UNIVERSITY OF CALIFORNIA,
IRVINE

Becoming Objects: IoT, the Archive, and the Transformation of the Human

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Informatics

by

John S. Seberger

Dissertation Committee:
Professor Geoffrey C. Bowker, Chair
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2019

DEDICATION

To:

Sara

and

Mom and **Dad**

and

in loving memory of **William Edward Seberger** (1981-2014).

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ACKNOWLEDGEMENTS

This is the sort of thing that calls for limits, else I'd go on and on. So, I'll begin with a quote from Moby Dick and let that set the parameters: "God keep me from ever completing anything. This whole book is but a draught—nay, but the draught of a draught. Oh, Time, Strength, Cash, and Patience!" (Melville, Moby Dick.)

Time and Strength

First and foremost, I would like to thank Geoffrey C. Bowker, my committee chair, for his patience, intellectual generosity, willingness to let me take risks, compassion, guidance, and friendship. We knew from the start, I think, that this dissertation would be a gamble. I was able to finish it largely because I knew your money was on me.

I would also like to thank the members of my committee, Peter Krapp, Simon Penny, and Josh Tanenbaum, who have provided invaluable insight into how to be successful scholars and people. (It goes without saying that you have guided my thinking in innumerable ways even if I don't cite you as often as I could.) If I ever manage to land a job, I will try to live up to your examples.

Cash

This work was made possible through the generosity of several people and institutions: The Intel Science and Technology Center for Social Computing; Mary Murphy-Hoye, Eve Schooler, and the Internet of Things Group at Intel; The UCI Department of Informatics Chair's Award; The Rob Kling Memorial Fellowship; and the US Department of Education Graduate Assistance in Areas of National Need (GAANN) Fellowship. I would also like to thank Herumi Baylon for her financial guidance and support.

Patience

I am deeply indebted to my department as a whole, The Department of Informatics in the Donald Bren School of Information and Computer Sciences at University of California, Irvine, for their continued support. I am particularly indebted to André Van Der Hoek, Melissa Mazmanian, Gillian Hayes, Yunan Chen, and Paul Dourish. Although our interactions were limited, you were ever-present on my screen in the form of email notifications or Facebook updates.

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Finally, to the grad students of the Informatics Department from 2012 to 2019 wherever you are now: thank you for the example you set in your fine work. You set a high standard—one against which I often compare myself.

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CM8.	**Seberger**, J. S. (2018). An Unseeable Grey: Ontological Implications of the Computer-Human Dialectic in the Internet of Things. "Opaque Media: A Workshop at UC Irvine," April 6-7, 2018.
CM7.	**Seberger**, J. S. & Bowker, G. (2018). Towards the Infrastructural Absurd. "Translating the Unbearable" University of California – Irvine, Department of Comparative Literature, March 1, 2018.
CM6.*	**Seberger**, J. S. (2018). The affordances of inscribed mediation: Troubling the subject/object dichotomy in knowledge production. Proceedings of A Body of

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CM5.* **Seberger**, J. S. (2015). How long is now? The 'digital' in DH. DH2015, June 29 – July 3, 2015. Sydney, Australia.

CM4.* **Seberger**, J. S. (2014). Generative troubling in emerging archival forms. DH2014, July 8-11, 2014. Lausanne, Switzerland.

CM3. **Seberger**, J. S., Echenique, A., & Lustig, C. (2013). Music for labs. Society for the Social Study of Science. October 9-12, 2013, San Diego, CA

CM2. **Sylvester**, N. M., Slota, S., & Seberger, J. S. (2013). Leveling the stage? Performance curation and embodied knowledge as knowledge infrastructure. Society for the Social Study of Science. October 9-12, 2013. San Diego, CA.

CM1.* **Seberger**, J. S., & Knobel, C. P (2013). Watching for whales: Emerging configurations of scholarly communication. *iConference 2013 Proceedings* (pp. 722-724).

Sonic Works

SW3. **Seberger**, J. S. (2014). Music for labs: Musical sonification of presence and absence at EVOKE Lab and Studio.

Arranged, compiled, recorded, and mixed using Logic Pro 9. The piece is comprised of found sounds, programmed MIDI instruments, and VST effects. All instruments programmed or played by John S. Seberger.

SW2. **Seberger**, J. S. (2012). "Kurtosis (music for page 1)" In C. Knobel, G. Bowker, R. Larsen, & J. Seberger(Eds.) Emerging configurations of knowledge expression: A digital report of a National Science Foundation workshop on "emerging configurations of the virtual and the real." Chicago, Il. March 20-12, 2011. NSF Grant #1042697. http://econfigs.ics.uci.edu

"Kurtosis (music for page 1)" is a programmatic piece of music that is structured according to the shape of a kurtotic bell curve. It was composed, arranged, recorded, and mixed using Logic Pro 9. The piece is comprised of found sounds, MIDI instruments and lap steel guitar. Legato violin parts were constructed from heavily edited found sounds derived from rehearsal tapes of the violinist Philip Roach. All other instruments programmed or played by John S. Seberger.

SW1. **Seberger**, J. S. (2012). "Insertion/deletion (music for page 7)" In C. Knobel, G. Bowker, R. Larsen, & J. Seberger (Eds.) Emerging configurations of knowledge expression: A digital report of a National Science Foundation workshop on "emerging configurations of the virtual and the real." Chicago, Il. March 20-12, 2011. NSF Grant #1042697. http://econfigs.ics.uci.edu/7.php

"Insertion/deletion (music for page 7)" is a programmatic piece of music, algorithmically composed to illustrate the effects of data insertion and deletion in biological and technological replication. It was composed, arranged, recorded, and mixed using Logic Pro 9. All pitch manipulation of found sounds was achieved using Celemony Melodyne. The piece is comprised of found sounds, MIDI instruments, and VST effects. Pizzicato violin parts were constructed from heavily manipulated found sounds derived from rehearsal tapes of the violinist Philip Roach. All instruments programmed or played by John S. Seberger.

Technical Reports

TR1. **Knobel**, C., Bowker, G., Larsen, R., & Seberger, J. (2012). Emerging configurations of knowledge expression: A digital report of a National Science Foundation workshop on "emerging configurations of the virtual and the real." Chicago, Il. March 20-12, 2011. NSF Grant #1042697.

Invited Talks

IT7. **de Bolla**, P., Jordheim, H., Warner, W., Bowker, G., Bender, J., & Seberger, J.S., &. (2018). RexDex & RexPro: Possibilities for Blockchain Technology in Representing the Provenance of Online News. Seventh Annual Re:Enlightenment Exchange (Praxis). April 5-8, 2018. Stanford University, Palo Alto, California.

IT6. **Seberger**, J. S. (2018). Scale, Enlightenment Mediation, and IoT. Seventh Annual Re:Enlightenment Exchange (Praxis). April 5-8, 2018. Stanford University, Palo Alto, California.

IT5. **Seberger**, J.S. (2018). Intellectual Generosity. Introduction to Geoffrey C. Bowker's Donald Bren Professorship of ICS Lecture. Donald Bren School of Information and Computer Science, University of California – Irvine.

IT4. **Seberger**, J.S. (2018). Introduction to the Social Analysis of Internet of Things. Guest lecture for IN4MATX 161. Donald Bren School of Information and Computer Science, University of California – Irvine. March 20, 2018.

IT3. **Seberger**, J. S. (2015). *Sapere aude* in a contemporary context. Fifth annual Re:Enlightenment exchange. May 17, 2015. University of Oslo, Oslo, Norway.

IT2. **Bowker**, G., Knobel, C., & Seberger, J. S. (2013). Emerging modes of knowledge expression. Annual meeting of the Western Humanities Alliance (WHA). November 1, 2013. San Diego, CA.

IT1. **Seberger**, J. S. (2013). Music for labs & Feverbook. Intel Science and Technology Center for Social Computing, University of California, Irvine, November 26, 2013. Irvine, CA.

Theses

T2. **Seberger**, J. S. (2019 [expected]). Expecting a Human: Into the Sociotechnical Imaginary of the Internet of Things. Doctoral Dissertation, University of California – Irvine. Irvine, CA.

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S3. Peer Reviewer for East Asian Science Technology and Society: An Internat'l Journal
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SM2. American Society for Information Science and Technology (ASIS&T) (2010-Present)
SM1. American Library Association (ALA) (2010-Present)

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ABSTRACT OF DISSERTATION

Becoming Objects: IoT, the Archive, and the Transformation of the Human

By

John S. Seberger

Doctor of Philosophy in Information and Computer Science

University of California, Irvine, 2019

Professor Geoffrey C. Bowker, Chair

Abstract

The human is transforming; the human is being transformed. This dissertation approaches the transformation of the human via the lenses of phenomenology, historiography, and media and critical theory, in order to identify the ontological status of the human transformed. It addresses and theorizes: (1) the transitional status of the human as subject-object chimera in terms of the emerging category of things that populate the Internet of Things (IoT); (2) the historiographical and epistemological assumptions of a post-IoT archive and their impacts on what it will mean to say, 'I am human.' Through the realization of the future-oriented imaginary of IoT, the human will know itself as a construction of objectivist reductionism: they will become objects.

1. Things are a gathering. The transformation of the human will occur, in part, as a result of a reconstellation of the subjects and objects that gather to produce things in the IoT: an ***n***-adic mode

of thinging. The evidenced reconstellation and expansion of the subject-object dyad that comprises the thing implies an ontological shift: the membrane that once separated the biune categories of subject and object expands to create a liminal space in which subject-object chimeras emerge. The biune becomes triune. The result is a human that knows itself as a subjectivity through the reductionist dissociation of objectivist, data-driven information extraction.

2. The rise of the subject-object chimera implies an archival duplication; it evidences widespread discursive transformation such as one might expect at the emergence of a new historical *a priori* condition, a new era. This duplication shines further, materialist light on the emergence of what Bowker referred to as the Age of Potential Memory. Through duplication—wherein the liminal space that divides becomes a phenomenological space unto itself in which the human resides between two archives—traditional dichotomies of subjects and objects, extensions and prostheses, humans and posthumans, come into question. Through reverse anthropomorphosis, the human will come to know itself, *post hoc*, as a subject only through the reflection provided by the objects with which they couple to produce things.

Foreword

The archive is irreducible. It is the historical set from which histories and imaginaries, trajectories and linearities may be drawn. But any one of these is only representative of those archived statements used to construct it. One might indeed tie a thread to connect multiple statements or events in order to make sense of them—to create a narrative, a history—but no such thread can be tied between all points of the archive and achieve the same effect of linear narrativity. A thread that touches all points would be a territory not a map; it would be the archive not an historical *a priori* condition.

In choosing to focus this work on the possibility of, and evidence for, discursive transformation within the archive—particularly the discourse of the human as it occurs in the context of the Internet of Things—I am necessarily engaging in a process of knot tying rather than creating a linear thread. In its form and content, this dissertation describes my process of coming to understand the knot—to identify its various twists, turns, points of friction, and the possible transformations it might undergo.

Any treatment of the theory of *the* archive must itself be grounded in *an* archive, which itself must be evidentiary: the archive must be accessible in the form of materialities, substrates, documents. The Internet of Things presents as a suitable site for understanding the archive not only because it is an area of study that generates countless vernacular and academic artifacts, but because these artifacts are somehow different than others: IoT is nascent, and therefore likely to present evidence of discursive transformation, if as Foucault suggested, discursive transformation is the motor powering the shift from one set of historical *a priori* conditions to another; IoT is grounded in deeply heterogeneous textuality, by which I mean the 'texts' that comprise the archives of IoT extend beyond the usual borders of language and image and into the realm of

mediated and mediating objects; and the rhetoric of IoT hints at a fundamentally changed set of human futures wherein all is convenient and efficient without paying much attention at all to the potential ontological and epistemological effects that IoT may have on the experience of being human.

Two short excerpts from the work of Jacques Derrida will illustrate the archival import of IoT:

> (1) The archivization produces as much as it records the event.
> (Derrida, 1998, p. 17)

> (2) […] the technical structure of the archiving archive also determines the structure of the archivable content even in its very coming into existence and in its relationship to the future.
> (Derrida, 1998, p. 17).

That archivization produces as much as it records speaks directly to the data-centric epistemic culture that gives rise to IoT. It can be likened to Johanna Drucker's concept of 'capta' (Drucker, 2014): a reframing of data collection that emphasizes it as a generative action. One cannot collect data without already producing the form of data to be collected; in so producing the data's form, the data collector reduces the world in which data reside not as data but wildly as phenomena, into a prosthetic representation of itself.

This feedback loop between the phenomenal and the data-extractive, as posited in the second excerpt from Derrida, shapes present tense conceptualizations of the future, as well as the future itself. IoT then, as data-extractive and prescriptive, not only shapes the present tense of its users—human experience as it is spread out along the spectrum of the subjective and objective—but also guides the formulation of possible futures: it is a site of discursive transformation, where the discourses in question are those of the human and the thing.

The scholarly work pertaining to IoT is, for the most part, absent of critique, non-technical theorization, and considerations of that component of things that always already predicates the

existence of a useful object: the human. In this dissertation, an exploration of the theory of the archive serves as a lens by which to simultaneously explore the discursive components of IoT; reciprocally, an exploration of the discourses comprising IoT allows for evidence-based theorization of the archive in a novel way, one that moves the Foucauldian and Derridean notions of the archive into the realm of lived experience, the tactile, the perceptive, the affordance-based.[1] Thusly, the archive moves from the conceptual realm of intellectual history to the phenomenological world of the human: a world that is summarized through the overlap of such terms of art as the *umwelt* (Von Uexküll, 2009), the *lebenswelt* (Husserl, 1970), the *habitus* (Bourdieu, 1977), and *habitèle* (Boullier, 2014).[2] In so moving, it overlaps with infrastructure broadly construed: the naturalization of artificial amendments made to the human's environment, but always already based on the characteristics of human embodiment. The archive extends from the human; it is embodied through the human and the discourse of the human concretized through it.

Insofar as the statements that limn the imaginary of IoT point forward into the future, they are also tethered to the past. They are bound up by the cultural-historical milieu of the archive they promise to regenerate, transform. Yes, this archive contains statements and events, objects and ideas that in various constellations point to potential futures, potential reconstellations and topological transformations of the discourses that constitute the archive. But these potential futures

[1] It is not the goal of the present work to reconcile the archival theories of Foucault and Derrida. They are incommensurable. It is, however, one goal of this work to continue the dialog between the two. Both are useful in certain scenarios; neither should be forgotten. While I find much that is worthwhile in the theory presented by Foucault, I consider myself more of a Derridean than a Foucauldian, but I do not use either of these terms to wholly define my work.

[2] Each of these terms—although borrowed from different disciplines—refers to aspects of the lived world of an animal or cognizing actant. In referring to them *en masse*, it is my goal to highlight the extent to which they overlap in the context of historiography and archival studies: in providing these terms as a constellation, rather than as individual units, I aim to imply the role of not only concepts, but of embodiment, perception, and temporality in the construction of the archive. Just as Derrida highlighted the need for externality in order to birth the notion of internality (Derrida, 1998), I highlight the subtending role that the human condition of embodiment plays in the creation and possibility of an archive that reaches beyond pages and documents.

are always already under the influence of broader archival forces: discourses that have constituted the archive-in-motion for as long as substrates have borne inscriptions; the archive as meta-discourse.

If IoT is archival—and it is grounded in human and material history, therefore it must be archival—it can be understood through identification and analysis of the discourses that subtend it. The trajectory of these discourses and their changing constellations can then be inferred through a process of speculative deduction. If it is possible to infer mechanisms of discursive transformation through speculative deduction, then it is also possible to argue for the broader usefulness of archive theory: Foucault was either uninterested in or unwilling to identify the mechanisms by which discursive transformation occurs; the archival forces theorized by Derrida pertained only to the Freudian archive. What is needed here is an amendment of archival theory by reconciliation: a bridge between the phenomenological archive of Derrida and the structuralist archive of Foucault, but a bridge that does not unify. At a point in time when computation and computational power characterizes the brunt of scholarly knowledge production, a re-introduction of archive theory and its relevance is much needed.

It has been suggested that scientists are divided into two categories: lumpers and splitters (Rosenbloom, 2012). Lumpers tend to consolidate disciplinary knowledge into a state of transdisciplinarity (Cetina, 1991, 1999; Knorr-Cetina, 1981; Nowotny, 2005), foregoing the professional reductionism of disciplinary silos in hopes of achieving a greater or more holistic understanding of a phenomenon; splitters engage in the opposite activity, creating ever more specific and specialized niches—mediating armatures through which or from which phenomena

can be evermore divided into unique occurrences from, say, skin to cell to molecule to atom to sub-atomic particle.

As a knowledge producing species—one with an explicit archive that extends from the present tense of experience across temporalities—humans have made incredible progress through processes of splitting. As I will argue in this dissertation, however, the blanket usefulness of ever-increasing specificity is reaching its end. At the very least we are constructing a new historical *a priori* condition in which epistemologies must be considered as case-specific: therefore, it becomes necessary to consider emergent sociotechnical systems in terms of multiple (and possibly conflicting) epistemologies, where each approach is equally valid under certain conditions.[3]

The study of infrastructure—the study of the sociotechnical, the temporality of media both visible and invisible up to and including the human state of embodiment—broadly falls into the former category. So, too, must the study of the overlap between the archive as intellectual-historical construct and experiential, phenomenological realm. Insofar as infrastructure subtends, it is something that is reciprocally built upon: the archive is the ultimate infrastructure. It is pre-infrastructural, proto-infrastructural. To describe an infrastructure in a rich way requires concurrent description of, and familiarity with, those structures built upon it and those upon which it is also built. Rich description, then, requires a broad familiarity with both social and technical phenomena. Given my own predilection for the both structuralism and phenomenology, I see no

[3] In Chapter Three, I provide an explication and analysis of Bruno Latour's famous argument pertaining to the validity of critique as opposed to matters of concern. I extend this argument to suggest that matters of concern replace matters of fact, such that facts are possibly viewed from multiple vantages, each of which present their own conditions of validity. Factual concerns become ethical concerns: the things of IoT, whether interpreted through the lenses of human extensions or prostheses, are not ontologically either, but both. Once both approaches are interpreted as valid, it becomes a question of ethics as to which approach should arise as the dominant approach. I maintain that there is more overlap between these approaches than has been acknowledged: whether seen through the lens of extension or prosthesis, the objects with which we couple to produce things are as fundamentally mediating as language and image: all that is mediated is phenomenal; all that is phenomenal is ultimately correlationist. What is required of the realization of the relative validity of these two approaches is rhetorical: to see the central place of the human-as-agentic in the construction of futures.

better theoretical construct than that of the archive through which to view a set of heterogeneous phenomena that stretch across categories of time, the social and the technical, the natural and the artificial, the real and the virtual.

A similar dialectic arises with regard to processes of sense making: just as there are lumpers and splitters in science, there is linearity and there is non-linearity in sense making. Where others may want to see a line—to reduce the archive to a linear set of statements—I tend to see the various knots that the thread might make. This, I think, is a symptom derived from multi-disciplinary training. But I'm not alone in this approach: as Donna Haraway has noted, the world is a knot in motion (Haraway, 2016). The archive is not a string of neatly arranged Christmas lights lining the Griswald family rooftop, but the messy jumble of cords and bulbs removed from a box in the garage and fobbed off on an unwilling Rusty. In analyzing this knot, one engages in the process of attempting to mentally untangle it without doing damage. This process leads to some challenging theoretical environments:

> When Karl Jaspers, revealing the impossibility of constituting the world as a unity, exclaims: 'This limitation leads me to myself, where I can no longer withdraw behind and objective point of view that I am merely representing, where neither I nor myself nor the existence of others can any longer become an object for me,' he is evoking after many others those waterless deserts where thought reaches its confines. […] The real effort is to stay there, rather, in so far as that is possible, and to examine closely the odd vegetation of those distant regions.
>
> (Camus, 2012)

Many an odd specimen of discursive flora and fauna populate the desert terrain of the in-between, of the liminal. The map depicting the conceptual space between the line and the knot—between the holistic archive and reductive statements—is largely blank, populated and punctuated like early modern sea charts with, 'Here be monsters.' Insofar as this work reaches beyond the boundaries of informatics—whatever that is—it is intended as a sort of zoology of these monsters, their potentials, their evolutions, their hopefulness (Law, 1991) bordering on the absurd. This

zoology presents as a study of the liminal: the space between the known archive and the future historical *a priori* condition that will emerge from it, through it. Based on the findings of this work, it is also a study of the liminal in another sense: a study of the experience of living as a human in between two archival states.

Derrida has done much work on liminality. He most clearly approaches the topic through the notion of 'spectrality':

> What is the time and what is the history of a specter? Is there a present of the specter? Are its comings and goings ordered according to the linear succession of a before and an after, between a present-past, a present-present, and a present-future? […] If there is something like spectrality, there are reasons to doubt this reassuring order of presents and, especially, the border between the present, the actual or present reality of the present, and everything that can be opposed to absence, non-presence, non-effectivity, inactuality, virtuality, or even the simulacrum in general…"
>
> (Derrida, 2006, p.48)

Again, one cannot reduce the archive to anything but itself, and therefore the possibilities it entails. Although a neatly unfurled thread is not fundamentally or materially different from any knot it may form—if uncut, the thread exists as potential knots just as a toroid might readily be transformed into a coffee cup by means of topological transformation—it is *experientially* different. The liminality in question here is one of the space between the line and the knot; the conceptual space between the archive and the potential future historical *a priori* conditions to which it might give rise through processes of discursive transformation. As such, primary focus is given to potentials and arguments rather than predictions and declarations.

The creation of a linear thread connecting points of the archive risks tethering a future world of potentials, optimistic and relatively unbounded, to bits of data, the strobing optimism of

creativity to the capta (Drucker, 2014) of a lateral, cleaned, and reinvented past. These processes reduce the artifactually rich world of bodies and things and the affordances that bind them together in the gathering of things to phenomena that are always already characterized by notions of validity and generalizability.

The act of reducing the archive to descriptive linearities is both destructive and creative: it destroys possible futures in the act of projecting and therefore creates a stable future, an outcome. The work that follows is not an exercise in destructive prediction. Rather, it is intended to highlight the realm of the spectral, the non-absent-or-present, the imagined; it highlights the potential futures that might arise from the current state of the archive: a state of transition wherein the ontological status of the human is unstable by way of the role humans play in co-constructing the things of IoT. In being a study of the liminality of the future—the specter of futures possible—this dissertation is an exploration rather than a declaration: it is the identification of possible ontological, epistemological, and phenomenological terra nova, not an attempt to claim that new land in the name of any one extant theoretical framework. In seeking to identify future meanings latent in the statement, 'I am human,' (as bounded by the Internet of Things) it is an attempt to identify possible novel theoretical frameworks that move beyond the traditional dichotomies of subject and object, human and posthuman, extensions and prostheses.

I conclude this foreword now with a beginning. In creating a thread to guide the reader through my work—a linear textual thread about the complexity of the archival knot—I hope to conjure the spectrality of the space between a line and a knot: the spectrality of two archives, two eras overlapping, and a future historical *a priori* condition in which the archive is duplicated into subjective and objective forms. In creating a thread that describes the process by which I have come to understand IoT as a set of phenomena undergirded by discourses that stretch into the realm

of the physical and the material, from the past into the future through the present, it is my goal to identify IoT's possible, potential futures—its impact(s) on the process of mundane living.

In words I have heard attributed to Derrida, this dissertation is an exercise in 'letting ghosts speak' through the inferential processes of reading (both close and distant), interaction, interpretation, and speculative deduction. I hope to let them speak clearly.

Chapter One: Introduction

1.1 Introduction

Writing about the Internet of Things (IoT) often seems, in the words of John Lennon and Harry Nilsson, 'like trying to shovel smoke with a pitchfork in the wind.' This is perhaps the case because I write as a humanist, not a technologist: my goal is to account for the human within the Internet of Things. As we will see, the human is conspicuously absent from operationalizations of IoT. Thus writing about IoT from the vantage of the human is an activity fraught with false starts and deceptive progress, particularly when the focus of description is not simply the technical as isolated from the social—If you build it, they will come: *Veritas ex data*! Damn the torpedoes!—but rather the sociotechnical. All the more so when one is not seeking to merely describe the present or the past, but the links between the past, present and potential futures that IoT represents. Mine is, within the context of this dissertation, a question of human futures—potential discursive transformations of 'the human.' It is therefore a question of the relationship between the archive and human embodiment—an embodiment that is intrinsically tied to the gathering of the subject and the object to construct things and thereby take action in the world.

Given my focus on the human futures implicit in the imaginary of IoT, I will present a definition of IoT presently so as to identify those aspects of IoT which will not receive coverage here: the Internet of Things (IoT) refers to the extension of the Internet into objects not previously associated with the Internet; through the computerization of everyday objects, IoT expands the set of networks that is The Internet to include objects in the 'real world.' Where once formal computers (e.g., desktops, laptops) were the only point of entry to the Internet, now IoT constitutes an imaginary—already partly realized—wherein everyday objects (e.g., wristwatches, coffee makers,

automobiles, traffic lights) are Internet-connected.[4] The map of The Internet comes to redefine the territory of the lived world.

Within this imaginary of ubiquitous connectivity, one sees the possibility for new modes of communication. Object-to-object communication is perhaps the most apparent of these forms. This form of communication will receive very little coverage in the work that follows.[5] Instead, my focus is on the role of the human in IoT. As I will demonstrate in Chapter Two, the role of the human—its futures, the potential meanings that arise from the future statement of, 'I am human'—is unclear in IoT. In order to begin approaching a systematic understanding of the human in the futures of IoT, it becomes necessary to focus on the human rather than on the objects that most clearly present as the 'things' of IoT.

This is the kind of task best suited to informaticians, media scholars, historiographers, critical theorists and the more patient in-groups of the social sciences. Qualitative interpretation is a must: to uncritically begin from a point of quantitative analysis is to give up the game, to buy into the very overarching (and ill-defined) assumptions of data supremacy that visions of IoT contain within themselves, and on which they are predicated. So, then, this is an exercise in exploration: basic (human) science as it unfurls in the realm of the qualitative. As such, the work contained in this dissertation is written with a few scholarly populations in mind. But, given the inter-, and more accurately, transdisciplinary nature of this project, it is not addressed to any one well-defined group. It is rather addressed to those at the edges between media studies and historiography, HCI and phenomenology, information science and the digital humanities.[6]

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[4] As I argue in Chapter Five, it is no stretch of the imagination to see that the expansion of The Internet into the daily world of objects implies a pervasive computerized empiricism wherein all objects connected to The Internet also serve as points of data collection and therefore knowledge production.

[5] It will, however, receive implicit coverage at the point at which I demonstrate the objectifying effects of IoT on human subjectivity: where the human becomes an objectivized subject, all communication potentially falls under the category of object-to-object.

[6] Because of the broad terrain covered herein, I attempt to provide definitions of all terms-of-art in an approachable

These particular populations of scholars and the broad methodological toolkits of qualitative inquiry come to mind because IoT is too often framed as a technical set of phenomena: because of the commonality of this framing, it is my intent to explore IoT from the vantage of the historical, the archival, the social, and the phenomenological. IoT, in being all of these things, is a sociotechnical imaginary. To study this sociotechnical imaginary, it is necessary to study that which allows the emergence of the imaginary: the human condition of embodiment from which the imaginary stems.

By way of a metaphor: IoT (like Big Data before it, or the rush to append the term 'cyber' to all things Internet-related prior to the 2000s) is a map that implicitly does not match the terrain it represents; it is a way of seeing the world *as it might be*, but filtered through the media formats that define our present. But it is also a hopeful map of future terrains if it is read closely enough: a map that shapes the terrain to it; a map that seeks to change not only the territory it represents, but the means by which that territory is represented.

I approach IoT as a an implicit map of how we approach the future by means of the present tense; a real-time 'just so' story that assures us we are making progress and gives its users and adherents a sense of purpose and belonging, a justification for otherwise odd behaviors like relying on a robot to vacuum one's living room, or a smart phone to tell you the best route to get to Dodger Stadium for a Friday night game.

Treatments of IoT ranging from marketing pieces, tweets, packaging, and scholarly essays comprise the data for a cartography of the changes we might make to our worlds, to the archive in which we live stretched out across time and historicity, but always in a present tense; a map of what our terrains—epistemological, ontological, and phenomenological—will look like when, one

fashion. Where this is not permittable for reasons of readability, I provide citations and references such that the reader might explore these terms in the context of the works in which they first emerged.

fine day, we manage like Ouroboros to catch our tails and swallow: to come full circle into a realization of our imaginary futures full of successes, failures, wicked problems, irrational humanity, absurdity, and emergences, all bound up in IoT-enabled devices.

So, IoT straddles the present and future tenses—it is an expectation, a technotale (to borrow a term from Genevieve Bell and Paul Dourish [2007]) unfolding at the level of a potential infrastructure.[7] But the protagonist in this technotale is not always apparent. The three-word phrase, 'Internet of Things' is as opaque as any I've encountered. When housed in a School of Information and Computer Sciences, as I am, it is almost too tempting to approach the study of IoT from the vantage of the Internet. That, after all, is the shiniest word in the phrase. But such an approach would be a mistake. (It would also be redundant.)

Given that IoT is about 'things'—it is the Internet *of* them, after all—to study IoT is not necessarily to study the Internet. It is to study the effect of networking and connectivity on the concept of 'things,' the possible transformations of ephemeral subject-object relationships (for things, as we will see in Chapter Two, are always already a gathering), the archival nature of the imaginaries and expectations that arise from those subject-object relationships, and the evolution of hopeful monsters (Law, 1991) as they grow to impact the very process of mundane knowledge production, of being-in-the-world in a day-to-day way. It is to study a particular set of potential futures—potential historical *a priori* conditions—wherein the very nature of what it means to be a 'human' is subject to (and the object of) discursive transformation. As I will argue in what follows: Things just aren't what they used to be—and neither are people.

[7] I approach infrastructure here and throughout this work as naturalized systems, either natural or artificial [Simon, 1996], that shape the way daily lives are lived; that allow, in an ablative sense, for the production of daily knowledge 'by means of' their naturalization and the naturalization of how we understand them.

At the present time, roughly twenty years after the term 'Internet of Things' was coined by Kevin Ashton (see Ashton, 2009) during a presentation at Proctor and Gamble, the study of IoT as a broad phenomenon comprised of conceptually separable but intrinsically linked phenomena, must be a study of transformation. The imaginary of IoT is rife with the assumption—likely a valid assumption—that IoT will change the world. In that it will change the world by coming into being, not only is the discursive structure of the future world (a future, as yet unrealized historical *a priori* condition) uncertain, but it wraps with its uncertainty the very force that will effect its structure: IoT.

Although there is enough of a 'there' there—the term 'IoT' elicits images of certain smart objects or environments, as well as certain departments on campuses and boardrooms in industry—the placeness to which IoT is tethered is necessarily a place defined by change. Rather, its placeness *is* change, *is* transformation. So, the study of IoT must similarly, but paradoxically, be the study of a snapshot in time: a moment when a particular imaginary of IoT can be identified, isolated, and analyzed such that the potential discursive transformations within it—the possible futures it emanates—can be speculatively deduced. To study change is to study a moment of observable or inferable change. It is then, as I will describe and define in Chapter Four, a study of the long present tense: the temporal set that includes past and future as it plays out within the rhythm of a generation, an individual life.

Would that this transformation were a process previously documented, attached to known and validated means of observation and measurement. But this is simply not the case. Even Foucault in all his virtuosic, archaeological system building did not account for the mechanism by which discursive transformation occurs. Surely his early career, and in general his historiographical

project, focused on the identification of disjuncts between one epoch and another. But in doing so, his project put the means of transformation—but not transformations themselves—out of focus.

And yet, that is precisely the goal of this work: to leverage multiple approaches to the analysis of discourses as they present across various media formats, each carrying messages or representations about a future world characterized by IoT, in order to infer the *means by which* materiality (the impending smartness of objects!) impacts and effects the construction or emergence of a new historical *a priori* in which humans will still have to live *as humans* amidst a growing network of massively interconnected objects. This project addresses how the materiality of inscriptive objects impacts the archive of possible statements in which one resides, bounded by the rhythms and duration of their own life, and the extent to which the discourse of 'the human' might be transformed.

In what follows, I identify interactions between subjects (*users*) and objects (*useds*) as one site and mechanism of discursive transformation: a feedback loop between subject and object is created through the use of IoT-enabled devices; this feedback loop potentiates a form of perpetual motion in which the subject-user relays between their own subjective experience and the objective representations of those experiences that are produced through data collection and representation.[8] The human subject thusly becomes both subject and object: acting upon their IoT-enabled devices, and acted upon by the data those devices extract, synthesize, and re-present in the form of information. The forecasted effect of this feedback loop is one of transformation: a transformation of the discourse of the human, wherein the human concretizes as a subject-object chimera: an actant caught in a feedback loop between experience and representation. The arrival of a new, matured historical *a priori* will be achieved when either this chimerical state becomes concretized,

[8] Later in this work, I will frame this relay in terms of the Flusserian notion of the technical image.

or (as I think is more likely), the human exceeds the liminal state of the chimera and is wholly identified as an object created through the reductionist objectivism of data extraction and analysis.[9]

To approach IoT as a discursive construction—or rather the result of a particular constellation of discourses and a point on a trajectory—is to position users of IoT, as well as IoT devices, within a real-time, contemporary archive. We simply do not have the historical luxury of studying IoT as a set of discourses from the remove of centuries of paper. To study IoT as a discursive constellation, then, is to assert that either the archive is not merely an historical construct accessible through Ranke-like analysis of historical documents, or that, in being an historical construct, the very notion of history laps at the present tense like waves against a coast: to argue that we live in an archive, and by means of living in it, render the archive accessible in the present tense. I will argue for this second approach, which is more Derridean than Foucauldian. We live in, co-constitute, and are surrounded by the archive: it passes through us like air in the lungs, traversing the skin, but apparently beginning and ending with the sensations of the skin. We gain access to it by the mere act of waking up and taking action in our daily lives. Through actions with, by means of, and on objects, we engage with the archive in our every lived moment.

Such a framing plucks Foucauldian and Derridean theories of the archive out from the realm of the historical and theoretical and ports them into the realm of the world, of experience, of the phenomenological. It brings us to the precipice of an admission, a confession that confounds: we are at once wanderers and wayfarers, *flaneurs* and embodied (sociotechnically embedded) ambitions, but we are simultaneously each of these things in relation to a given set of possibilities

[9] This is a forecast grounded in Derridean archival theory: the human will perpetuate itself, and therefore its archive, by doing violence to itself in the form of reductionism: we will know (and therefore control) ourselves by effecting an ontological discursive transformation wherein we will become our own objects.

that are embodied in-part in the infrastructures we receive through the thrownness of being born in a certain time and place and a certain body; in the physical and naturalized instantiations of power, knowledge, organization, and communication that define a society-in-time. The archive, then, might be characterized as a set of path dependencies—albeit a set that is functionally unknowable, but theoretically finite.

This admittance, stated differently is: We live within an archive that we change by means of living within the archive, but our means of living—the actions we might take—are path dependent on extant archival conditions. (In Derridean terms, we are both the archons that govern the archive and the violence that perpetuates it [Derrida, 1998].) We might infer from this statement that we also live within constraints as harsh and creative as those that bind the creation of a fugue or a sestina: a definable historical *a priori*, which is itself a worldly and sociotechnical manifestation of (more or less) durable discursive constellations within a greater archive where some statements are possible and some impossible but for the possibility of discursive transformation.[10]

If we live in an archive and we make sense of the world in our day-to-day lives by inscriptive and actionable reference to this archive—unavoidable as it is, being inscribed upon us and our environments by cables, streets, buildings, infrastructures—then the point at which the archive meets daily action presents as the imaginary:[11] a set of (latent or explicit) explanations and motivating forces that give us a sense of purpose within a greater historicity; that give us a shared, but suitably variable, modus operandi for living the way we do amidst centuries of water, wires, paper, and data. In this light, the imaginary functions as a pivot between the historical *a priori* that

[10] I have now used 'we' enough without operationalization to warrant one: 'we' refers loosely to contemporary Western society; essentially to a group of users that can be arranged and defined by their engagement with technology, for which the possession of a 'smart' device can be used as a proxy variable. A more detailed operationalization of 'the human' will be included in Chapter Two of this dissertation.

[11] A more detailed discussion of the social imaginary will be presented later. Suffice to say, for the moment, that I rely on Charles Taylor's (2004) approach to the imaginary.

is and potential discursive transformations that will may give rise to other historical *a priori* conditions: it is the point where the past meets the future not in terms of temporality, but in terms of statements, events, and possibilities.

In summation, this work is an attempt to: (1) identify and define not only the mechanisms by which our current epoch transforms into a future historical *a priori* as seen through the lens of the statement, 'I am human,' but also an attempt to understand the ways in which this future historical *a priori* is engendered in and by certain media formats (and therefore the gathering of things); and (2) to forecast, based on various forms of inference, what the future meanings of the statement, 'I am human,' might be as a result of the emergence of a new class of things. It is an attempt to elucidate the relationship between the archive (material and conceptual history, both dead and living, and its path dependencies), the present tense (a set of imaginaries where discourses meet potentials by means of material interactions), and the futures in which we so readily set ourselves afloat without fear of drowning—all of which are bound into cohesion by the gathering of things.

1.2 Material Transformations: Subjects and Objects (and the Human)

From the Internet of Ships and the Port of Long Beach to smart cities and smart homes to teledildonics and behavior tracking, the very nature of the subject-object relationship that generally constitutes a *thing* comes into question by way of insidious transformation. Sometimes this transformation occurs via the folding of the distal into the proximal as in the case of a sex toy manipulated by a distant lover or webcam-John. Other times, it takes the form of postal deliveries in Southern California being monitored from a flat in Sydney across the Pacific. In a specific way, then, part of the transformation that IoT imposes on 'things' is one of distance (and therefore temporality).

Subjects and objects no longer need to be proximal in order to couple to give rise to 'things.' While this has been the case in some form or another since at least the first semaphore network in eighteenth and nineteenth century France, it would be an error to assume too much similarity: IoT is predicated on a connectivity several orders of magnitude greater—one that has both broader and deeper phenomenological, ontological, and epistemological implications. Moreover, the connectivity of IoT surpasses the postal example above and arrives at the example of digital sex work because IoT is (ostensibly) not about representations of thing, but about the things themselves. An IoT-enabled device is not an image of itself; it comes into being by virtue of the built-in sensors and actuators and transmitters that make it IoT-enabled.[12] If these are some of the ways that 'things' change, and the human *is a human* by means of their interaction with historically-grounded worldly objects, then we might begin by supposing that the discourse of 'the human' in IoT is subject to different operationalizations of embodiment, if to be embodied is to be situated within a certain spatial and temporal matrix characterized not only by these two axes, but by the sensory-perceptual abilities born of innate (or durably coupled) mechanisms—something approaching an *umwelt* (Von Uexküll, 2009), but an *umwelt* that arises alongside the human's technological *habitèle* (Boullier, 2014).[13]

In a broader sense, the IoT's transformation of 'things'—which is always already a transformation of the human, if the human constitutes the subject that couples with an object to

[12] As I will argue over the course of this work, the IoT-enabled object does, however, create images of the things is measures. These images derived from IoT-enabled objects constitute the primary point of interaction between the human user and the object-used.

[13] The concept of '*umwelt'* can be summarized as that of the lifeworld. It refers to a mode of existence that arises between an animal and its environment as a result of complementary characteristics of both. The human umwelt, therefore, is the mode of living to which the human has access as a result of their sensory and perceptual abilities in relation to the environment in which they reside—an environment that is co-constituted by their sensory and perceptual abilities. The *habitèle*, on the other hand, refers to the physical manifestation of cultural capital: the two overlap here because physically instantiated cultural capital (in the form of technologies now imbued with prosthetic or extensional sensory or perceptual abilities) changes the means by which the human can interact with their world.

constitute a 'thing'—takes the form of a change in the number and visibility of subjects that interact by means of a shared object, as in the case of any device that collects data from a user (Subject A) and shares that data in one form or another with corporations, data scientists, institutions, and marketing firms (Subjects B through *i*). This transformation is further complicated when the data collected by sensor-endowed objects is considered an object unto itself, stored neither in the object itself nor in the mind of the user.

To illustrate, consider the example of WeVibe. WeVibe is a trademarked, corporate subsidiary of the Canada-based Standard Innovation Corporation, which received its Canadian certificate of incorporation in July 2004. Standard Innovation Corporation is a complicated one, as it is run by a core party of three. Two individuals are based in Germany; the other in Ontario, Canada. (This is relevant, as we will see, because it alludes to the breadth of the corporation's physical presence.) The first use of the WeVibe trademark occurred in 2007: at this time, it identified goods and services provided as 'Adult sexual aids, namely, vibrators.' (NB: to further demonstrate the complicated nature, if not outright complexity, of this corporation, its trademark is filed under category 010 of the International Classification: "Surgical, medical, dental and veterinary apparatuses and instruments, artificial limbs, eyes, and teeth; orthopedic articles; suture materials.)

Frankly, Standard Innovation Corp. (SIC) makes the sort of thing one might expect from the unlabeled-brown-package-like name of 'Standard Innovation Corporation.' The majority of its subsidiaries and trademarks produce or refer to sex toys. What makes SIC stand out is its early adoption of an IoT framework. WeVibe products, for instance, ire described as follows: "The We-Vibe product line includes a number of Bluetooth-enabled vibrators that, when liked to the 'We-Connect' app, can be controlled from a smartphone. It allows a user to vary rhythms, patterns and

setting — or give a partner, in the other room or anywhere in the world, control of the device." (Domonoske, 2017)

Another aspect of WeVibe that makes it stand out from the pack of sextech companies in existence is the fact that it was sued for the way it shared data. Very personal data. In a lawsuit filed in federal court in the state of Illinois—a lawsuit which was settled in favor of the plaintiff—anonymous plaintiffs claimed that the WeConnect app collected and disseminated data pertaining to frequency of use and vibrator settings. What's more, this metadata was linked with customer email addresses thereby rendering this metadata descriptive of a given, identifiable individual.

In this 'ripped from the headlines' example, we begin to see just how the composition of 'things' is changing. On the one hand, a thing—the vibrator—is comprised of the user and the object. (Without the user, the vibrator isn't a vibrator, but just an object that vibrates.) On the other hand, the 'thingness' of the vibrator extends far beyond the bedroom: there are hidden actants additionally coupled with the dyadic 'vibrator.' These include the database in which these data were stored; the articles of Incorporation that define SCI; and, by proxy, all individuals who are deemed by contract members of that corporation. In many ways, this is not so much an IoT-enabled *ménage-à-trois*, but an outright data driven orgy—one where the majority of participants were not explicitly invited but were no less active in the network of this particular form of connectivity.[14]

Still another form of transformation—perhaps the hardest to account for—occurs at cognitive and perceptual levels: the objects that populate our environments wield deep influence over the sense that we make of the world in the form of action, and indeed the ways in which we are *able* to make sense-action *in-situ,* ostensibly prior to the act of linearizing such sense in the form of

[14] As I will argue later in Part II of this dissertation, IoT's transformation of 'things' also implies a dissolution of the categorical membrane that separates the subject from the object: it will give rise to chimerical subject/object hybrids. In the case of WeVibe, the great network of actants evidenced this dissolution by literal penetration.

durable (archival) inscription. This is not only because these objects comprise the world in which we live, but also because the set of actionable potentials that arise between a subject and an object dictate just what can be done in the context of a given environment—they and the means by which we couple with them *are* the environment.

Although these couplings and the actionable knowledge to which they give rise always already occur in a present tense, the production of durable or temporally stable knowledge from such couplings (i.e., what Bertrand Russel called 'knowledge by description' [Russell, 1951]) occurs by way of translation: an archiving, a translation of the present tense (or recent past) into something carrying itself into future present tenses by way of an inscriptive substrate such as paper, stone, silicon, or other objects with which we interact. It is for this reason that any attempt to describe the discourses that underlie the imaginary of IoT and the extent to which they transform as a result of the realization of a ubiquitous IoT must be accompanied by a theorization of the archive to which IoT belongs—the archive it both instantiates and potentiates, creates.

The form of an object impacts the form of the archive because the archive arises from the possible interactions between the embodied human subject and external objects; the form of the archive is always already tied to the set of possible statements derived from such an archive. This need not be read as purely theoretical as it sounds: Arlette Farge deftly covered this terrain in her phenomenological consideration of working in archives (Farge, Scott-Railton, & Davis, 2013). To be in an archives, the traditional kind comprised of dust and documents, is to immerse oneself in the historical-narrative possibility of those objects and their semantic contents. It is the smell of the dusty tome, the weight of the reading room chair, the light from the high windows pouring over a page. (Increasingly, it is the weight of the screen, the smartphone's sleekness and shine.) To be in an archive is to be alongside the time and information those objects carry and—assuming

artifactual richness beyond one homogenous type and document format—to see, *post hoc*, the transformation of the archive across time.

But the phenomenology of archives and archival materials extends beyond ambiance. Different materialities carry narrative and meaning in different ways. Film is not the same as text; text is not the same as an interactive app; the map is not the same as the territory. Different media formats communicate, however subtly, different visions of the future, each of which is bound by the types of interaction afforded by a given format.

The subject-object couplings of the present tense surely give rise to data about the present tense, but they also give rise to sets of potentials—expectations for other forms of future couplings, a realm of possible affordances and the infrastructures that define that expected realm. To lose oneself in the allure of the archive is to look simultaneously at the past through the present tense, but also to imagine, to abduce and then speculatively deduce, the futures of the archive itself: the shape of things to come and the physical, discursive limitations of information those things will carry.

The nature of knowledge production—and therefore the nature of being—within this expected realm is necessarily shaped by the constellation of subjects and objects that gather to form a *thing*. The boundaries of knowledge are shaped by the relationship between the subject(s) and the object(s) that interact within the archive; that co-constitute the things and events that themselves constitute the archive of possible statements. When the archive is operationalized as a greater realm than one purely containing archival documents, but rather as the world in which we are daily immersed full of acceptable limitations and cultural boundaries, then an always already condition arises: we are in and alongside the archive of our societies and cultures, with their norms and practices and materials, but we also co-constitute such an archive with our own physicality, the

object-components of our 'selves'. In studying the potential archive(s) that arises from IoT, this is a study of the archive-in-motion focused on the motion itself, the motion of the interaction between subjects and objects in the gathering of things.

1.3 The Gathering of Things

While the etymology of 'things' has been scrutinized by numerous scholars from Heidegger to Latour, to call things a 'gathering' is not enough. A gathering of what? And whence? Where the gathering of things has previously been analyzed in relation to larger social concerns (e.g., governmental issues, or matters of concern), I propose that such gathering needs to be investigated at a much lower level of abstraction: literally the point at which subjects and objects overlap within their shared environment.[15]

'Things' arise at the point of realized actionable possibilities that are the result of subject-possessed characteristics and object-possessed characteristics. In identifying the 'thingness' of a thing by means of the actionable possibilities it presents—rather than through any characteristics possessed by an object in isolation from a subject, a clearly agential actor—I seek to find the lowest common denominator between things: the fundamental, basic discourse that allows for, and subtends, the functional notion of 'things.'[16] From 'things' arises the archive; with the archive arises the historical, discursive human built upon the biological infrastructure of their embodied condition; in the changing composition of 'things' one finds the mechanisms of discursive

[15] In this way, my approach to 'things' is most clearly grounded in the theory of affordances first proposed by James Gibson in the 1970s and subsequently championed by Anthony Chemero and others.
[16] NB: here 'discourse' is applied not to a concept, but to the very possibility of interaction. In this light, discourse is as much embodied as it is inscribed.

transformation that will redefine the notion of 'the human.' My reason for adopting this unorthodox approach to the 'thing' is threefold.

First: in identifying and operationalizing the thing in its most basic form, but in a form that does not alienate the technical from the social, as in any consideration of the object-without-subject, I aim to develop a theory of things that is purely sociotechnical: that is, to develop a theory of the thing that does not dissolve the delicate marriage between the social and the technical for the sake of some objectivist 'truth' that might be deduced in the absence of the human.[17] My approach to the thing is fundamentally concerned with the process of being 'a human' in the world of subject-object constellations—particularly sensor-donning objects of the Internet of Things.

IoT is necessarily an instance of artifice (Simon, 1996), and I see no reasonable argument to remove its artifice from its basic analysis: it is artificial not just because it is designed, but because it is designed to accomplish some kind of goal. This goal must—unless non-human actors can be assigned the powers of purposeful design at the scale of a world-wide network—involve the subjects it impacts, the humans whose lives it is designed to impact. So, then, in approaching the 'thing' as a coupling of subject and object, I seek a paradoxical balance between the two: a balance that at once dissolves the boundary separating the two categories in service to understanding how they co-comprise the 'thing,' but also a balance that privileges the subject, the human.[18]

My second reason for taking the subject-object approach to 'things' is one of scale. In approaching the 'thing' as a subject-object coupling by means of which action is taken in the world—and therefore by means of which an historical and transforming discourse of 'the human'

[17] Frankly, there is too much at stake at the present moment to risk furthering the idea that the objects we design can be understood as anything other than 'designed for us,' and therefore designed for the world in which 'the human' (as a specific, historical operationalization of the subject) resides.

[18] NB: I do not intend to argue for a conservative definition of the human; this is not a return to pre-IoT humanism, but rather an acknowledgment that the human remains a human (albeit transformed) within the context of IoT. I do not argue for technodeterminism, but rather for the realization of human agency within the framework of technodeterminism.

is constructed—I begin with a notion of 'things' that scales completely. That is, such a notion is flexible enough to describe dyadic subject-object couplings that present in the present tense. It is also flexible enough to scale into the wide and ill-defined future of IoT present in the contemporary imaginary that holds it: a future wherein the coupling of subjects and objects to construct 'things' is not relegated to dyads, but rather constellations of varied composition. Indeed, in its flexibility, this approach also allows for the theoretical consideration of 'things' comprised in wholly novel ways: as in the case of objects imbued with prosthetic sensory devices that enable them to function as not purely objects, but as chimeric objects that evidence properties of both subjects and objects.

The third reason for approaching things as an affordance-based gathering is somewhat more theoretical, but no less reliant on the foundations laid by Gibson. In his theory of affordances, Gibson aptly points out the paucity of the subject-object dichotomy upon which the whole of our (Western) language functions. In pointing this out, Gibson's thought resonates with some of the deepest issues of our cognition and our ability to make sense of the world around us: that of the dialectic. Dialectics abound in the imaginary of IoT. At once there is a divide between: data and device; between human and computer; between mind and body (a resonance with subject and object). In approaching this dialectic not by virtue of the boundary that separates subject *from* object, but by means of the point at which they interact, I seek to introduce an understanding of 'things' that is processual: one that gives rise to a gestalt-like construction of 'the human' that is greater than the sum of the subject-object dyad. I argue that this approach is required if we are to understand the means by which discourse is transforming—power structures shifting—within the context of an imagined Internet of Things.

For Gibson, then, the question of perception—or rather understanding perception as it occurs in an environment—is muddied by the conceptually weak, yet pervasive dichotomy of 'subject'

and 'object.' I agree with Gibson, but to me this problematic requires further explication. That the components of the dialectic are rarely viewed in a wholistic way presents as problematic. To identify a subject and an object is to process the world in a linguistic way. But such identification of the subject-object dichotomy too often (if not routinely) leads to a categorical error: the belief that subjects and objects are reasonably separable, that they do, in fact, belong to diametrically opposed categories. This is simply shortsighted—it is a shorthand assumption upon which many forms of knowledge production are predicated: objectivism allows us to denaturalize the world through the creation of the category 'natural.' The world is observed; in being observed, it is divorced from the subject; in being divorced from the subject, it becomes 'objective.' The objective world is a construct, not an entity.[19]

In focusing on Gibson's identification of the conceptual paucity surrounding the subject/object dichotomy, I highlight the need to view such a dichotomy as two complementary domains, both of which in isolation are not useful concepts. Rather than approaching the subject in and of itself or the object alone, I argue that to understand the potential existential impacts of IoT—its effects on the future statement, 'I am human'—it is necessary to focus on the merger of subject and object, or at least the point at which they couple to form actionable possibilities. I refer to this point of coupling as 'the thing.'

So, then in hopes of achieving the greatest clarity possible, we arrive at the first iteration of my thesis formally stated: Internet of Things represents a potential fundamental transformation in the composition of 'things,' which is, as a discursive constellation of power, organization and communication, central to the construction and maintenance of the human archive. A change in 'things' is necessarily a change in the definition of 'the human;' a change in the definition of 'the

[19] NB: It is not my intention to argue for the wholesale abandonment of objectivism, but only to argue for its limited value. The scientific method is not the only means by which all worldly phenomena should be understood.

human' is a discursive change, which is evidence of a discursive transformation: new meanings emerge from the statement, 'I am human,' when that statement is made in the context of new constellations of subjects and objects that gather to produce a thing. Therefore, discursive transformation within the archive is effected by changes in the affordances that arise between subject and object. Such a transformation will doubtless have deep impacts on the construction of future historical *a priori* conditions. In order to begin to understand these future conditions, it is necessary to identify, describe, and interpret the imaginary of IoT: the primordial tide pool in which the waters of the archive swirl and recess and foster the evolution of IoT and therefore the evolution of the discourse of 'the human.' To transform 'things' is always already to transform 'the human.'

1.4 Enlightenment Things

Ours is a world of things, whether we are *in* it *of* it. As Kant put it, we emerge from our own self-imposed nonage into a state of enlightenment through the production of, and interaction with, novel forms of things (Kant, Gregor, & Wood, 1996). As we move into the imaginary of IoT—a set of possible adjacents—the world will remain one of things, of subject-object couplings and the affordances that arise from them. But the very quality—the spatiality and therefore temporality—of 'things' may well change. Similarly, the future historical *a priori* condition—the discourses, the set of possible statements that might be made of, or executed in, the world—that will arise from IoT might just be a form of archive not previously seen. That is, it might be one that generates itself for itself, blind to the sensations and perceptions of human subjects, of narrowly defined 'users' as a result of the rising prominence of the 'object' in the subject-object dyad of the thing. The possibility of this extra-human archive is the foundational logic for the possibility of an archvial divide resulting from IoT, wherein the archive—heretofore defined by human

embodiment—breaks apart into an archive of the human and an archive of the object. But before I dive into the theory of the archive or begin to describe the potential archive of IoT, we must first give more consideration to the notion of 'things.' This is necessarily a multi-faceted task. (I will return to more detailed coverage of the 'thing' in Chapter Two.)

We are simultaneously *with* and *of* the things around us. (While being *with* things might be an easy concept to grok, the latter might not. Still, we are most certainly *of* the things around us: food passes through us, air fills and leaves our lungs, the possible physical interactions with any given object occupy our minds. We are also, on a more metaphysical level, *of* the things around us because we perceive the world and subsequently make sense of it through the ways in which we might interact with or act upon objects by way of co-constituting things with them.) We act through objects, by means of constituting things with them. But IoT brings the nature of this ablative sense of things into question.[20] To pass through something, or to do something 'by means of which' implies distinction. That is, the ablative case implies a distinct separation of entities—something does not generally pass through itself, but through things external to the it. (A tunnel does not pass through itself; an infant transformed from fetus to child does not do so by way of itself, but by way of the vaginal canal in which the act of passage is the jussive act of differentiation between mother and child.)

The potentially changing constellation of subjects and objects that comprise 'things' in IoT blurs the boundaries between the distinct subject-object dichotomy and therefore necessitates a close, critical inspection of this ablative case. For example, data that is of the body-in-space (e.g., pedometer readings) passes from body to sensor, from sensor to cloud, from cloud to interface,

[20] I borrow this use of the term 'ablative' from the work of John Durham Peters (2015). In 'Marvelous Clouds,' Peters limns media in terms of the ablative case: *by means of*, *though*. In doing so, I aim to highlight the predicative nature of things: that they are not reducible to mere objects, but rather depend on the gathering of subjects and objects that give rise to potential actions. The acts of living are achieved by means of and through the gathering of things.

and from interface back to the body. This group of actants, both subjective and objective, could be considered a system—but a system that is artifactually heterogeneous, wherein the boundaries between the user/subject and the device/data are blurred. (This system is also not properly defined, as it is all but impossible to identify all components of the system, such as third parties that gain access to the data that is collected.)

This system is a 'thing' in a potentially novel sense: not just a gathering of multiple objects or multiple subjects for the purpose of addressing a world concern (as in Latour's famous 'parliament of things' [Latour, 1999]), but a temporally restricted set of relationships between subjects and objects extant solely for the production of a certain kind of data—the *post hoc* use of which is undefined.[21] Such a reconsideration of the thing as defined by the subject-object relationships that make it constitutes a Herculean endeavor: understanding and alleviating (to whatever extent possible) the 'paucity of the subject-object dichotomy,' and doing so in a way that is sensitive to the humanistic values that have waxed and waned in importance or visibility alongside the technological and logical developments of Enlightenment thought is no small task.[22]

As we make our way through the first quarter of the 21st century, questions concerning the production of knowledge—the ongoing (archival) experience of being in, and therefore knowing, the world—take center stage. Gadgets proliferate, and in their proliferation construct an increasingly ubiquitous layer of mediation between human actors in the present tense and the world-as-it-was—actors' mental maps of the conceptual, created world across time.[23]

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[21] This data is then ostensibly fed back into another system of subjects and objects for the purpose of creating knowledge, be that knowledge pertaining to marketing, to efficiency, to safety, to pleasure.

[23] It is not my intention here to indicate support for a purely representationalist theory of cognition, but rather to highlight the notion that interaction with the environment occurs at no fewer than two levels, one of which must resemble representationalism: direct interaction with the world (i.e., the execution of mundane activities such as walking down a street or buying a pack of cigarettes) does not require a representationalist 'inner map' of the world; however, deducing or abducing maps of the conceptual world grounded in archived, formal knowledge products requires just that. Rhumbas need not, but sometimes we as elephants do play chess (Brooks, 1990)

Here, at the forefront of the computerized world, the bleeding edge of silicon and sensors, the centuries-old dialectic of mind and body (and brain and body) comes to the forefront. It comes to the forefront because it has historically receded into the background, undergirding the rise of the computer-as-paradigmatic technology (Bolter, 1991). Such a rise is problematic on at least two levels, and these problematic qualities put it in focus: first, it reinforces the extant (and flawed) dialectic of mind and body, which is itself linguistically manifest in the ubiquity of subjects and objects; second, in reinforcing this dialectic, it performs a rhetorical function that precludes a resolution, or the identification of a third, interstitial category, where (as in a Venn diagram) aspects of externalism and internalism overlap — where the world is both 'out there' and 'in here' relative to one's cognizing apparatus. In questioning the possible meanings latent in the statement, 'I am human,' the work that follows identifies and examines this interstitial category by considering the social and scholarly imaginary that surrounds the Internet of Things as a manifestation of the archive. The world outside and within, in mutually co-comprising an environment for a subjective actant, appears as a clear and clean form of a Foucauldian archive: in the combination of all environmental characteristics (ranging from the written record to the geo-historically formed rock), one finds the boundaries of what can and cannot be said, what statements can and cannot be made. With a close eye to Foucault's definition of 'statements,' one further sees that this environment—the superset formed by the combination of the internal and the external, the subject and its environment—presents as archival because for Foucault (and Derrida, too) the components of the archive (discourses) both arise from and produce statements which are not limited to semantic communications, but also objects and events. Statements within the archive have always already been physical, though not expressly identified as such.

Through the lens of the Internet of Things, I demonstrate that discursive transformation within the archive is necessarily predicated on the troubling that occurs when internalist representations of the world within (imaginaries) meets the mediating and materialized manifestations of the world across internality and externality (archives) in order to create a theoretical realm of interaction: the archive. From this demonstration, I identify a set of discourses that, in reconstellation, hint at potential discursive transformations within the archive, and thereby shed exploratory light on what it might mean—cognitively, phenomenologically, and culturally—to be a human in the realized imaginary of IoT.

Big Data promises to offer unfettered understanding of worldly phenomena; innumerable facets of life are captured and translated into the visual, the technical image (Flusser, 2011b), to be viewed through the pervasive physical metaphors of the screen, the window, and the app; the logical importance of factuality (particularly in the United States) has been hamstrung with reductionist, frequently unfounded cries (or Tweets) of, 'Fake!' It would seem that, indeed, the medium is closer to being the message than ever before (McLuhan, Fiore, & Agel, 1996).

It is possible, if somewhat disconcerting, to see the current, troubled state of factuality as a vestigial tail—perhaps an unexpected mutation—of Enlightenment thinking. Following the trail blazed by Clifford Siskin, Bill Warner, and the participants in the Re:Enlightenment Project (Siskin & Warner, 2010), I take as a core assumption that The Enlightenment was fundamentally grounded in processes of mediation; moreover, that we are currently still living in a period of knowledge production basically characterized by Enlightenment thinking (Latour, 1993).[24] Siskin and Warner

[24] In light of Latour's beautiful notion that, 'The mediators have the whole place to themselves. The Enlightenment has a dwelling-place at last,' (Latour, 1993, p. 144) it is notable that a possible return to pre-Enlightenment thought has been suggested by George Q. Daley, Dean of Harvard Medical School: "If I had one worry, as we see the cacophony of confusion and alternative facts, it's that we're reverting to a pre-Enlightenment form of thinking, which will take us back to the days of blood-letting and faith-healing. And this is wrong" (Johnson, 2017).

argued that the technological mediations employed by Francis Bacon, and more broadly within the European scientific community of the 18th century, assigned to the notion of objectivity an importance not previously known. Evidence of such objectivity abounds: from the cool organization of textual entries in Diderot and d'Alembert's *Encyclopedie* to the illustrated birth of diagrammatic thinking embodied in the *Encyclopedie*'s engravings (Bender & Marrinan, 2010), the world comprised of concepts and phenomena became understandable through the mediation of pages, taxonomies, printing presses, and other technical apparatuses—information management is nothing new (Blair, 2010).

If, according to Kant, 'Enlightenment is man's emergence from his own self-imposed nonage [*sic*]' (Kant et al., 1996), then the maturation of Enlightenment occurs via the mediation of the apparatus. What we face now, in the first quarter of a new century, is then a need for an Enlightenment-geriatrics. By this I mean a methodology to understand not only how it is that the factual objectivity and humanism of Enlightenment thought has come, like Ouroboros, to swallow its own tail, but also to understand the potentials for further evolution. In short, and to reference again the Talking Heads, the question is no longer simply, 'Well, how did I get here?' but 'Well, where might we (perhaps 'it') go from here?'

The questions here have no static answer; nor do they likely have a definitive answer. Rather than an answer in the form of a definite destination—other, of course, than 'continually into the future'—any appropriate answer must take the form of a set of possibilities. My goal can be negatively defined along the lines, in part, of Flusser's treatment of forecasting: "Forecasting is not a matter of seeing what's coming. A forecaster looks in the direction in which the present seems to be pointing, at how things will come out, not at what is coming. One can predict outcomes but not what is to come" (Flusser, 2011, p.159). As such, and as stated above, the goal of this work is

not to choose a side with which to identify in the dialectics of the human and posthuman, the subject and the object, or media extensions and prostheses, but rather to attempt an identification of a third way relative to each of these dialectics: we are moving into a human condition that is predicated on simultaneous and conflicting theories of knowledge production. The goal need not be to determine which is absolutely correct, but rather to determine which experiential scenarios deserve to be treated according to one or the other mode of knowledge production. We are entering an era of the human-as-object, wherein we must learn to abide alongside multiple, conflicting, but equally valid modes of knowledge production. Failing the end of Enlightenment-like maturation, the identification of a third way—an escape from dialectics—is the way forward, is a new Enligthenment.

In the form of forecast that follows, the present tense will be of central concern. But this present tense has uncommon characteristics, and it is not entirely the trajectory of this present tense that is of concern. Rather than a temporality containing actions and reactions such as the exertion of force from fingers onto a keyboard, this present tense is a discursive present—a long present, a deep present. Conversely, its future is a near future, a cloud emerging from and enveloping the 'cool crypt of the past from which the present only reverberates as a faint echo,' giving rise to a peculiar spectrality (Krapp, 2004, p.31). This is a present of knowledge production extending down into the archive that subtends our sociocultural condition, but one that through extension transforms the archive—dusty and done—into its infinitive, 'to archive.' It is a present tense of 'always already mediated,' a present of sensorial, perceptual, and biological infrastructure, and as such, it is one of interaction and the state of interactivity: the relationship between subjects and objects, agents and environments, objects and inscriptions. It is *the* present tense of *things*, the construction of things and the construction of the world *through* things. In short, this present tense

is one of cloud-like possibilities that arise from interaction, and indeed, one of childlike, interpretive curiosity about the shapes that such clouds might take, the forms of knowledge that might coalesce through continued, world-building mediations.

1.5 Project Goals

This dissertation makes three equally important contributions to knowledge: first, it presents a novel theorization and analysis of 'things' in the contemporary sociotechnical sense predicated on post-Enlightenment mediation and the theory of affordances, thereby opening the analysis of IoT to fields such as communications, media studies (and archaeology), and the humanities more broadly (including Digital Humanities); second, it presents an empirically grounded identification and interpretation of the discourses that subtend the archival construction of 'IoT,' and therefore the construction of 'the human' within it; third, the work presented here leverages the unique qualities of our particular historical *a priori* to advance the theories of the archive developed by Michel Foucault and later by Jacques Derrida. It moves, then, from questions concerning 'the thing,' to those concerning 'the human,' and finally to limning potential futures of the archive itself.

Potential transformations hint at not only ontological shifts (e.g., transient ontological flattening wherein all actants are operationalized as mere components within a system), but also epistemic shits (e.g., the nature of what we know about the world at the scale of the mundane). Both such shifts—only potentials at the present moment—change the nature of what it means to 'be a human,' if to be a human means to live *in-situ*, in a day-to-day way, by making sense of the world around us and the particular historical *a priori* into which we are born. Thus, what follows will be a fundamentally (and unashamedly) humanistic analysis of IoT, but one equally as firmly

grounded in the notions of discourse and the archive: I am not willing to throw the baby out with the bathwater, or relegate the human to the status of an after-thought in the construction of ubiquitous connectivity and find it necessary to effect an infrastructural inversion (Bowker, 1994) that places not the object of IoT but their subjective users at the fore. An object-centric approach is as distasteful to me as it is unwise given that any social imaginary, any reasonable rendering of the future borne of humans, must have humans and the experience of being human at its core.[25] The question of the Internet of Things becomes a question of the ways in which the experience of being human—always already an ablative endeavor fostered through our relationships with the objects both natural and artificial that populate our environments—may or will change as a result of the ontological and epistemological transformations resident in the imaginary of a ubiquitous IoT, as well as those IoT-enabled objects that already exist.

Whereas I argue that 'things' have always already existed in the form of an unmarked category as subject-object, within the imaginary of IoT, 'things' still exist as constellation-systems of subjects and objects, but their systems are apparently always greater or equal to that of a dyad in size. Paradoxically, however, in systems that appear as dyads (e.g., subject-object, object-object), I will demonstrate that the composition of the system is always at least N+1, where N is equal to the number of visible subject- or object-actants that couple to produce the actionable potential of a 'thing.'[26] Thus an IoT-enabled thing, topically comprised of one subject and one object, is always already comprised of at least two subjects and one object—the additional subject is to be found in the institution (e.g., corporation) that has access to data extracted via the IoT-enabled object. The

[25] It is for this reason that I insist on interpreting the Internet of Things through the lens of its human components despite their pervasive absence from the scholarly discourse pertaining to IoT.

[26] Given my focus on the latent, potential meanings of the statement, 'I am human,' I do not directly consider 'object-object' gatherings: there is already a great deal of technical literature that addresses this aspect of IoT and, in fact, it is this overwhelming focus on 'object-object' gatherings that necessitates the execution of the current work.

inclusion of this illusive '+1,' like an unexpected guest, has far reaching implications for the power structures that define our culture and its society, just as it has far reaching implications for our ability to maintain a reasonable linguistic grasp of our world.

To approach IoT in such a way as to render visible the transformation of the 'thingness' of things, it is necessary to view IoT from three distinct vantages, each of which are conspicuously absent from the related scholarly literature: first, as that of a social imaginary, which presents as the real-time manifestation of the historical *a priori*—in doing so, this imaginary of IoT presents equally as entry into the archive of the sociotechnical; second, IoT must be viewed through a lens of simultaneous closeness and distance, such as is implied in the tremendous scalability of IoT;[27] third, IoT must be viewed as both signifier and referent: that is, it must be analyzed as both the interface of subject and object, but also as the imaginary in which such interface exists as potential and as modus operandi for living within an historical milieu.

Appropriate analysis of IoT occurs at the level of the text, where 'text' refers to artifactually heterogeneous objects, each of which bear through their very existence and situation within a given historical *a priori* traces of the archive they both maintain and transform. Texts here are not merely those objects that are apparently texts by means of their inscriptions, but interfaces including any and every object. So, in restatements: there is first the thing as coupling of subject and object; there is then the implication of this view on the modes of being exhibited by both subjects and objects involved in such coupling at scale; and then there is the imaginary that surrounds this 'thinging,' which manifests itself not only in cultural and societal norms and stories involving objects, but in such mundane and often forgettable aspects of the proto-thing as advertisements, packagings, explanatory videos, and business-sector public presentations. Each of these guides or nudge the

[27] This view from nowhere resonates with the Derridean notion of spectrality: closeness and distance occur along a spectrum, and we inhabit multiple perspectives simultaneously.

subject towards certain aspects of the object, thereby influencing the set of affordances that arise between the two to comprise the thing.

1.6 The Structure of the Dissertation

At the heart of what follows will be found question, a theme and variation in repetition *da capo al fine (ad infinitum)*: "What will it mean to be human in a future wherein the vision of ubiquitous IoT is realized?" In hopes of answering this question, the work that follows moves first from the scholarly archive about IoT, on to the identification, analysis, and interpretation of the discourses underlying the production and maintenance of IoT, and finally on to a forecasting of possible archival traits that may arise in a world where IoT is realized.

We reside now in transition between two historical eras: one known and one expected. The expected era will differentiate itself from the known through a discursive transformation of the human. This transformation stems from: (1) a reconstellation of the subjects and objects that gather to produce the things of IoT; and (2) the expected multi-scale, data extraction that drives the realization of IoT. These two factors transform the human and yield a temporary ontological status of subject-object chimera: a state wherein the human demonstrates qualities of both a subject and an object: she acts and is acted upon by the data her actions generate. The expected infrastructuralization of this feedback loop potentiates a transitional division and duplication of the archive: the human of the emerging IoT resides in a space between an archive of subjective, experiential knowledge and an archive of objectivist, prosthetic knowledge. The arrival of the new era will result from the reunification of this bifurcated archive, wherein the statement 'human

subjectivity is an object' will become not only possible, but fundamental to processes of knowledge production. The human will achieve her own objectivity. Rather than a prediction, however, this I present this statement as a matter of concern: it is too technologically deterministic for my liking. (Technological determinism removes agency from the human.) In presenting this statement as a matter of concern, I seek to highlight the need to develop a new epistemological ethics: one wherein the value of human subjectivity is maintained even in the face of ubiquitous objectivism.

My project has two main sites. Both concern the transformation of the human in the digital age. First, this dissertation is concerned with the notion of 'things' as a gathering. More specifically, it analyzes the constellation of subjects and objects that combine to form a thing in the context of the Internet of Things. Notably, these constellations of subjects and objects are both real and imaginary: they exist in the present tense and are projected from the present tense into a set of futures by means of inscriptive media. If, as McLuhan quipped, we see the past through a rearview mirror, the future is also funneled through the media to which we have access in the present tense: the past takes on the form of the rearview; the future takes on the form of the screen. The second site of this project is that of the archive: of the locus and mechanisms of discursive transformation that occur within the archive as described by Michel Foucault and Jacques Derrida. In moving from the first site to the second, I use a process of speculative deduction in order to theorize future iterations of the archive—future historical *a priori* conditions that will bound and shape the experience of the transformed human in the temporality of the day-to-day.

That is, such discourses as solitude and connectedness—I prefer the combination of these terms to 'privacy'—and agency are somehow changed in the realm of IoT, such that they mean something new. As nets cast and gliding through water, they have picked up additional meanings,

additional connotations like so many fish and plastic straws: additional possibilities. They are more and less than they were before.

At a deeper level, and as I will argue, so, too, is a fundamental cognitive and linguistic discourse transformed: that of the subject/object dichotomy as it is reflected in the term 'thing.' The 'thing' is no longer relegated to the status of a pure object or even a dyadic composition that stretches between one subject and one object. Rather, the 'thing' is (again) as a gathering of subjects around an object (but again-anew in the means of gathering that creates the 'thing'); or a gathering of multiple objects around a subject or set of subjects. The discourse of the 'thing' has, itself, been transformed by its enrollment in the archival realms of the Internet and the greater digital era.

That these changes in the discursive structure of our long present tense constitute discursive *transformations* (as opposed to re-constellations or re-orderings) is apparent: the world is different here in the IoT-enabled digital era than it was even in the early 1990s, and it seems impossible to revert. The presence of this apparent difference presents as an ideal impetus for archival analysis: to study the maintenance and production of IoT imaginaries, and therefore emergences that may arise from IoT to create future historical *a priori* conditions, is to study further potential discursive transformations within the archive: it is to study, by means of careful inference grounded in empirical and interpretive analyses, the mechanisms *responsible* for discursive transformations. As such, this dissertation aims to make new contributions to two separable but related fields: social computing and the archaeology of knowledge, both of which come together under the interdisciplinary field of informatics.

I argue that changes in the relationship between subjects and objects that comprise 'things' is the fundamental site of discursive transformation brought about by the rise of IoT: the archive,

born of its own documental holdings and the urge to document (and therefore to classify), is transformed by the materiality of its composition; is transformed by the interactive possibilities that arise between archivist and the materiality of the archive; is transformed by the human subject as they interact with the materialities (both new and old, ever heterochronic and heterogeneous) of their world around them. We live in the archive; we transform the archive by our ablative relationship with objects. In this way, and contra Foucault, I argue that the archive is now accessible in the present tense: it can be observed, and through observation the mechanisms of discursive transformation can be identified. Discursive transformation is fundamentally a material process, a process that is played out in the ablative case, wherein subjects know their world *by means of* the objects they use to knot it and inscribe it. To transform 'things' is to transform 'the human.'

1.6.1 Overview of Theoretical Framing

We—humans—are alive within history, within the archive as both subjects to it and constituent parts of it; (we are statements and events as much as any document); this history, this archive manifests in observable historical *a priori* conditions, which generally serve to periodize eras, centuries, and epochs. Until recently, these historical *a priori* conditions have only been observable through objects of the past—through the analysis of those documents and materials most commonly associated with traditional notions of archives. With the rise of new technologies—new modes and temporalities of inscriptions—commonly summarized by the periodizing term 'the digital age,' or (less commonly, but perhaps more accurately) 'the age of potential memory,' the discursive elements of the archive, of our contemporary received historical *a priori* condition, have become observable in a long present tense: they are as specters, partially

visible through the limns of still more urgent, more mundane archival manifestations: social imaginaries inscribed in the mass communications of (social) media.

I posit that a given historical *a priori* potentiates the existence of a set of social imaginaries (bounded by the discursive boundaries of the historical *a priori* conditions from which they emerge). These imaginaries constitute the link between the archive of the historical and the archive of the present, and in so doing, create a long present tense that is always already historical in nature. Further, these social imaginaries present as the conceptual sites of potential discursive transformation: in the possible social imaginaries stemming from a given condition, then, one can begin to assess and analyze potential mechanisms of discursive transformation within the archive. Where there is smoke, there is fire.

The ability to identify and analyze the potential mechanisms of discursive transformation is important because it is the transformation of discourses that gives rise to new historical *a priori* conditions: new eras, long centuries, new epochs: new sociotechnical conditions. The present tense of the archive, fractured and fractal in myriad, logically limited (but functionally limitless) imaginaries, presents as a unique site for the historical analysis of the present tense. By this, I mean the historiographical analysis of contemporary knowledge production, where knowledge production refers to the formal and informal means by which humans—and this dissertation will be limited to the notion of 'human knowledge'—navigate their worlds across time. If we can come to understand the mechanisms of discursive transformation (or at least a subset of them), then we can gain a broader understanding of societal structures, the development and impacts of epistemic cultures, the death of the truth and factuality.

But there is still one more thing: I have said that social imaginaries present as the observable symptoms of a greater historical *a priori* condition and, indeed, provide hints at the

formation of future historical *a priori* conditions. This is an accurate statement, or rather a statement that accurately captures my theoretical views, but one, too, that requires further clarification. The need for clarification comes with the appearance of the term 'social,' which despite its breadth, is too reductive for my present needs. Instead of 'social,' then, I will speak of sociotechnical imaginaries: modes of being and expectation, intertwined with and dispersed between actants that span the categories of subjects and objects. But this—'the sociotechnical'—too, comes with problems.

Given that our contemporary historical *a priori* is dominated by digital technologies, the role of the 'technical' in 'sociotechnical' casts a long rhetorical shadow over the 'social.' Indeed, the social is often seen through the lens of the technical, rather than each seen simultaneously through the lens of the other. This, then, is where I begin: with an unstable balance between the subjects and objects, the socio- and the technical as they are represented in sociotechnical imaginaries. From these imaginaries, I believe it possible—and it is my goal to do so—to identify and analyze the discursive elements active in and responsible for the maintenance and transformation of one particular set of contemporary phenomena, which reside at the bleeding edge of the sociotechnical: The Internet of Things (IoT). I seek to engage in such identification and analysis in hopes of constructing and armature that will support abductive inference as to not only the mechanisms of discursive transformation, but also the characteristics of potential historical *a priori* conditions that may arise from our own.

Through a practical lens, then, the goal of this project is twofold. Simply put, I seek to first say something about the Internet of Things and then, secondly, to say something about the archive and the mechanisms of discursive transformation by leveraging findings relevant to IoT. This could

also be stated as: studying a nascent infrastructure so as to further study the human—after all, the archive is, like any sociotechnical infrastructure, first and foremost a human construction.

In sociotechnical imaginaries—and thus visions of potential sociotechnical systems and infrastructures—the human is too frequently reduced via operationalization to the status of a 'user.' In something of a paradox, this is perhaps unsurprising because we, as humans, tend towards an implicit understanding of what 'human' means: how can we *be* humans if we don't know what it *means* to be human? (If badgered, I might argue that we have forgotten what it means to be human in large part due to the goals of the Western objectivist project, which has increasingly overshadowed humanism and the human act of critical interpretation.) Reliance on this impoverished view of the human—the user—as an unmarked category comes with great risks. These risks have roots not only in questions of ontology and epistemology, but also in the value propositions that arise from designed objects that cater to only a narrow operationalization of the human. When human phenomena are objectified, they cease to be human; when they are understood as objectifications, their objective qualities are reflected back on the human, thus transforming the discourse of 'human.'

In being a sociotechnological imaginary (or a set of such imaginaries), the Internet of Things is no different: it is most frequently operationalized not in terms of the richness and diversity of 'the human,' but in terms of the functionality of its component systems and objects. These systems and objects implicitly reduce the human to the status of the user: a user of this object, or of that system; a user-resident of that city, this home, or a body (thus perpetuating the pitfalls of Cartesian dualism). In such reduction, the human—an embodied subjectivity resident in a phenomenologically rich *umwelt*—is conceived of not as an irrational actor, a whimsical joker, an anxious depressive, or an introspective flaneur, but as a function of a given set of objects and

hopeful infrastructures: smart homes, smart cities, smart bodies, each of which can be designed and controlled towards greater efficiency. The subjectivity of the human-as-user becomes defined by its association with a set of objects, which design the human-as-user as much as the objects are themselves designed. Such is the discursive transformation of the human to which IoT alludes.

That the world is in turmoil almost a quarter of the way through the twenty-first century is apparent. The Western drive towards objectification—along such avenues as Fascism, or the re-emergence of rightwing populism, and the colonial proliferation of computerized empiricism across the gamut of scholarly disciplines—may well be responsible for our current predicament. We objectify phenomena in the world so as to understand them via systematic knowledge production; in understanding them we render them artificial *through* objectification. It is a tautology from which it is remarkably difficult to remove oneself given that the dominant epistemic culture in academia is that of (computerized) empiricism.

But, as with the reactive formulation of the project of phenomenology against the rise of increasingly objectivist philosophical tendencies in England and the United States in the early twentieth century, it is possible to break through the ontological and epistemological membranes of this unfortunate tautology by reconsidering the role of the human: by engaging in a truly human-centered sociotechnical project. By this I mean to engage not in the top-down operationalization of the human in terms of the objects they use (and thus build infrastructures to which the human subject must adapt), but in a bottom-up consideration of the objects that humans use *from the vantage of the human*. Given that the human resident in humanism does not exist in a physical vacuum, such a bottom-up approach must begin at the level of the 'thing:' not only of the 'thing' in a present tense, wherein a subject couples with an object by way of affordances (or actionable

possibilities arising from characteristics of a subject and an object within the same umwelt), but also in an historical sense, wherein the history of affordances, of actionable relationships between humans and inscribed materials, gives rise to historical *a priori* conditions. This project, then, takes the form of an investigation, rooted in overtly prideful humanism, into the composition of 'things' and the means by which 'things' constitute the archive and thus give rise to sets of potential historical *a priori* conditions, or futures.

The recent rise of the Internet of Things, and its perpetual framing against the future, provides a uniquely perspicuous opportunity to engage in such a project. We must: first, dig down and across as interdisciplinarians—as *informaticians*—into the layers of the ontological (and phenomenological) *longue durée* to question the values and assumptions we receive via the subject/object dichotomy, and thus 'things,' to understand just what an Internet of Things might look and feel like; second, explore the ways in which these assumptions and value propositions are represented in the negotiation and maintenance of the imaginaries of IoT; third, abduce the means by which the IoT will impact the formation of future historical *a priori* conditions. This third task constitutes no less than a fundamental reconsideration of the means by which discursive transformation (within the greater archive) occurs. These are the necessary steps; these are the three parts of this dissertation.

1.6.2 Overview of Chapters

Part One—comprised of Chapter Two and Chapter Three—provides an introduction to the problem at hand, which can be formulated as a broad question: 'What will it mean to be human—to *be in* and *know* the world in a human way—in a future historical *a priori* that is defined by the ubiquity of sensor-laden, IoT-enabled devices?' This question can be further broken down into at

least five sub-questions: (1) What is the role of the human in the construction of a 'thing' in both pre- and post-IoT formulations?; (2) What is the discursive composition of IoT? (3) What is at stake if the 'things' of IoT continue to be operationalized from the vantage of the 'object' rather than the 'subject'?; (4) What discursive transformations within the greater archive are made possible through the reconstellation of subjects and objects that is implied by the term 'things' in IoT?; and (5) What are the mechanisms of these discursive transformations? These are not simple questions, and the length of this dissertation—both on the page and in time—is evidence of their complexity.

Part One formally commences with the provision of a critical literature review in Chapter Two. The literature review is intended not as an exhaustive annotated bibliography of scholarly discourse pertaining to IoT, but rather as a grounding mechanism: it is like a map in a shopping mall telling you that, 'you are here.' In this review, I rely first on extant summaries of IoT as they are presented in the scholarly literature. Secondly, I provide a quick critical discourse analysis of definitions of IoT from 1999 to roughly 2014. Perhaps unsurprisingly (as the state of IoT research has validated and indeed given rise to the writing of this dissertation), I identify a tendency towards operationalizing IoT in terms of its objects (i.e., devices) rather than its ostensible users. As a means of identifying extant in-roads to a reciprocal formulation of IoT (i.e., in terms of users rather than objects), I identify and analyze two canonical IoT articles that deal with historical conceptualizations of IoT.

Following the broad critical literature review that begins Chapter Two, I engage give primary focus to Kevin Ashton's retrospective definition of IoT. I call it a retrospective definition because, published in 2009, it was intended as a clarification of what he had in mind when, in 1999 at a woefully undocumented meeting at Proctor and Gamble, he coined the term 'Internet of

Things.' Through a critical analysis of this document, I find that Ashton's original conceptualization IoT is predicated on the ontological and epistemological supremacy of objects over subjects.

Stemming from the concern that this hierarchical relationship between objects and subjects engenders, I conduct a close reading of another conceptualization of IoT, also dating from 1999: Neil Gross's 'In the 21st Century, The Earth Will Don an Electronic Skin.' As a result of this close reading, I identify several ways in which a more humanistic—or subject-oriented—conceptualization of IoT is beneficial. I return to previously discussed definitions of IoT in order to compare their assumptions with those of Gross. At the point of this comparison, some difficult methodological decisions become necessary. In short: how best should one go about creating empirically grounded breathing room for the subject in an ontology that seems formally predicated on the epistemic supremacy of the object? As such, I temporarily break from analysis and move on to answering this methodological question.

In Chapter Three, I present an outline of the methodologies employed in construction of this dissertation, such that we might being to formally construct a humanistic, but empirically grounded, analysis of IoT—its discursive construction and the potential futures it represents. These methodologies include: critical discourse analysis of extant texts; distant reading of popular discourse about IoT in social media, in the form of Latent Dirichlet Allocation (LDA); the construction of a topic model representative of one potential constellation of discourses underlying IoT; the phenomenological, semiotic, and discursive analysis of media used to represent the imaginaries of IoT; and finally philosophical inquiry grounded in phenomenology (and largely in response to the archival theories of Foucault and Derrida) into the discursive composition of an historical *a priori* condition defined by the ubiquity of IoT.

Part Two of this dissertation comprises three chapters. Chapter Four begins with a theorization of the long present tense: a theorization that allows for the statement 'the archive is accessible in the present tense.' Relying upon my interpretation of the work of Annales School historiographers, I justify the use of distant reading (particularly LDA topic modeling) as a means by which one might gain entry into the contemporary discursive topology of the archive. Following this theorization and justification, I present the results of applying LDA topic modeling to a sample of tweets scraped from Twitter during 2014. (For a close description of the methodology employed, please refer to Chapter Three.) I argue that the sample of tweets scraped from Twitter provides access to the historical long present tense of IoT—to the set of social imaginaries from which one can deduce the discursive structure of IoT. Ten topics are produced via topic modeling; each are analyzed in turn. (They are analyzed according to best practices evidenced in the Digital Humanities community.) Following initial analysis, I regroup these topics according to themes that emerge from their interplay. The three primary themes (discursive constellations) identified are: (1) the role of materiality in the maintenance and negotiation of technological futures; (2) the heterogeneity of 'the individual,' and therefore the 'subject,' in relation to objects as they are defined in IoT; (3) the notion that IoT is scaled into three broad categories including the city, the home, and the body. These three themes become the central focus of the next two chapters. Primary focus is given to the relationship between materiality and the future, which, in turn, partially explains the tendency towards the objectification of the human.

In Chapter Five, I present analyses of communicative materials—videos, webpages, emails, images, diagrams—that describe visions of IoT at the scale of the smart city and the smart home. In so doing, I identify data extraction as a core motivating factor for the development of the

post-RFID phase of IoT. Based on this finding, I lay the groundwork for the emergence of the human subject as a subject-object chimera. In addition to this, I analyze the communicative media as things themselves: gatherings comprise of subjects (viewers/readers) and objects (viewed/read) that present not only as rhetorical means of enrolling potential users into the imaginary of IoT, but modalities that prime potential users to accept the communicative modalities upon which IoT will rely: the GUI. In so priming potential users, the subjectivity of the user is further reduced: not only is there evidence to conclude that users are being ontologically recategorized as objects via the processes of data extraction upon which IoT is predicated, but they are becoming more reductively subjective by the subtle stripping of all but the sense of sight, audition, and touch. (Notably, audition and touch are evidently lesser than sight: touch is reduced to a binary sort of feedback [is it vibrating? Is it not vibrating?] and audition is reduced to a signal nudging visual interaction with IoT devices.)

The futures of IoT and the representations of those futures covered in Chapter Five, however, do not deal explicitly with the human as a primary subject. Rather, the city or the home take primacy in these representations. In order to address this gap in coverage, I turn my attention to IoT as it is imagined and represented at the sale of the human body in Chapter Six. Primary focus is given to FitBit devices, a posture-correcting device, and a blood-sugar monitoring device. In this Chapter, I frame much of my analysis in terms of the Flusserian theory of technical images. I argue that the human-subject is ontologically transformed into an objectified-subject through her willing enrollment into the technological ecology of IoT. In so being transformed, she engages in a feedback loop between two versions of herself: the experiential self, which exists before enrollment with IoT devices, and the technical image of herself that is created through data extraction, analysis, and re-presentation. I further argue that the ontological category of the human

is inseparable from the category of things: we are humans through and by means of the things we co-constitute.

Part Two concludes with a summary and further exploration of these findings. They indicate that the future historical *a priori* conditions of IoT—the future into which we are currently transitioning—as indicated by expressions of contemporary sociotechnical imaginaries of IoT, are negotiated and maintained through heterogeneous modes of communication, which constitute things themselves. These things present as both images and technical images. The technical image is produced through both narrativized representations of future sociotechnical conditions and through the feedback of data-extractive information to the user that generated them.

Additional findings are presented that implicate IoT as a definite site of discursive transformation, where the primary discourse that is transformed is the subject/object dichotomy: things come into 'thingness' in IoT through the simultaneous coupling of multiple subjects around a given object. The subject-object relationship that gives rise to the 'thing' in IoT is emphatically not one-to-one. This is evident across all media formats used to express future imaginaries of IoT and carries with it deep implications for the construction of future historical a prior conditions. The primary implication is the chimerical state of the human as an objective-subject. Further, it carries, as must any discursive transformation, implications for the structure and function of the future archive. I argue that the analysis of the aforementioned representations of IoT at three different scales supports the conclusion that to be human during the current historical era (which is periodized by the emergence of IoT) is to be transformed into a subject-object chimera: the human demonstrates characteristics of both subject and object as she engages in actions that generate data and is acted upon through the feedback loop by which analyses of those data are re-presented to her.

In Part Three of this project—the conclusion—I turn my attention fully to theories of the archive. Through presentation and analyses of Foucaldian and Derridean theories of the archive, I argue that the present historical state is one of a duplicated archive. We are living in a state of transition between one era and another: that which arrives will herald itself with the subtle, infrastructure-like reclassification of the human as an object. *The user* will be fully reconfigured through their chosen technologies into *the used*; agency will be distributed to the objects that extract data for the sake of institutional, corporate, governmental and geographical information. Like a cell dividing into two via cytokinesis, the archive has created a mirror image of itself: this mirror image, however, is an image wherein the human subject is both subject and object. Again, this is only a temporary state: it is the very essence of discursive transformation, and we are living in it. I argue that in being both subject an object, the human will ultimately be reclassified as an object. So, like cytokinesis gone cancerously wrong, the divided archive—the newly spawned archive of objectivist reductionism that consumes the human subject—must ultimately efface the archive of subjectivity. I examine the implications of this future archive in terms of the definition of the user (HCI), documentalism (LIS), and the experience of being a human (humanist psychology).

Chapter Two: Critical Literature Review

2.1 Introduction

> But everywhere else, and still constantly in our own societies (and no doubt for a long time to come), a fundamental situation perseveres which arises out of the human condition: namely, that man [*sic*] has from the start had at his disposition a signifier-totality which he is at a loss to know how to allocate to a signified, given as such, but no less unknown for being given. There is always a non-equivalence or 'inadequation' between the two, a non-fit and overspill which divine understanding alone can soak up; this generates a signifier-surfeit relative to the signifieds to which it can be fitted. So, in man's effort to understand the world, he always disposes of a surplus of signification […]. That distribution of a supplementary ration – if I can express myself thus – is absolutely necessary to ensure that, in total, the available signifier and the mapped-out signified may remain in the relationship of complementarity which is the very condition of the exercise of symbolic thinking.
>
> (Levi-Strauss, 1987, p. 62-64)

The quote above is found preceding Levi-Strauss's introduction of the term, 'floating signifier' (Levi-Strauss, 1987, p.62-64). I have chosen to begin this chapter with its presentation because it sheds an unusually bright, yet diffuse contextual light on a signifier that emerged only at the turn of the 20th century, and which has come to be somewhat uniformly addressed in the scholarly literature of late: The Internet of Things (IoT). The light these lines cast is as light shone through shallow, flowing water. Glints of cognition, linguistics, media theory, and phenomenology peer back up through the water's surface, presenting a glimpsed reflection of the future human even as they refract and distract into myriad research trajectories.

Where does one begin to analyze 'Internet of Things'? The answer must not be any one place in terms of extant and well-defined scholarly disciplines, but rather from the 'every place' that is found in the currents of the social imaginary. In order to approach this 'every place,' we must first develop the kaleidoscopic lens that allows for such a disjointed, but holistic view of the topic. To do this, we must begin again with the disciplines.

As I will argue in the following critical literature review, interdisciplinary scholarship is markedly absent from the extant work on IoT. This is particularly true of interdisciplinarity that incorporates the humanities. Moreover, its absence carries with it three potentially catastrophic risks, which I will enumerate here and elucidate in what follows:

> (1) Given that the objects contained in the 'things' in IoT are necessarily designed objects, as broad an understanding of IoT as is possible is required to identify the potential set of futures (and their 'wicked problems,' not the least of which is the unforeseen discursive transformation of the human) that may arise across specific use cases and relative to the set of values that shape a given culture (Buchanan, 1992).

> (2) Given that the ontological implications of IoT are grounded in the collection, and therefore creation or capture, of data, IoT presents as an epistemological infrastructure: it presages a new epistemic culture wherein the subject-user knows herself through the data she generates. The envisioned pervasiveness of IoT implies the continued evolution and spread of a deeply (perhaps unquestioningly) empirical epistemic culture (Knorr-

Cetina, 2007), wherein empirical knowledge production is reducible to a set of circumstances defined by the use of prosthetic sensors, rather than inclusive of the rich and varied forms that human observation may take. As Bowker (2009, p.128) describes via the words of Howie Becker, the spread of such an epistemic culture potentially results in the adoption of the following stance: "They used to think but now we know," where the inherent, experiential validity of being-in-the-world is replaced with the cold and reductionist certainty of a computer-born knowledge. Such a stance risks functional negation of the value of what has been known via other means of knowledge production, if not the value of attempting to know via other means, of 'daring to know'. In short, such a stance can do nothing except transform the discourse of the human if to be human is to live in the world and therefore to know it: such a stance pivots the location of knowledge production from the condition of human embodiment to the condition of prosthetic, extended perception.

(3) Should technical systems evolve in an increasingly sensor-driven fashion—one which disrupts direct subject-object relationships by the introduction of silent, flashing proxies (i.e., hidden subjects, hidden objects)—then the social extensions of those systems will similarly evolve. It is possible that the blindly confident development and adoption of IoT (like breadfruit to Larkin, 'whatever they are' [Larkin, 1961]) will lead to the development of a sociotechnical system that forgets, that erases or

> overwrites prior sociotechnical systems as in a palimpsest. The critically unchecked development of IoT risks transforming the human archive in such a way as to permanently obfuscate and prematurely invalidate pre-IoT modes of existence and knowledge production. It would not be a forgetting of the factual or the data-driven, but an amnesia of self: a systematic purge of those humanistic modes core to both camps of scholarship (Snow, 2012): humanities that were in fleeting moments, on busy streets, in wet labs and quiet interviews, in parks and movie theaters, in solitude and divorced from the durability of the inscribed and inscriptive archive.

Much in the same way that *mana*, the exemplar floating signifier identified by Levi-Strauss (1987) in his analysis of the work of Marcel Mauss, is a quality 'with which virtually any unknown object may be endowed,' IoT signifies a referential category to which virtually any object may be made to belong — so long as it is connected to, and identifiable on, the Internet (Mehlman, 1972, p.22). A FitBit Zip? That's IoT. Electronic skin? That's IoT. The port of San Diego? A vibrator? A driverless car and a municipal recycling bin? That's IoT, too, if each of the devices listed are computationally augmented and represented on the Internet. As signifier, IoT has been so used as to potentially include any object that has been coupled with a sensor and a network: even the silly ones. So, what about a unicorn with steamy rainbow flatulence? Yes, that's also IoT, particularly when its emissions signal the appearance of a Tweet![28]

From the abstracted and formal to the forgettable and mundane, IoT is colonizing and reshaping the subject-object dynamics of the human archive. It is colonizing in both ontological

[28] See the subsection, 'Generating Magical Rainbows with IoT Technology' (https://readwrite.com/2016/04/19/tootz-iot-unicorn-farting-rainbows-intel-dt4/) for a description of Tootz, the rainbow farting unicorn.

and epistemological sense. Fitness, first aid, shipping, coitus and onanism, transportation, waste management, social media communications, postal mail, and meme-driven novelties all belong, in a way, to the referential category of objects belonging to IoT. As a set, these heterogeneous couplings point to a sign that approaches pervasiveness. In its pervasiveness, it begins to lack indexicality—what is the value of a signifier if the 'there' of its referent is potentially everywhere? ('There' becomes invisible, a lens that is forgotten because everything is seen through it; a structure that infrastructures through its invisibility.) In its growing pervasiveness, the heterogeneous artifactuatl makeup of IoT constructs an unexpectedly homogenous indexical passage point—to which the social imaginary acclimates like a wristwatch worn for more than a few minutes. Like the wristwatch, it becomes a naturalized means of interpreting the world; it becomes an extension that is no longer known as an extension.

Perhaps in response to the disappearing indexicality of IoT—after only about twenty years since the term was first coined—the proliferation of object-referents to which the floating signifier 'IoT' can be coupled has been met with a proliferation of competing, ostensibly more specific, floating signifiers. They generally begin with the terms 'Internet' or 'Smart:' "Internet of Everything,"[29] "Internet of Your Things,"[30] "Smart Cities," "Smart homes," "Smart cars," "The Internet of Dongs,"[31] "The Internet of Dead Things,"[32] and even, "Internet of Shit,"[33] come to mind. The designed domain that arose from the combination of three words appears to spiral into an infinite loop of branding, marketing, attempted differentiation, and positions for critique.

[29] https://www.cisco.com/c/r/en/us/internet-of-everything-ioe/sea-change/index.html
[30] https://www.mysensors.org/about/iot
[31] https://internetofdon.gs
[32] http://www.theinternetofdeadthings.com
[33] https://internetofshit.net

As such, my approach is not to burrow into the specifics of each of these competing signifiers. Instead, it is to telescope: rather than analyzing the differences between these nascent and quarreling late capitalist categories, I will analyze what they have in common. Paradoxically, this investigation of commonality is an exercise in deconstruction. If the positive definition of IoT can be found in the cumulative, additive definition provided by each of these signifiers and their points of overlap, then one must turn to the negative space in which that positive definition resides in order to determine the holistic concept of IoT: the foreground of IoT cannot exist but for the background that contextualizes it. The background appears only in relation to the Gestalt of synthesized referents. It is, therefore, the present task to identify and re-member that background, as nothing is so important for the appearance of a subject as the environment in which that subject resides.

The sign that is partially constituted by this set of floating signifiers shares one fundamental trait that unifies it under the term 'Internet of Things:' the combination of network-connectivity and the sensor-enabled control or collection of data for the purposes of some kind of empirically grounded analysis. (IoT is inseparable from data-driven knowledge production in that the computerization of objects always already implies data collection when computerization occurs under the aegis of The Information Age.) In the same way that E.M Forster reluctantly concluded that a novel tells a story (Forster, 2010), we can conclude that IoT collects and communicates data. We can similarly conclude that the construction of IoT, as a signifier for a category of referents that collect and communicate data via sensors and network connections, is a fundamentally empirical endeavor.

Here, in the apparent relationship between IoT and empiricism, appears something more interesting: IoT can be interpreted as an epistemic phenomenon. That is, while the use of the term

‘things’ in IoT obviously points in the direction of ontology, the use of the data created by such sensing-things is necessarily an epistemological concern: the means by which we know about phenomena in the world changes the ontology of phenomena in the world. IoT emerges as a nascent epistemic mode that effects an ontological transformation. In that it is an epistemological concern, it is also a humanistic concern. Epistemology is concerned with how we know the world; to be human is to know the world through human sense and perception. Therefore, to know the world through the use of a specific and new class of ‘things’ is to be human in a new way; to know through and by means of new constellations of subjects and objects.

While there are notable disjunctions between humanism and contemporary epistemology (e.g., the inherent conflict between correlationist views of knowledge and experience and twentieth century analytic philosophies that fall closer to the realist camp), both can be interpreted as human-centered. Whether or not the search for ‘truth’ is conducted overtly through the senses and perceptions of the human or in such a fashion as to bypass the sensation and perception of the human (as in the case of empiricist mediations and perceptual prostheses), the human mind stands as an obligatory passage point between the two. There is no philosophy without mind: no humanism, no realism, no OOOs or searches for universal logics. Each and all derive from the confounding positionality of ‘the human in the world.’

The language that describes these schools of thought, these isms, is as an interface between individuals that translates and creates the world as interpretable to such individuals. Whether arguing for the centrality of the human in knowledge creation or beyond the human to a more universal set of logics or truths, the centrality of the human is always already implicated by means of the language from which these isms arise. The development of any ism through which the

physical/conceptual world is communicated is always already a human endeavor and therefore subject (in-part at least) to the historical reign of humanism.[34]

Through the interrogation of this line of logic it is possible to arrive at a humanistic armature for an investigation into IoT: if IoT comes into existence by way of human interventions that network together objects appended with sensors of one form or another, then the construction of an IoT-oriented epistemology rife with hyper-mediation, sensorial and perceptual interlocutors, and all possible variants of communication involving machines and humans (e.g., machine-to-machine, machine-to-human, etc.) warrants study via a humanistic lens. IoT refers to, as I will demonstrate, a category of 'things'—of subject-object relationships—through which we will create and see a previously invisible (possibly non-existant) world and know that world by empirically grounded, reductionism modes of description. In so referring, the notion of the 'thing' encapsulates both subject (i.e., the user) and the object (i.e., the used). The objects that we use in the context of IoT constitute, then, augmentations of the human: these augmentations change the human user as much as they change the category of 'objects' in that they provide human access, by proxy, to previously imperceptible data.

The humanistic study of IoT, while validated by the aforementioned logic, is not the sole approach to understanding IoT; nor do I argue that a humanistic approach is somehow superior to other approaches. But, given that such an approach is missing from extant literatures pertaining to IoT—as I will demonstrate in the subsequent sections of this chapter—it is an approach that must be investigated in good faith: this absence is a hinderance to understanding what it will mean *to be a human* in a sociotechnical milieu defined by ubiquitous IoT.[35] To borrow a term from Derrida,

[34] This is perhaps an argument for an always already condition underlying the anthropocene. (*Veni, vidi, vici*: we came upon our legs through the inputs of our senses, and in coming, we conquered even before we intended to conquer.)
[35] This is an approach that might be called 'digital humanities' but for the ultimately disappointing bent that burgeoning field has adopted: this is the humanistic study of the digital rather than the digital study of the humanistic.

IoT-as-humanistic-endeavor is the 'spectral' (Derrida, 2006) complement of IoT-as-engineering-feat. It is present by means of its absence; it is a specter worth channeling.

If IoT is to be leveraged to generate knowledge relevant to categories of phenomena beyond the boundaries of its own inherited epistemology—a particularly contagious strain of computerized empiricism that presents with symptoms of radical positivism and a reductionist tendency toward factuality that divorces data from human experience—then it is insufficient to study IoT solely in terms of the data it generates, or in terms of the electronic means by which such data is generated. Sufficiency only arises through the study of the relationships between subjects and objects that these data construct and maintain. To appropriately study IoT is to study that which surrounds and contextualizes, subtends and undergirds its emergence. To that end, I posit that 'IoT' can be interpreted as the signifier component of a sign-in-motion, the motion of which constitutes a relevant lens through which to view the multi-faceted relationship between two categories of actants: the human and the (computerized) environment; or, the subject and the object.

The recent emergence of this sign-in-motion connotes a sea change in the sociotechnical imaginary relative to the future—a change that alludes to looming naturalized in-folding of the technological-prosthetic into the categorical 'human,' thereby irrevocably transforming the referent 'human.' The discourse of the human transforms as a function of re-constellation of subjects and objects in the gathering of things. The potential referential trajectories of this sign-in-motion are bounded by the constellation of referents, either partial or whole, to which the signifier 'IoT' can be coupled in any given situation.

In order to gain an understanding of IoT beyond the physical boundaries of mediating, designed, computational objects that populate IoT, it is necessary to access the conceptual domain, the archive, from which IoT springs. If, as I have argued, the archive is born of human embodiment,

then this means that it is necessary to consider the the 'things' of IoT in terms of human embodiment. This is at once a semiotic endeavor, and therefore linguistic, and also an archaeological (Foucault, 1982) and phenomenological (Derrida, 1998) endeavor. That is, this is a project that must straddle the boundary between discursive language-as-set-of-signifiers and discourses as relationships between embodied statements that determine what further statements can and cannot come into being.[36] More broadly, then, this project—the interpretation and analysis of latent meanings resident in the statement, 'I am human,' when uttered in the context of IoT—is one of textuality wherein 'text' is operationalized as materialized relationality between statements across human- and non-human actants.

In order to approach this materialized relationality, to construct the kaleidoscopic view, I will begin a review of IoT literature from a place at which the human- and non-human aspects of textuality meet quite clearly: scholarly journal articles. From there I will address IoT as it is treated in longer form scholarly (and pseudo-scholarly) monographs. The goal of this approach is to provide context for what will follow. But my aim is not to simply provide a laundry list of related works—'she says this about IoT; he says that.' Rather it is my goal to provide a deep reading of how IoT is treated within academia and in those areas that are academia-adjacent (e.g., industry, popular culture). The provision and analysis of scholarly definitions of IoT will provide a backdrop or means of comparison for the treatment(s) that IoT receives in the greater social imaginary. As such, the impending literature review will be deeper than it is wide, but its width will be sufficient to construct a robust armature for the critical discourse analysis that will follow.

[36] NB: The Foucauldian definition of 'statement' includes events. This inclusion of events implies the primacy of human embodiment: there is no event without the means to perceive it.

2.2 Definitional Treatments of IoT

It is generally not my preferred mode of description or inquiry to provide lists. However, the provision of data in list form appears as the most germane procedure when attempting to derive commonalities and differences—a sort of narrative—from definitions of something, such as IoT. As such, what follows comprises first a descriptive list of definitions provided by scholars working the in realm of IoT, and second a critical reading of these definitions as they constellate to form the basis of the scholarly literature. I present representative definitions below and analyze them in terms of framing, scope, similarities, and differences.

The goal of presenting these definitions is not to be exhaustive. Rather, it is to gain an exploratory feel for the boundaries of IoT as discourse, or set of discourses: to limn the vertical statements involved in the construction and maintenance of the scholarly imaginary of IoT, and to induce the discursive constellations that these vertical statements construct. This is a worm's-eye-view of IoT—in particular, a worm's eye view of how scholarly literature defines and bounds IoT—which will allow for subsequent views that are more detailed and less concerned with scholarly approaches.

2.2.1. Towards Defining IoT

The term Internet of Things was first used by Kevin Ashton in 1999 (see Ashton, 2009) during a presentation he gave to Proctor and Gamble. Although certain related fields of computer science (e.g., ubiquitous computing, pervasive computing, AI) were already in full swing by this time, and it is no stretch of the imagination to see an historical link between these fields and the emergence of IoT, I will relegate discussions of IoT to dates occurring after 1999. Detailed discussion of

Ashton's definition of IoT will be provided in a subsequent section this chapter for reasons of readability.

A very early definition of IoT—although it does not run under the name 'IoT,' but rather "The Electronic Product Code (EPC): A Naming Scheme for Physical Objects"—comes from David L. Brock (2001) at MIT's Auto-ID Center. He writes:

> Our vision is to create a 'Smart World,' that is, an intelligent infrastructure linking objects, information and people through the computer network. This new infrastructure will allow universal coordination of physical resources through remote monitoring and control by humans and machines. Our objective is to create open standards, protocols and language to facilitate worldwide adoption of this network—forming the basis for a new "Internet of Things" (Brock, 2001).

Two characteristics of IoT are immediately apparent in this quote: connectivity and standardization.[37] In Brock's definition of IoT, connectivity occurs between heterogeneous actants. That is, the connectivity of IoT is not merely about connecting objects with other objects, computers with other computers. IoT connectivity is about connecting, or linking, 'objects, information, and people *through* the computer network' (emphasis added). As with any invocation of the ablative (i.e., *through*, *by means of*), there is more to this statement than meets the eye.

In the context of an envisioned IoT, the computer network is an obligatory passage point that links or connects actants (ostensibly through a communicative act of data transfer) from heretofore ontologically exclusive categories: human subjects and non-human objects. One might assume that this connectivity takes the form of information, but such an assumption would be inaccurate. After all, 'information' is included among the heterogeneous set of actants explicitly mentioned by

[37] The terms 'smart' and 'intelligent' are also attention-grabbing, but I reserve detailed discussion of them until Chapter Four.

Brock. As such, 'information' is elevated to the ontological status of 'object.' Even in this early definition, it seems, IoT reduces and flattens extant ontologies.[38]

In order to stress the effects that this ontological change implies, let's think about it in terms of Sesame Street. (I mean this in all seriousness: as Malafouris and Renfrew (2016) noted, we learn to understand the world through things from an early age; as Bowker and Star (2000) argued, humans possess a drive towards classification.) There used to be, and possibly still is, a segment of Sesame Street in which the viewer is asked, 'Which one of these does not belong?' There's a fun song that goes along with it, too. As I recall, something like the following occurs: the viewer is presented with four objects. Three of them are red; one of them is blue. Let's say that the three red objects are a table, a car, and a building. The blue object is a person. In this instance, the blue person doesn't belong because it isn't red. In the land of Sesame Street, the blue person also possibly doesn't belong to the group because it is a person—a living being—while all of the other objects are inanimate.

If one were to approach this same set of images—the table, the car, the building, and the person—from the vantage of the heterogeneous network described by Brock, the belonging or non-belonging of the person would come into question. If all of the referents belonging to the four images are connected to the same network and serve as the field from which to harvest data, then each of them and all of them *do* fit into the same category: they all belong to the category of 'objects.' They *become* objects by virtue of their being sites for data extraction.

[38] That information approaches the status of object is reminiscent of Sartre's discussion of the image in Sartre (Sartre, 2004): where the image presents itself in image consciousness as a whole, so, too, does information derived from IoT. Human perspective is unnecessary for the construction of this information, just as embodied perspective is unnecessary for the construction of the image. In both instances, knowledge production occurs through description (*savoir*) rather than acquaintance (*connaissance*).

Early in life, many of us learned that the objectification of people is, well, bad—morally and ethically unsavory. And yet, in the realm of IoT as it relates to the notion of Big Data, this is precisely where we find ourselves going: into a realm wherein the sanctity of the human as a subject and a subjectivity is all but destroyed. The human, like the car, the table, and the building, becomes just another object-phenomenon from which and about which to gather data.

The act of gathering data, and the fact that such data collection must always already imply objectification, means that the ontological status of the human-as-subject is endangered. Perhaps not endangered in the sense of potential extinction, but endangered in the sense of contamination. Through IoT, we are learning to see the human as an object.[39] As generations emerge subsequent to this process of learning, such learning will give way to naturalization. The human will possibly be naturalized as an object that exists in relation to the prosthetic, parallel subjectivity of networked devices. It is plain to see that the world will be a very different place once IoT is ubiquitous.

And ubiquitous it shall be, or so it is assumed in Brock's quote. Through the inclusion of 'standards, protocols and languages to facilitate worldwide adoption of this network,' Brock further alludes to a process of naturalization. To standardize is to render universal in a given context; to render universal is to insert a layer, a mediation, that in its universality is invisible, infrastructural. That which is infrastructural is ablative and naturalized. (In Los Angeles, and indeed everywhere else I've lived, we don't talk about roads when we travel: we don't say, 'I drove to work on a road.' We might say The 405 or PCH, but the roadness of the route doesn't come up. Roads have been naturalized.) For Brock, and as early as two years after the term 'Internet of

[39] While the objectification of the human has been a practice in one form or another in the fields of medicine, statistics, government, and commerce, I believe the objectification of the human as it occurs in the context of IoT is fundamentally new: it is an objectification that reaches beyond institutional or disciplinary functions and into the daily, mundane lives of the human. It objectifies the human as a human, as opposed to the human as a body, or the human as a citizen or consumer.

Things' was reportedly coined, the vision of IoT is one of standardization, colonization, and ubiquity. The world—the human archive—will be known through IoT, and in being known, will be reconstructed.

What remains to be discussed about Brock's treatment of IoT is his placement of 'the human' in relation to networks of devices. He states that, 'this new infrastructure will allow universal coordination of physical resources through remote monitoring and control by humans and machines.' The placement of the human in relation to computers here is worth noting precisely because it proves somewhat rare in subsequent treatments of IoT. As will be seen, the human becomes conspicuously absent from definitions of IoT as time progresses. In its absence—and ultimately in a Derridean light—the human, then, must be treated as central to the notion of IoT. It is as though 'the human' becomes the unmarked category of actants involved in the production, maintenance, and realization of the imaginaries of IoT. This unmarked category serves as the ground to the figure of IoT. It gives IoT meaning and relevance, but in being the ground, it is taken for granted, poorly defined, and subject to possible ontological slippage. The human ground of 1999 is bound to be different from the human that is implicitly used to ground IoT in 2018. Or 2004 for that matter.

In a similar reference to standardization—albeit an implicit one—Gershenfeld, Krikorian, and Cohen (2004) frame IoT in terms of an Interent-0, rather than a second iteration of the Internet. The notion of an Internet-0 is worth discussing here because it assumes a certain trajectory. It is tempting to see the use of '0' as a programmer's joke: lists do not begin with the number one, but the number zero. But there's more to it than that. Rather than envisioning IoT as an infrastructure built upon or on top of the Internet, the term 'Internet-0' nudges the reader towards envisioning

IoT as something more fundamental than the Internet: something that, like a virus in a carrier, is smuggled. It alludes to the primacy of 'things' over 'Internet' in the term 'Internet of things.'

Being 'Internet-0' places the imaginary referent of IoT at an earlier position in the ostensible sequence of Internet-related technological evolution than the Internet itself, or 'Internet-1,' precisely because it modifies the 'things' which preceded the Internet. In doing so it represents IoT not at a higher level of networking abstraction—something that sits upon the Internet—but as a more granular, more fundamental Internet that reaches more deeply into the experiential world than a network of networks. It is the Internet reaching backwards into the world the preceded it.

'Internet-0' is a retrodiction that looks forward even as it colonizes extant objects and redefines them to the point of erasing their prior inscriptive value. 'Things' are not what they were, but are now and ever have been what they might become—what they are in the imaginaries of IoT. A past is reimagined from a present tense, erasing or super-scribing (as in a palimpsest) that which was known and the ways in which it was known. 'Internet-0,' in superseding 'Internet-1,' declares a fundamental discursive transformation by way of the Internet: the world—the human archive—following the adoption and proliferation of the Internet is fundamentally different than it was before. What was known before through various epistemic modes must now be known through one: that to which IoT gives rise. This is a simple statement, valid even at first glance. But the subtlety of its effects, its implications, deserves close scrutiny.

Simply because of its ordinal relation to the number '1,' 'Internet-0' alludes to a colonization of the extant world by the ontologies, latent epistemologies, and communicative practices of the Internet. The term reaches back into the past, the world of extant technologies and media, and pulls it forward into the present tense—pulls it across the gap between one historical *a priori* and another, thus effecting a process of forgetting: an ontological and epistemic amnesia. 'Internet-0'

signals an implicit identification of a discursive transformation—or superset of discursive transformations—wherein the set of possible statements about the world will always already be filtered through the lens of the retrojective and colonial Internet. It is not a difficult task, I think, to connect this retroactive, colonial archival force with the notion of standardization: the world of Internet-0 (and thus a world that inhabits or inhabited the same sociotechnical imaginary to which IoT now belongs) is/was to be seen through the filter of the Internet itself. Given its implicit uniformity and ubiquity, such a filter can only have a standardizing effect. *La vie en Internet*.

Standardization, broadly construed, is again implied in a subsequent scholarly treatment of IoT dating from 2010:

> The Internet of Things will create a dynamic network of billions or trillions of wireless identifiable 'things' communicating with one another and integrating the developments from concepts like Pervasive Computing, Ubiquitous Computing and Ambient Intelligence. […] The Internet of Things fuses the digital world and the physical world by bringing different concepts and technical components together: pervasive networks, miniaturization of devices, mobile communication, and new models for business processes (Sundmaeker, Guillman, Friess, & Woelffle, 2010, p.44).

The key term here is 'fuse.' But the fusion in which I am interested goes beyond the blending of the little-differentiated scholarly domains of pervasive computing, ubiquitous computing, and ambient intelligence. To marry, to weld, to merge the world of the digital and the world of the physical (assuming that such a starkly implied dichotomy is phenomenologically worthwhile) is again to see the world of the Internet colonize the world as it was prior to the Internet.

The increased networking referenced in their definition of IoT (diminished in scale and therefore augmented in effect) expands the realm of possible statements about the world to include those manufactured through the possibilities of connectivity—connectivity being the core of any possible statement if to make a statement is to say ***x*** about ***y*** or even that ***y*** *is at all* (which is a

notion always already in relation to an assumed *z*, or an assumed subjectivity). This expansion of the set of possible statements occurs purely within the realm of possible connections; just as that realm of possible connections defines in an archival way what can be said, it also defines what cannot be said. If Sundemaaker, et al.'s treatment of IoT is taken in concert with those previously described, then we see an imagined world of IoT wherein the past not only recedes behind us, but disappears as it does so, leaving only reinterpreted traces filtered through strange media: it is to see the invention of the wheel through the experience of looking through a Subaru sideview mirror. This is a realm wherein the past cannot be said at all, but through the statements rendered possible through the discursive transformation that is IoT—the new archive of IoT, the historical *a priori* it will usher in.

Prior to their discussion of 'fusing,' Sundmaeker, et al., provide a more concrete definition of IoT. This definition also bears explication:

> Internet of Things (IoT) is an integrated part of Future Internet and could be defined as a dynamic global network infrastructure with self configuring [*sic*] capabilities based on standard and interoperable communication protocols where physical and virtual 'things' have identities, physical attributes, and virtual personalities and use intelligent interfaces, and are seamlessly integrated into the information network (Sundmaeker, Guillman, Friess, & Woelffle, 2010, p.44).

Here, rather than the explicit mention of 'fusing,' I concentrate first on the signifier 'Future Internet.' This is a crucial notion alluding to the permanence of The Internet. Perhaps it is the absence of either a definite or indefinite article preceding 'Future Internet:' in being neither 'the' or 'a' future internet, 'Future Internet' meets the reader as a foregone conclusion, mana from the heavens that is neither questioned nor considered, only consumed.[40] 'Future Internet,' in a way not

[40] The absence of an article in this instance is not unique: the 'future internet' is rarely preceded by an article in the scholarly literature, as is indicated by the journal of the same title.

dissimilar to the blending of temporalities and histories effected through the retrodictive effects of Internet-0, presents the future-as-Internet-enabled as an immutable assumption: a near religious truth about the way *it will be*.

But such an assumption of the way it will be—Internet-enabled—lacks nuance. It is the absence of nuance that makes it so interesting: we, as scholars, tend to speak and write about the Internet of Things from the vantage of the technical (Bardzell & Bardzell, 2019, p. 3). It is something to be built, something to be engineered and designed. It is too frequently only something to live *in*, *through*, and *with* as an afterthought—in relation to the unmarked category of the human that will reside in this imagined world. The image of the world-as-Internet-enabled comes first, derived from designs and inductions; the human-in-the-world-as-Internet-enabled comes as an after thought: it is to be defined subsequently, an object of the Internet-enabled world.

The technology-heavy approach to IoT raises basic questions. Where are the people (those embodied subjectivities so routinely impoverished and reduced by the application of the term 'user')? Where, too, is the world that occurs everyday, natural and artificial and tacitized and naturalized, in which the complex and often non-sensical actions and communications of irrational actors (i.e., humans) play out in unpublished diaries and thoughts?[41]

These questions, unanswered so far by the definitions of IoT that have been explored, further indicate the need for an interdisciplinary approach to IoT: particularly when the reach of interdisciplinarity extends beyond subsets of comuting disciplines to include media studies, philosophy, literary studies, and critical theory. The realization of path dependent, realizable aspects of the sociotechnical imaginary of IoT should depend as much on input from the

[41] The presence of unpublished materials is increasingly spectral: the notion of publication takes on new meanings when one considers that Google routinely analyzes the contents of private emails; that Facebook does the same for messages.

humanistic fields as it does on the virtuosic feats of engineers, administrators, legislators, and coders.[42] It is, after all, humans (still and again) that will live in the world that IoT co-creates. The world will remain the human archive, but the human that bears the archive will be changed through their relationships with IoT-enabled objects.

These apparently rhetorical—but genuinely stated—questions bring us to the next definition of IoT:

> The Internet of Things (IoT) is a novel paradigm that is rapidly gaining ground in the scenario of modern wireless telecommunications. The basic idea of this concept is the pervasive presence around us of a variety of *things* or *objects* - such as Radio-Frequency Identification (RFID) tags, sensors, actuators, mobile phones, etc. - which, through unique addressing schemes, are able to interact with each other and cooperate with their neighbors to reach common goals (Atzori, Iera, & Morabito, 2010, p.2787).

Again we see a telltale lack of nuance, but here it is found in the mess and tangle that exists between the terms 'things' and 'objects.' These two terms are used side by side as though there is a distinct and known difference between them—a difference that is stated through the presence of both terms, but not defined. But this is a difference that ultimately adds up to a fundamental similarity: there is a greater set to which 'things' and 'objects' belong. Through the transitive property, it becomes possible, then, to argue that the authors view 'things' as closer to 'objects' than 'objects' to 'things.' That is, 'things' appear to have less to do with gatherings of subjects and objects here than they do with standalone objects. In any case, the difference remains implicit and elusive, smuggled in by the conjunction 'or' which gives the reader the impression of a tacit understanding of the differences between the two. This excerpt from Atzori, et al., is the first point

[42] Bardzell, Bardzell, DiSalvo, Gaver and Senger (2012) have made this argument in terms of HCI writ large, as well. Jørgensen (2016) has similarly attempted to situate IoT under the 'big tent' of Digital Humanities. As I have previously noted (Seberger, 2015), however, the usage of the term 'digital' in Digital humanities is problematic such that it emphasizes the technology-first underpinnings of IoT.

at which the true crux of the issue this dissertation aims to address comes to the fore: what are these 'things' that will populate the Internet of Things? And what do they mean—what impacts will they have—for the experience of 'being human?' It is impossible to speculatively deduce the latent and emergement meanings of the future-IoT statement, 'I am human,' in the absence of a discreet and indexical definition of 'thing.'

For the time-being, we'll have to put a dog ear on that question. For the sake of flow, delving into such a rich and troublesome distinction as that which exists between the notions of 'thing' and 'object' is an act that must be put off, relegated to its own section. I will come to a full discussion of that distinction in the section immediately following the remaining definitional explications.

The waters of nuance become increasingly muddy with another treatment of IoT, this time from a scholar housed in the very lab from which the concept of IoT is said to have sprung. Elgar Fleisch (2010) from the MIT Auto-ID Lab frames his definition of IoT with the following questions:

> Is [the term IoT] just another skin around well-known concepts such as ubiquitous computing, pervasive computing, cyber physical systems, ambient intelligence, or technologies such as sensor networks and RFID? If not, what value does it add? And frankly, what is it really? What are its main building blocks? (p.3)

These questions carry with them the weight of something approaching the goal of this dissertation: to question (and begin answering) the meaning of IoT as it plays out in a realm beyond that of the purely technical, where the technical is naturalized to the point that it co-constitutes and trasnforms the human archive.

The question, 'What is it really?' hints at an ontological obfuscation: IoT might be something other than what we, each of us, has in mind when we talk about it. That is, the referent of 'IoT'

hides from view like the body of the elephant to the man who only feels its trunk.[43] But, like a magnet on a refrigerator door, his answers snap back to the technical when addressing the secondary question, 'What are its main building blocks?' (NB: in using the term 'building blocks,' it is possible for the reader to [rightly] assume that humans—or users as they are so often called—fall into this category of blocks, thus reinforcing the objectification of the human discussed above):

> The basic idea of the IOT [*sic*] is that virtually every physical thing in this world can also become a computer that is connected to the Internet. To be more accurate, things do not turn into computers, but they can feature tiny computers. When they do so, they are often called smart things, because they can act smarter than things that have not been tagged (Fleisch, 2010, p. 3)

So, and again, we come back to the technical even if that is not the location or vantage from which we started. Specifically, we come back to the computer as representative of the technical.[44] Still, there is something worthwhile in this definition from Fleisch: as of 2010, at least in terms of this definition, IoT is still envisioned as a more or less one-way street. Objects (and perhaps things, too) are tagged; those tags are monitored (implicitly) by the larger, ostensibly more powerful computers (or humans likely equipped with computers as included in the first definition discussed above) with which they are networked. That is, actors engaged with traditional computers, networked with objects that are augmented by tiny computers, can know something about those newly networked objects, and therefore the subjects (i.e., users) coupled with those objects. In the case of RFID, the likely knowledge gained is about location. Little has been said directly at this

[43] The use of the term 'really' also has an important rhetorical effect: through its use the author implies that much of what is known or has been said about IoT is absent real meaning or purely topical in nature. As we will see in Chapter Five, this is a common rhetorical device in advertisements about IoT.

[44] (Never mind the troublesome ontological value of 'computer,' its historical roots in the punch cards of the Jaccard loom, the human agents [mostly women] who performed professional tasks under the name 'computer,' or the myriad ways in which wicked problems arise through the implementation and proliferation of computer technologies.)

point about the prospect of objects coupled with tiny computers actually gathering data about the environments in which they find themselves.

A return to the notion of 'fusing' a year later (in 2011) will shed some light on this unexpectedly absent aspect of IoT:[45]

> One new concept associated with the 'Future Internet' is that of the so-called 'Internet of Things' (IoT). The 'Internet of Things' describes a vision where objects become part of the Internet: where every object is uniquely identified, and accessible to the network, its position and status known, where services and intelligence are added to this expanded Internet, fusing the digital and the physical world, ultimately impacting on our professional, personal and social environments (Coetzee & Eksteen, 2011, p.1).

Again we find the use of the term 'fusing.' Uncited bibliographic references aside,[46] the recurrence of this word in 2011 sheds much needed light on the then-emerging notion of two-way or ***n***-way communication in the IoT network. The light comes from a close reading of the relationship between the 'physical' and the 'digital' world. But this is not a reading the has much to do with ones and zeros. Rather, it has to do with the role of embodiment in the constitution of the 'physical' world.

To be embodied in the world is to know the world in a certain way. (Vilém Flusser and Luis Bec (2012) treated this subject beautifully in their work, *Vampyroteuthis Infernalis*. Embodiment gives rise to experience; experience bounds the linguistic representation of the world; language provides the basis for the archive: the archive, then, is grounded in the embodiment of the actant that lives in it.) Indeed, the nature of one's embodiment constitutes the boundaries of the world

[45] NB: It is unexpectedly absent from this point in time [2018] because the notion of objects collecting data has become naturalized, or rather I have become naturalized to it either through the research that comprises the foundation of this dissertation or through the act of living in a world where the sociotechnical imaginary of IoT is already partially realized.

[46] This quote appears to plagiarize Sundmaeker, et al., (2010).

'out there' with which a body interfaces. We are in space and therefore in time; if we are in space and time, then we have the ability to recognize such space and time. (This is emphatically not a rendition of '*Cogito ergo sum*,' but rather an attempt to hybridize and synthesize knowing and being, where being is a gestalt that includes embodiment.) This ability to recognize space and time in our (uniquely) human way comes from the form of embodiment that we call 'human,' complete with the occipital lobe (visual cortex) glitches that give rise to tricks of visual perception (e.g., the Phi phenomenon, the meme-based question of a blue or gold dress, etc.) and other such phenomenological oddities.

The same must be said of existing in a digital world. By this I do not mean living as a physical, embodied form alongside a digital world, but rather to exist as a digital object in a digital world: to have an existence that is primarily digital rather than primarily physical. (Surely, as Dourish [2017] has deftly demonstrated, all things digital have mass, have physicality.) If the dichotomy of physical and digital is set up, and if we choose to buy into it, *prima facie*, then certain conditions must be met in order to exist (i.e., to know the world) either physically or digitally. I have briefly outlined those conditions for the physical world above in terms of the human. A reciprocal or complementary category of conditions must be met in order to exist digitally. Where humans have an evolutionarily standardized set of sensual and perceptual apparatuses, computers—or those actants that ostensibly populate the 'digital' portion of the dichotomy—must also have an analogous set of interaction points with the world. That is, they must have inputs and the ability to process or make sense of—to *know* in a loose sense of the word—that which is received from the world, that which they have been designed to receive.[47]

[47] The parallel mentions of Von Neumann, behaviorist-like cognition and more holistic, Gestalt notions of embodied cognition need not be cause for concern: I am not attempting to reconcile them. Instead, I assume that each architecture can be used to create a sensing and perceiving actant. The presence of sensation and perception (whether behaviorist or other) gives rise to functionalist cognition. Two actants functioning under different models of cognition can still be

To fuse the digital world and the physical world requires a massive ontological and phenomenological leap: to render that which we might call the data that comprises the human archive accessible to a digital prosthetic 'knower' and vice versa. It is the recognition of this very leap that has guided the research that will be described in the chapters that follow; it is also the recognition of this leap that allows for the identification of small discursive transformations within the set of discourses that comprise IoT in 2011, and which, at a higher level of abstraction, themselves constitute a set of discursive transformations so significant that they give rise to a new historical *a priori*: IoT-enabled objects, if they are to function as binding between the physical and the digital worlds, must function analogously in the digital world to the ways in which humans function in the physical world.[48] They must have inputs and outputs that mimic, at least, the most basic behaviorist interpretations of human sensation and perception (even where those interpretations have been disproven); they must communicate.[49] In the dichotomy of the physical and the digital which begs a means to communicate between, paradoxically we begin to see the dissolution of the ontological membrane that separates the subject from the object.

This notion of communication across this great (possibly false) ontological bifurcation brings us to the next definition of IoT, which comes from Gubbi, et al, (2013):

> The next wave in the era of computing will be outside the realm of the traditional desktop. In the Internet of Things (IoT) paradigm, many of the objects that surround

compared productively: it is the appearance of cognition—of sensation and perception—that matters here, not the definite mechanisms thereof.

[48] NB: It is again worth noting that the function of IoT-enabled objects is only analogous to that of the human. It is not a one-to-one relationship, but rather a relationship based in functionalism.

[49] It is not the goal of this work to settle questions of sensation and perception. I do not side with the behaviorists, nor do I immediately side with post Cartesians, although I am, admittedly, more in favor of the latter. Questions of direct and indirect perception are simply beyond the scope of this work. Rather, I seek to understand the extent to which new models of cognition might arise from the proliferation of obsolete models such as the behaviorist models that describe the input-processing-output architecture of IoT-enabled devices that collect data, send it to the cloud for algorithmic analysis, and re-present it to the user via some form of interpretable output.

> us will be on the network in one form or another. Radio Frequency Identification (RFID) and sensor network technologies will rise to meet this new challenge, in which information and communication systems are invisibly embedded in the environment around us. This results in the generation of enormous amounts of data which have to be stored, processed and presented in a seamless, efficient, and easily interpretable form (Gubbi, Buyya, Marusic, & Palaniswami, 2013, p.1645).

Sensors at last. Within the context of the physical-digital dichotomy we have as follows: two distinct communicative, knowledge-productive pathways that, save for translational representation of digital information via screens or other modes which allow for readibility in the human archive, remain phenomenologically estranged from one another. The physical cannot be the digital; the digital cannot be the physical if these two ontological categories remain. That which is digitally derived is phenomenologically irreducible to the physical; that which is physical is phenomenologically irreducible to the digital.

And so, even as we seemingly move closer to a definition of IoT, we recede from one that suitably addresses the ontological issues that IoT (and the consideration of the human *in* IoT) raises. With more signifiers comes the need to pin down more referents. With more referents, the question of 'What the (hell) is it?' rings louder and louder. Kranenburg & Bassi (2012) reach a similar conclusion, although it is more softly worded:

> The term 'IoT' was initially used by Kevin Ashton in 1999, and became of widespread use thanks to the work of the Auto-ID Center […]. However, the definition was not given at the time, and although there's a general agreement that IoT involves objects and connectivity, the precise wording is still to be found. (p.1).

As they wrote, 'the precise wording is still to be found.' And how can it have been found when core issues remain unaddressed, spoken in conversation or written in scholarly communication without consideration for what lies beneath the surface: *what are these 'things' of which we speak*?

Take, for example, the following definition provided by The United States' National Intelligence Council in their Disruptive Technology Trends 2025 report: "The 'Internet of Things' is the general idea of things, especially everyday objects, that are readable, recognizable, locatable, addressable, and controllable via the Internet - whether via RFID, wireless LAN, wide-area network or other means' (Swan, 2012, p.217). Things and objects ('especially everyday objects'), objects and things.[50]

Consider the weight of the institutional prognostication that comes with 'Disruptive Technology Trends 2025.' This document, the document in which the previous definition is found, is not an opinion piece causally published on someone's blog in some corner of the Internet as we now know it. Rather, it is documental evidence of a governmental institution considering what we might expect in the year 2025; it is evidence of the foregone conclusion of IoT, its reified status as a future certainty despite the apparent absence of an understanding of those parts that might constitute it. And this is ridiculous.

How can a future possibility be treated as a certainty when that which is at the center of it—'to the things themselves!'—remain undefined and largely unconsidered by the very scholars and researchers that are charged with its design? We are left with the vague (and vaguely unnerving) statement, as if from an engineer-turned-fortune-teller, 'This infrastructure we are building will exist, and it will proliferate, but we don't really know what it is. Nevertheless, we're building it anyway." What could go wrong?

As we approach definitions written in the present tense of this dissertation, we come not to a clean or clear-cut definition of IoT, but rather a definition that buzzes with neologisms that work to further obfuscate those core notions of 'things' and 'people' that must certainly play an important

[50] One wonders why we have not simply reverted to using 'stuff'? Surely there must be a meaningful distinction between objects and things, but where is this in the literature?

role in any definition. In the rush to plant flags in new terrain, we have forgotten to remember the constitution of that terrain.

Consider the following from 2014: "IoT refers to an emerging paradigm consisting of a continuum of uniquely addressable *things* communicating one another [*sic*] to form a worldwide dynamic network" (Borgia, 2014, p.1). The author continues at length:

> a *thing* can be any real/physical object (e.g., RFID, sensor, actuator, spime, smart item) but also a virtual identity/digital identity, which moves in time and space and can be uniquely identified by assigned identification numbers, names and/or locatable, addressable and/or controllable via Internet. Moreover this new generation of devices is *smart* thanks to the embedded electronics allowing them to sense, compute, communicate, and integrate seamlessly with the surrounding environment. The association 'one device/one function' disappears, but the whole set of objects becomes the place where the function is activated, resulting all widely distributed (*sic*) (Borgia, 2014, p.2).

With an eye to the future, the development of IoT into a ubiquitous system of systems, the author continues:

> Smart devices will form the so-called *sensory swarm* and will be the majority of the system. They will be extremely heterogeneous in terms of resource capabilities, lifespan and communication technologies. They will exceed classic devices such as smartphones and tablets, which, on the contrary, will form a way of accessing Internet. […] It is envisaged that the number of connected things will exceed 7 trillion by 2025, with an estimate of about 1000 devices per person. A part of them will be wearable, but the majority will be in the infrastructure. In this vision, humans will be completely immersed in the world of technology, leading to the so-called *Immersed human* (Borgia, 2014, p.2).

The treatment provided by Borgia above is worrying. In many ways, it plays into the 'by 2025' framework for IoT: in this framework, wherein '2025' stands as a variable for a proximal future, IoT exists as a technotale, but one that puts the cart before the horse, so to speak. Borgia indicates

that there may be as many as 1000 devices per person.[51] These thousand devices are characterized in contrast to 'classic devices.' That is, they receive a negative definition rather than a positive one: they are 'not ***x***' where ***x*** refers to classic devices. The only way in which this category of 'not x' devices is positively defined is through the use of the following phrases: 'extremely heterogeneous;' 'wearable;' and 'infrastructure.' But this heterogeneity still exists in contrast to 'classic devices,' indicating that the heterogeneous devices of the IoT-future of 2025 will not share the standard, naturalized characteristics of smartphones and tablets.

There are a few interesting things happening in this statement. First, one can only assume from this negative definition of the future devices in question that the means of interaction between the human subject and the IoT-enabled object/device will not resemble those means of interaction available to the user of a smartphone or a tablet. Second, the means of interaction between the subject and the object/device will still, in part, occur through the embodied physicality of the human subject. This much is implicit in the idea that some of the myriad IoT-enabled devices that will populate the future of 2025 will be wearable. To be wearable is to be interactive with the body or characteristics of the body-in-time, the body in motion—inner or outer, beneath the skin or beyond it. The third—and this is perhaps the most interesting and troublesome—is that these devices will either be part of what we now recognize as infrastructure or will form a new layer of infrastructure, a new type of it. It seems as though we expect the naturalization of a new set of objects about which we know very little in terms of their sociotechnical specifics.

With regard to the nature of the infrastructures implied in Borgia's definition, I tend toward a mix of known infrastructures and new infrastructures. I do so for the following reason: as Star and

[51] It is unclear whether or not the author means that IoT-enabled devices will outnumber humans 1000 to 1 or whether or not each user who has enrolled into the sociotechnical imaginary of IoT will be connected to 1000 devices.

Ruhleder argued (1996), infrastructure generally becomes 'visible' when it breaks down. A brief deconstruction of this statement indicates that the ontological category of infrastructure of which they wrote is perceptible by the visual pathway, or indeed any one of the sensorial inputs available to humans—assuming that the authors used visibility as a metaphor. This is not necessarily the case when it comes to an infrastructure born of IoT-enabled devices.

I will argue this point in-depth later, following a close reading of articles by Ashton and Gross, but in service to making a point at the present moment, bear with me for a foreshadowing summary: infrastructures such as roads, telephone wires, and electric grids all have functions and characteristics that are recognizable to the human. That is: the ride is either bumpy or not, the route passible or impassible; the disembodied voice is either heard or unheard; the lights turn on or they do not. They are human readable (and therefore potentially visible or rendered non-tacit through breakdown) because the human user of that infrastructure is embedded in the infrastructure itself: they are part of the flow of information that the infrastructure allows. This is not necessarily the case in an IoT infrastructure—at least not completely.

In instances where IoT infrastructure is concerned with machine-to-machine communication, a non-functioning, malfunctioning, or hyper-functioning (Seberger & Bowker, In Press) infrastructure may go completely unidentified, unperceived because it is embedded in such a way as to be permanently invisible to the human actor.[52] Breakdown or any form of non-optimal functionality might only be perceived at several steps of remove or following catastrophic failure of a system—in terms of a system that combines both humans and objects in the achievement of daily activities, catastrophic failure might occur in the philosophical realms of ethics and ontology and epistemology.

[52] One needs only consider the recent fatal flaws of the software and sensors in Boeing 737 Max 8 to get a feel for the human blindness towards certain forms of infrastructural malfunctioning.

And, yet, this new layer of IoT infrastructure is still, ostensibly, tied to the body of the subject-user. As Borgia wrote, 'a part of them will be wearable.' Thus, there is reason to believe that the very relationship between the human body—the body of the user—and the infrastructures upon which an imaginary is translated into a functional, shared world (not unlike a system of material grammars) will be fundamentally changed. At the very least, this is a logical possibility. As such, it must be addressed and accounted for.

In order to account for this possibility—in short, to begin to know into what the discourse of 'human' might transform—we must return to basics. We must address the relationships between the notions of user, subject, object, thing, standardization, the fusing of the digital and the physical, and infrastructures that have, up to this point, played a large role in beginning to define just what IoT is.

But Borgia is not the only one thinking in 2014 of the near future of IoT.[53] In an outlier-like bit of writing authored by Stankovic (2014), the role of the human in IoT—or one possible understanding of that role—is made explicit. It takes the form of what Stankovic calls a "human-in-the-loop" architecture:

> As IoT systems proliferate, they will become more sophisticated. Many of these new applications will intimately involve humans, i.e., humans and things will operate synergistically. Human in-the-loop systems offer exciting opportunities to a broad range of applications […]. Although having humans in the loop has its advantages, modeling human behaviors is extremely challenging due to the complex physiological, psychological, and behavioral aspects of human beings. (Stankovic, 2014).

[53] Similarly, in an article entitled 'An Internet of Social Things," Nansen et al. (2014) call for a need to better define the user in IoT in terms of material and technology studies: the extent to which the human experience distributed across users and objects.

Where the human user is specifically considered, s/he is considered through a primarily technical lens. The notion of 'humans-in-the-loop' presented by Stankovic (2014) above, serves as another example of this. The author argues that a qualitative change will occur at the point at which "things" are saturated with actuation and sensors, thus creating a '*smart world*.' A characteristic of this qualitative change, Stankovic posits, is that '[m]any of these new [IoT] applications will intimately involve humans, i.e., humans and things will operate synergistically' (p.7).

But, 'Humans in the loop' designs appear as an afterthought and fall prey to the same unknown discursive delta described above. The human in this loop is still operationalized in a highly reductive way as a 'user'—someone to be modeled and enrolled into systems of 'smart' things. Just as smart things are elevated to the status of proto-perceptual, people are conversely demoted – creating an ontological flatness. That such a concept as 'humans in the loop' needed to be operationalized implies that humans were not already 'in the loop.' It puts the cart before the horse, or the 'thing' before the human, as it were. The 'thing' remains blackboxed; the human user remains an agent to be retrofitted there-to. Constructing a broader, deeper, and more explicit theorization of 'things' in IoT can help circumvent these problems of operationally impoverished users, and therefore re-orient the study of IoT in such a way that both subjects and objects receive equal attention. Doing so will help ensure that the emergent meaning to be found in the future statement, 'I am human,' are not wholly out of line with humanistic values.

But the point here is not to view IoT solely through the lens of the potential human subject. In viewing IoT through exclusively either the lens of the subject (the user) or the lens of the (smart) object, we execute a catastrophic reduction. The meeting point of the artifactually rich objects that populate our lives and the experience of those lives exists at best as specters that lurk somewhere beyond the 'scope of this [or that] article,' or as calls for further study. The sociotechnical complexity of IoT—the extent to which IoT will impact the very discursive structure of the human archive—is concealed in either approach. Just as

infrastructure itself recedes into invisibility by virtue of being infrastructure, the *life*—the phenomenal, the experiential, the ephemeral—to which IoT will ostensibly contribute is conspicuously invisible in both object- and subject-oriented approaches to IoT. Both must be addressed and accounted for simultaneously.

In a shift away from the future framing of IoT—perhaps as a result of the temporality of the discipline from which it arises—recent legal research into IoT frames it in the present tense:

> The Internet of Things (IoT) is here, and we seem to be all in. [….] We have become drunk on our ability to connect anything to the Internet. Barbie dolls, baby monitors, coffee pots, refrigerators, clothes, watches, and cars—we have connected it all. It seems there is nothing we cannot improve by sticking a chip in it (Hartzog & Selinger, 2015, p.581).

For all the potential of IoT, the deep and lingering questions it raises pertaining the nature of being human in an increasingly mediated world, IoT can also occupy the same space as the toaster than also makes julienne fries: superfluity.

In one of the first scholarly books attempting to situate IoT within a discipline outside of engineering and computer science, Bunz & Meikle (2017) approach IoT from the perspective of communication studies.[54] Insofar as the work comprises a primary entry point for communication (and media) scholars into the realms of IoT, it should be seen as worthwhile. Moreover, the authors should be lauded for what is surely a Herculean task if undertaken with due consultation of the fields IoT touches: if the 'thing' in IoT, as I theorize, always refers to a subject-object coupling, then IoT is predicated on some form of communication. To commune is to relate in a translational; to couple is to relate in a transformative way.

[54] There are a few books on IoT that predate Bunz & Meikle's contribution. Several of the more scholarly editions belonging to this set are covered in suitable detail in a review also penned by Bunz [2016].

Bunz & Meikle (2017) approach the things in IoT based on what they refer to as 'skills.' That is, capabilities possessed by objects by means of their being networked and sensor-laden. For the authors, the things in IoT see, hear, and talk. They posit that these objects' skills—a highly problematic and rich postulation in and of itself that must be more deeply situated within the discourses of ANT and science studies—present new arenas or modes of communication. On the one hand, such new forms of communication occur between subject and object outside the tactile domain. Users speak to and with Amazon's Alexa or Apple's Siri. (In speaking with, users also listen.) So, we see that IoT involves not only subject-to-object communication, but also object-to-subject communication. The authors go on to highlight that a third realm of communication is also made possible via IoT: object-to-object communication.[55]

These three skills appear to provide interesting in-roads for communications-based analyses or interpretations of IoT. But the appearance is a fleeting one. As is the case in previous mentions of 'things' and the 'fusing' of the physical and the digital, the reader is left staring into an abyss: What are these things? Why rely on such a dichotomy?

The discursive transformation that IoT heralds is one so strong that it renders even basic assumptions—those definitions of 'things' and 'skills' and 'objects' that might otherwise remain tacit and functional—troublesome. If we are to move further in the direction of knowing what we as humans are becoming, then we cannot let these assumptions rest. We must trouble them. We must analyze them and understand them.

A fair amount of work has been published pertaining to the Internet of Things since 2016. As IoT-enabled devices make their way more and more into the daily lives of humans, so too have

[55] Again, given the present project's focus on the role of the human in IoT, object-to-object communication is largely ignored because all object-to-object communication must ultimately involve some kind of human recipient of information. Pure object-to-object communication is a fallacy.

they made their way into secular publications and non-print media. Many of these stories—too many to note individually—address failures of IoT-enabled devices, ethical concerns, and privacy issues. The same can be said of the scholarly literature that has been produced since 2016: while these articles do, in some small way, make the move from analyzing IoT as purely technical phenomena to discussing IoT-enabled devices 'on the ground,'—as in, say, factories, homes, and cities—they ultimately contribute to a structure built on sinking sand. That is, deep questions remain as to the nature of 'things' at the core of IoT, as well as the reductive operationalization of the human-as-user. What this means is that the discursive structure of both 'human' and 'things' has gone undefined, undescribed. In the absence of such definition and description, the technical continues to outweigh the social: the place of the human in the imaginary of IoT remains largely obfuscated.

It is not altogether surprising that the discursive construction of the human, as it relates to IoT, is unknown. (That 'things' are as murky as 'the human,' however *is* surprising.) The blackbox of 'the human' presents as unsurprising because of the extent to which IoT-related research—particularly research endeavors that come from the tradition of HCI, CSCW, and the other social-science-leaning areas of information and computer science—is grounded in laboratory methods, or the scientific method writ large. The inherent confound that presents in the form of external validity must be discussed before we can move on. To do so, I will return focus to the notion of humans-in-the-loop presented by Stankovic (2014).

In order to address the notion of a human in-the-loop, the human must be operationalized. Easy enough: the human is a user. This is a remarkably reductive move that defines the 'human' purely in terms of their interactions with a given 'loop,' or a given set of networked objects. Given the implicit breadth and ubiquity of networked objects—the lurking visage of the 'by 2025' framing—

it is relatively easy to imagine that a human operationalized as a user in terms of their relationship to ***x*** set of nodes in a network is not a suitable operationalization of a human in terms of their relationship to ***i*** sets of other nodes in the same, sprawling network. Put more directly: if one were to operationalize me as a user in terms of my relationship with my FitBit Alta HR, that operationalization would not suffice if it were used to describe my relationship to my Roomba, my car, my smartphone. Indeed, the user that is operationalized based on my relationship with the FitBit Alta HR is a human that does not exist anywhere outside of that relationship, save for the userly schizophrenia that arises when I am distributed and operationalized across each of the IoT-enabled devices with which I interact on a daily basis. While I am clearly a 'user' of each of these devices, my use of them varies radically, as does my relationship to the types of data that are collected and disseminated based on my use of these devices. The sum of these operationalizations, while approaching some kind of IoT-Gestalt, does not approach a proper or representative operationalization of me beyond the scope of IoT.

Let's focus on the Roomba for the moment. I, like many other Roomba users, schedule cleaning daily. I usually schedule cleanings in the middle of the day when my cat, Linus, is sleeping. (He despises the Roomba, if cats can be ascribed the human ability to hate.) As such, I often receive updates via my phone that inform me that my Roomba is stuck (usually under the door of my refrigerator) or that the dustbin is full. I am frequently in different social situations, different environments when I receive these notifications. While I am a 'user' of the Roomba—in the strictest sense—I am a moveable user. I am not who I am in social situations when I am alone in a room with my Roomba. My status as 'user' bleeds into other situations through the receipt of updates; I am interrupted, I am stretched.

The Roomba (as a stand-in for other IoT devices) reaches into my life via the operationalization of me as a 'user' of it and effects a change, but it is not a two-way street. I begin moving furniture to ensure that the Roomba can do its job; shoes are no longer left on the mat by the door, but are kept on a shelf; a row of laundry detergent containers form a barrier between the hallway and my home office (I do not trust the Roomba, Jeeves, around the power chords streaming from my various devices; nor do I want to spend nearly one hundred dollars on an additional, iRobot brand electronic fence). I am configured as a user—a different type of person—based on the requirements of my Roomba and my desire to have a Roomba (and my dislike for vacuuming). But the Roomba, precisely because it is smart in a dumb sort of way, cannot bend to my will: in using the object, I become the used.

The operationalization of the human as a 'user' begins from the vantage of the device that is to be used. What is required—must be required—if the potential discursive transformations that IoT will surely effect are to be understood, is a variant on infrastructural inversion (Bowker, 1994). The human must not be operationalized from the vantage of the device so as to construct a user. Rather, the device must be operationalized in terms of the human in all of its rich connotations in order to construct a 'thing.'

In this line of thinking, 'things' begin with people before people can be reduced to the operationalized (idealized) 'user.' 'Things' are wild and in-situ and *in relation* to the humans that, as irrational actors, emotionally driven weirdos, depressives, obsessives, artists, moms and dads, drunks, gym rats, interact with them *so as to make them things.* If, as Latour has noted (1993), 'things' are a gathering, then the nature of the gathering must be understood. Importantly, this is not a 'nature' that reflects some kind of ground truth: it is a relative nature. Its nature is relativity.

By this I mean a nature that must be defined in terms of values and ethics, a decision to approach the question of 'things' not in hopes of finding an ontologically pure definition, but rather a definition that serves that particular species whose lot it is to define, organize, and understand. It is perhaps for the reason of this absent infrastructural inversion that such ontological mud envelopes the differences between 'things' and 'objects' that we have heretofore seen in the literature. As I describe in the methods section of this dissertation (Chapter Three), it is the goal of my chosen methodological toolkit to begin the operationalization of 'things'—these slippery devices born of IoT—from the vantage of the human.

What remains to be said—prior to summarizing remarks—in terms of this definition-centric, narrated and critiqued laundry list is difficult. It is difficult because it concerns two pieces of research that are very close to this one—or parts of this one. It is not specifically that they are similar that makes them difficult, but rather that they were executed in such an unsatisfactory way as to render them almost meaningless in the broader ecology of research pertaining to the discursive structure of the Internet of Things and IoT's potential impact on the discourse of 'the human.' First, we must address a relatively fine study, based in the application of distant reading; second, we must address a patently self-serving chapter published by a known predatory publisher (IGI-Global) (Bogost, 2008; Eriksson & Helgesson, 2017).

Bian, et al., (2016) published a promising piece of research in PlosOne. Their article, entitled, 'Mining Twitter to Assess the Public Perception of 'The Internet of Things,'" first appears to be exactly what the doctor (this doctor?) would order: a distant-reading-based lay of the land regarding definitions of IoT, discourses implied in the construction of IoT, and maybe, just maybe theoretical contributions to the scholarship of IoT. While the methods used by Bian, et al., are

sound—even innovative in their application in this domain—the article manages to say remarkably little that is of interest.

As I devote a substantial amount of space to the discussion of this article in Chapter 3, here I will go no further than this: "smart technologies," "connected device," "emerging security," "industry leaders," "changing business," and "big data" are the topics the authors derived from the application of LDA analysis to a set of tweets. These are a fine starting point—and, indeed, they validate in a limited way some of my own findings presented in Chapter Four—but the authors go no further. The final product stands, then, as a monument to the need for interdisciplinary approaches to IoT research. It is simply not enough to have talented (even extraordinarily talented) information scientists and coders working on IoT research. Rather, what is needed is a combination of such experts with experts in the humanities: humanists capable of interpreting these topics and situating them within the greater tradition of intellectual history. Otherwise, the research products cannot possibly address the sociotechnical, but only the technical or the social in isolation—a theoretical state in which neither term retains any meaning.

Now, onto the predatorily published 'Rise of the Non-Human Actors: The Internet of Things" (Tatnall & Davey, 2015). It may seem odd to include a discussion of a chapter that relies heavily on self-citation and Wikipedia entries. Indeed, it is. But the nature of the chapter in question—its disharmony with what one might refer to as traditional and rigorous scholarship—says more about contemporary approaches to the Internet of Things that the actual content of the chapter.[56]

As a short summary: the piece in question attempts to discuss IoT-enabled objects from the perspective of Actor-Network Theory. Surely, and at first glance, this is a valid approach. ANT,

[56] Sadly, a great deal of IoT literature appears in formats similar to this. Predatory journals abound; scholars are tempted to stake their claim in IoT quickly. While I will not name names, it is not an involved task to seek these works out by conducting simple Google searches or Amazon searches.

after all, has long been used to understand the relationships between human and non-human actors in the production of scientific knowledge. But things fall apart—pun intended—when the authors fail to address the notion of 'things.' Given that they intend to rely on ANT, this is an unforgivable omission: Bruno Latour has devoted many a page to teasing apart the definition of 'things.' Since Latour resides as a sort of centroid in the ANT world, the absence of a discussion of his treatment of 'things' demonstrates the haphazard construction of the chapter in question. But it is not my intention here to provide a post publication peer review of Tatnall & Davey, nor to browbeat them for (ostensibly) trying to survive in the competitive, 'publish or perish' world of academe. Rather, the chapter, in all of its shortcomings and haste, resounds with harbingers of shortsightedness to come.

This failure to live up to potential—to be subjected to careful thought, peer-review, reflection, etc., thus allowing for the creation of a genuinely interesting and meaningful piece of scholarship—stands as a sort of metaphor for the state of IoT research as it pertains to the future of the human. How can we argue for or against, imbue IoT with suitable values and humanism, if we do not take the time to truly understand the conceptual stakeholders active in IoT? How can we meaningfully envision a future of rampant connectivity, tiny computers embedded in daily objects, actuators and sensors silently communicating in a realm wholly nonhuman when we do so—and are pressured to do so—in a slipshod way?

In the remaining sections of this dissertation, I take these oversights very seriously. I ground the remainder of this literature review in canonical pieces of IoT literature, as well as deep readings of the term 'things.' We cannot (or perhaps should not) rush into a future wherein the sociotechinical imaginary of IoT—as assumed, limned, but never defined *modus operandi* for the

mode of being that will constitute 'the human'—is realized without first understanding just what these 'things' are.

Here at the end of this more or less traditional literature review in which I have attempted to be both descriptive and productively critical, it seems that we are left with more questions than answers. This is ultimately good for someone writing a dissertation about IoT—lots of gaps in the literature—but frustrating for any one of us (I, you, they) who will live in this future of IoT wherein such a muddy and muddled set of operationalizations will be realized in part or in full.

We are left with questions pertaining to: the difference between 'things' and 'objects' in IoT; the relationship between 'the human' as we know it now and 'the human' as it will be known in the world of IoT; the place of 'the human' in relation to 'things' and 'objects' in the world of IoT; and the validity of dichotomies like 'human/computer' and 'subject/object.' In order to answer some of these questions, or to begin answering them, I turn to another, brief but broad literature review of terms that appear in IoT-related literatures: spimes, biots, and fluid assemblages. Following that discussion, I engage directly with the term 'things' as it is treated outside of IoT research. Finally, following that discussion, I will direct our attention to close readings of two canonical pieces of IoT literature: Kevin Ashton's "That 'Internet of Things' Thing" and Neil Gross's "The Earth Will Don an Electronic Skin."

2.3 IoT literatures: Spimes, Biots, and Fluid Assemblages

There are, in addition to those scholarly works that emerge from IoT-specific domains, other works that are relevant to the framing of this project. Generally, they come from the areas of design

and popular science or futurism. Often, there is significant overlap between these categories. As such, I will treat them as one here.

Three concepts come to mind as those that stand out from the crowd: spimes and biots (Sterling, Wild, & Lunenfeld, 2005); and fluid assemblages (Redström & Wiltse, 2015, 2018). Another, skills (Bunz & Meikle, 2017), has already received some brief coverage in the earlier part of this chapter. It should, however, be stated again that this skills-based treatment of IoT stands out from the literature in that it comes from an attempt (albeit a limitedly successful one) to frame IoT in terms of the field of communication. In combination, these four concepts or approaches to IoT indicate that there already exists a small cadre of researchers, perhaps unknown to each other, who are working on topics pertaining to IoT in different disciplines.

In this short section, I will focus on treatments of IoT that arise from the field of design. I do so because design—that great practice that can be uniformly applied to almost everything (Latour, 2008)—has more to do with humanism and the nature of objects as they relate to the human archive than one might first expect. As was my approach in the section preceding this, I will address the notions of spimes, biots, and fluid assemblages in chronological order of when the works containing them were published.

2.3.1 Spimes

The concept of a spime was first put forth by the science fiction author and futurist, Bruce Sterling in a short manuscript entitled, ‘Shaping Things.’ Spimes are difficult things to get your head around. This is largely because they do not exist. That is, the spime is a projection of ‘things’—operationalized in a fairly loose way, as will be made apparent in the next section of this

chapter in terms of the work of Heidegger and contemporary interdisciplinarians concerned with the philosophy of 'things'—into an imagined future. This imagined future shares many of the central characteristics of IoT. Most notably, Sterling's imagined future is predicated on ubiquitous connectivity not only for humans in terms of communication and access to information via The Internet, but in terms of non-human actants. Spimes, according to Sterling, are objects that are fully integrated into this imagined future. They extend beyond themselves in that their 'thingness' is not predicated on the physical characteristics of the would-be object. Spimeness, rather, is predicated on flexibility and information and the extent to which such flexibility will be a ubiquitous functional feature of society writ large.

I will approach spimes in a somewhat roundabout way. Whereas Sterling, defined spimes through a slow reveal, I will start from the ending: we will be surrounded by ambient technologies to the extent that the technologies will disappear. They will be like air to the mammal; like water to the fish. In fact, much of the discussion surrounding spimes often occurs through metaphors of air and water. There is talk of technology fogs, technologies mists, and The Cloud. These metaphors arise in the context of spimes, I think, precisely because of the physical characteristics of air and water: they are fluid.[57] They take on the shape—if air can be given a shape—of the containers in which they reside. But there's more to it than that.

Air and water, the stuff of fog, mists, and clouds, are elemental. They are so deeply infrastructural that they are not considered infrastructure; they are so deeply mediating that they are not generally approached as forms of media. (One notable exception is the groundbreaking work of John Durham Peters [2015]). In speaking of the existence of spimes, of futures objects,

[57] That the metaphors of future computing take on environmental characteristics also implies a fundamental change in the condition of the human archive: our environment is changing not only because of anthropocentrism, but because of our technological extensions. The human archive—the archive defined by the reaches of human embodiment—changes with it.

via elemental metaphors, we are speaking of an imagined future where these technological objects are also elemental: a future that would not exist but for the diffusion and ubiquity of these objects, of their reification as primary elements through their ubiquity. We speak of a future that could not possibly exist but for the elemental nature of the spime. So, then, we see that the spime is just that: the logical conclusion of a current technological vantage, wherein those characteristics that we speak of when we speak of IoT—connectivity, sensors, actuators, data collection, global positions sensors, RFID—are no longer worthy of note precisely because they are everywhere. They are like water, like air, like paper, and (increasingly) screens. The spime itself becomes a metaphor for the future in which it exists, the future it creates through the imagination of the spime.

So what do these spimes look, feel, and act like? According to Sterling, they look, feel, and act like you want them to. Simple as that. Spimes are never 'complete.' Therefore they never obsolesce. There is not final shape or purpose to a spime: they evolve with the needs of their user. (Sterling refers to users of spimes as 'wranglers.') Spimes are amorphous and flexible. They are fluid and updatable—but they are not updatable in the sense that they must be updated so as to avoid obsolescence. The very nature of the spime is updatable: it is ever present, ever on the bleeding edge: they are the universal Turing machine worn on the wrist; an end-all be-all of design and functionality.

Sterling envisions spimes as objects whose functionality and newness last for the duration of the user's life. They will adapt and change—grow—along with the user. The means by which they adapt and change to their users' needs is their connectivity, and therefore access to the world of information that will be held on The Internet.

I say 'will be held on The Internet' not in an attempt to deny the current value of Internet-based information. Rather, because of another central tenet of spime-future: in Sterling's future of

spimes, the map has become the terrain. The world of spimes is one in which the human archive has reconfigured itself based on the vision of IoT rather than IoT configuring itself to fit the characteristics of the current/past human archive. As he writes, "In a SPIME world, the model *is* the entity, and everyone knows it" (Sterling, 2005, p.96).[58]

It is relatively easy to see why the concept of the spime was so popular around the time of its publication: it is what you want it to be. But this is also one reason why I will not rely on the concept of the spime in my analyses that follow. A spime can only exist in a society that is designed through the use of spimes. This is a ridiculous tautology, the proponent of which, must rely on the possibility of achieving a utopian society. I call this ridiculous because I know no other word for the possibility of a utopia. Utopia and Dystopia exist as polar ends of a spectrum, often perceived of as a dichotomy, and by their very existence as ideals ensure that they will never be achieved, but rather that the real world can be compared to them in an indexical way.

Now, this is not to say that certain characteristics of spimes will not be realized in the form of consumer goods, of the objects with which we will surround ourselves in the future. Frankly, many of the qualities of a spime—save, perhaps, for rapid obsolescence—are present in smartphones. But the idea that a 'spime world' (Sterling, 2005) will emerge through the use of spimes, which can only truly exist in a spime world, only makes sense in a future tense that drops from the sky like so much unquestioned mana: the spime is just one potential future that might emerge from the imaginary of the Internet of Things. In that this particular future resident in the imaginary of Internet of Things is predicated on, well, 'everybody getting along'—the abandonment of large-scale consumerism, which would mean an absence of corporate competition, and likely corporations altogether, for example—it dooms itself. Sterling wrote that he expected this spime

[58] It will be worth bearing this idea in mind in Chapter Five of this dissertation: the notion that the map becomes the world is a useful way of thinking about the Flusserian notion of 'technical images.'

world to arise within thirty years. That means 2035. We're half way there, and the world is already a much messier place conspicuously defined by antagonism, power differentials, and corporate greed. (Not to mention disinformation.)

But there is an important lesson to learn from Sterling's prediction: we should not predict. Prediction at the telescopic scale of the subject-object relationship is not worthwhile if it results in a descriptive statement like '***x*** will be ***y***.' What is required instead is not prediction, but forecasting. One needs not (and should not) say that '***x*** will be ***y***,' but rather operationalize ***x*** as a discursive constellation—a matter of concern (Latour, 2004)—and speculatively deduce a set of discursive transformations it may reasonably undergo in order to create and define a set of potential discursive constellations (***y***).

What is required for the completion of this act is a non-reductive operationalization of 'things.' Or, if reduction cannot be avoided, a limitedly reductive operationalization such that that 'thing' is understood in its most basic way.

2.3.2 Biots

In addition to (ostensibly) proposing what he calls a 'metahistory' approach—which bears a remarkable resemblance to Foucauldian archaeology, but lacking the nuance—from which he derives the object-historical march towards the spime, in 'Shaping Things,' Sterling also coins the term 'biot.' Although the word is new, the concept is not. 'Biot' ultimately refers to the human as she might exist in a world where the singularity—that equally ridiculous notion when it is assumed that objects will become like people through the development of AI—has been achieved. The biot

is a blend of the human and the spime; a blend of the human and the technology they (whether directly or through outsourced, prosthetic means) design.

Sterling writes: “A Biot would be the logical intermeshing, the blurring of the boundary between Wrangler and SPIME. This is happening now, but we can’t perceive and measure it” (Sterling, 2005, p. 134). In the first sentence, Sterling indicates that a biot will be a blend of the user and the used. This idea gives the vague impression of un-cited phenomenology: Heidegger, Merleau-Ponty. It also comes with a hint of linguistic discourse analysis, as in the work that Bruno Latour has done tracing the roots of the word ‘thing:’ the thing is a gathering again (Latour, 2012).

To say that we can’t perceive the emergence of the biot or measure it is both a cop out and an epistemological category error: as I will argue in the next section of this chapter, via the work of Heidegger, we cannot reasonably expect to measure the thingness of ‘things’—whether they are spimes, biots, or anything else—via the type of quantitative scientific inquiry that seems to reside behind Sterling’s use of the term ‘measure.’ To say that we can’t perceive it, but to write a book about the fact that it is happening, is either a fatally self-inflicted wound that negates the author’s entire text, or it is intellectual laziness. If we can say that it is happening, then we must be able to perceive of it in some way. One gets the sense that the author is throwing around words—borrowed from continental philosophy, psychology, sociology of science—of which he has a fairly limited grasp; or that he assumes his reader is completely naive.

The funny thing about biots is that they already exist. So, to an extent, Sterling is correct when he says ‘This is happening now’ (p. 134). They have always existed. The human is only a human in relation to the objects that populate their world and the actions that can be taken by means of those things. (This is the basis for the human archive.) If to be a biot is to be fully integrated with the digital technologies we have created, then we can reduce that statement to the idea that a biot

is one possible configuration of human and object. Humans have always been configured in a discursive way in relation to their objects. We have always already been biots just like we have never been modern (Latour, 1993).

Although I find the concepts of spimes and biots to be of somewhat limited use, perhaps other than as an illustration that there are, indeed, specific and observable futures that reside in the general imaginary of IoT, Sterling deserves a little more attention. He has written a surprising amount about IoT. Notably, his works generally fall outside of the scholarly cannon: they have vaguely scientific characteristics, but these are likely a result of his chosen topic. It is simply difficult to write about IoT or any contemporary, technological developments without intentionally or unintentionally donning the mantle of 'science.' The problem with this is that there is no way to gauge Sterling's findings or predictions. They benefit from the appearance of science, but do not benefit from the scientific quality of verifiability.

In his The Epic Struggle of the Internet of Things (Sterling, 2014), for example, he makes the argument that IoT will herald a new version of feudalism. He identifies a group of corporations—what he calls the Big Five—as the likely lords of the manners of the future. The rest of us, the users, will be toiling in the fields of the digital, providing massive amounts of data for their use. *Prima facie*, this seems possible. But it seems possible in the same way as the utopian view of IoT futures the lurks beneath the surface of spimes: impossibly possible; reductionistically possible as in a forced choice question. Moreover, in being a dystopian view it highlights, by comparison, the author's tendency towards one end of the spectrum or the other: towards utopia or dystopia.

In actuality—and this is as close to a prediction as I will come—what will happen is neither utopian or dystopian. The future will be mixed and muddled, a confusion of utopian and dystopian characteristics. That is to say, the future will the much the same as the present. *Plus ça change,*

plus c'est la même chose. The world will still be a world bound by history; in being bound by history, it will be a world of discourse; in being a world of discourse, it will be fundamentally similar to the world we know right now at this very moment grounded in human embodiment and the languages and images embodiment renders possible. But the discourses will be transformed in some way, or they will have the potential to transform. The human as a physical animal (as well as an historical discourse unto itself) will still have to live among the slow swirl of the discursive tide pool. In the words of David Byrne and Brian Eno during their Talking Heads years, 'there is water at the bottom of the ocean,' and 'same as it ever was.'

2.3.3 Fluid Assemblages

So, in light of the problems that characterize the otherwise fascinating works of Sterling and similar futurists, we are left looking for something, some way of describing the potential discursive transformations that IoT heralds in the form of imagined futures, that is located between pure speculation and too-reductive approaches that do not allow for any real future at all.

An inspirational approach is found in the work of Johan Redström and Heather Wiltse (2018). In their book, 'Changing Things,' they propose the idea of fluid assemblages to describe the emerging proto-category of things to which IoT gives rise. Fluid assemblages reside at the intersection of two dichotomies: production and consumption; design and use. For example, one might readily think of a smartphone as a fluid assemblage: although it is, through its construction and physicality, a stable material object—an assemblage—it is also fluid in that its material stability exists such that it can be upgraded, changed, reconfigured. In light of Sterling's reliance on, and near magnetic attraction to, one or another dichotomous end, the idea of approaching things

as extant in the liminal spaces between dichotomous categories is refreshing. Indeed, it is more than refreshing: it frames a potentially new class of things in an ontological light, as well as epistemological light (although the epistemological implications are just that: implicit).

Ultimately, however, there is still room to improve on Redström and Wilste's notion of fluid assemblages for the purposes of the present project. As much as they attempt to break down the dichotomies of production and consumption and design and use, they still rely on a much deeper, and much more philosophically troublesome dichotomy: that of the subject and object. If, as we shall see in the next section, things are a gathering, then we need to determine exactly *of what* they are a gathering. In terms of fluid assemblages, they are a gathering of components—object-like bits that combine to perform certain functions on behalf of the user. So, then, 'the user' is also included in this gathering. But for Redström and Wiltse, there is little overt consideration of just what that user is. In being enrolled into the concept of the fluid assemblage, are they enrolled into the ontological category of the object? Is this an assumption? The 'thingness' of the fluid assemblage ends at the boundaries of the object: it ends in the qualities of the object assembled *vis-à-vis* the intended, designed use of that object.

Ultimately, then, the concept of fluid assemblages runs into a problem similar to that which was in the earlier, definition-based literature review: the human user, the subject, is defined as a simple 'user' and thus preemptively reduced to the status of an object. She is defined almost exclusively in terms of her relationship to the designed object: in being defined in terms of this relationship, she is acted on (ontologically) as much as she acts on the object. If we are looking, in the context of the present project, for a means by which to analyze the potential discursive changes that 'the human' and 'the thing' will undergo, then it is necessary to develop a more human-

centered approach to the nature of the subject in relation to the object: one that goes beyond the simplified and constant operationalization of 'user.'

But the work of Redstr̈om and Wiltse provides a useful entrance to questions of the subject. If the object can be defined as a fluid assemblage, then so too, perhaps, can the subject. That is, if the 'thing' is a gathering, then it seems possible that the mechanisms of assemblage that affect the object also affect the subject that gathers with the object to construct the thing. As we will see in the next section, however, the it will be necessary to get a deeper understanding of the discourse of 'the thing' before we are able to move into an analysis of the role of the subject in constituting (and being co-constituted by) the thing.

2.4. Understanding Things

Things are at least complex as the phenomena of material culture to which they give rise—and that's putting it simply. As Malafouris and Renfrew noted, "things are good to think with or through, but not so good-to-think-about. The more time you spen[d] thinking about things the less of a thing and the more of an object or category they become" (2010, p. 1). They hit the nail on the head. But rather than fretting ever this conceptual-physical divide, I intend to lean into it. That is, in this section, I intend to examine the conceptual placeness of 'things'—their constituent parts and the assemblages or couplings that give rise to 'things.' Is there a useful way to approach 'things' as a category?

Arguably, the discursive difficulty surrounding things arises from the necessary distribution of the concept across actants in the historically dichotomous categories of 'subject' and 'object.' As Bill Brown puts it, 'the story of objects asserting themselves as things [„„] is the

story of a changed relation to the human subject and thus the story of how the thing really names less an object than a particular subject-object relation' (Brown, 2004, p. 4).

Brown is not alone the literary world.[59] Things are central to the construction of literary characters. This is not only true of 'literature,' but also of children's literature—those works that frequently serve as the youth's first introduction to the written world. As an example, take 'A House that Once Was' by Julie Fogliano and illustrated by Lane Smith (Fogliano & Smith, 2018). It's a charming little book about two small kids who wander into the woods and come upon an old house—an empty house. After a short stanza describing the emptiness of the house, the kids begin to wonder about the former tenants by way of the objects they left behind them:

> "Who was this someone
> who ate beans for dinner
> who sat by this fire
> who looked in this mirror?
> Who was this someone
> whose books have been waiting
> whose bed is still made
> whose pictures are fading?
>
> Who was this someone
> who walked down this hallway
> who cooked in this kitchen
> who napped in this chair?
> Who was this someone
> who left without packing
> someone who's gone
> but is still everywhere?"
>
> (Fogliano & Smith, 2018)

As Malafouris and Renfrew (2010) note, we learn from a very early age to see our world through the objects that surround us. The quote from Fogliano and Smith above cuts to the quick: "Who was this someone / who left without packing / someone who's gone / but is still

[59] I explore the role of things in the construction of certain characters in classic novels in the introduction to Part Two of this dissertation.

everywhere?" The absent tenants are everywhere in the shape of the objects they left behind. These are the objects through which and by means of which they lived their home life, their mundane moments of eating beans, walking from one room to the next, napping.[60]

And yet, the presence that lingers in the form of these objects, like the spectral memory of a life lived, is predominantly an absence. Each of the objects listed in the passages provided (as well as on the following pages of the children's picture book) are themselves half-empty. It is this emptiness, particularly in the context of a house that used to be a home, that interests me: the naive explorers central to this short text realize the emptiness of the home through the absence of the former tenants, but also (and more directly) through the unused objects that populate the space, the house. These objects, disused and abandoned, exist as spectral things: they remain as ghosts of themselves as they were when coupled with human subjects that acted through them, lived their daily lives by means of them.

Fogliano and Smith's juvenile explorers nudge the reader into imagining the type of people who lived in this space: if a picture is worth a thousand words, then objects must certainly be worth more. (Would that they fit onto a page!) It is as if to say that people can be reconstructed, at least in-part, through the objects that surround them.[61] These objects, in their potential thingness—their object qualities, which I will discuss shortly in a section on Heidegger and his jug—exist as a sort of passage point between one individual and the next. This passage point is to be found at the intersection of subjectivity, embodiment, and the environment: the kiddo-explorers share the requisite physical qualities (e.g., sensation and perception, etc.) to understand that there were other

[60] In his song, 'Rene and Georgette Magritte with their Dog After the War," Paul Simon also touches on the interpersonal, social function of things: "Side by side / They fell asleep / Decades gliding by like Indians / Time is cheap / When they wake up they will find / All of their personal belongings / Have intertwined."

[61] Here we approach the central tenets of several subfields of anthropology, not the least of which being cognitive anthropology.

people that existed in relation to the objects left behind. We can know much of a person—of their lives, their mundane moments—through the objects they leave behind precisely because we possess the analogous means of interacting with them. The objects with which we surround ourselves not only bound sets of potential actions, but they allude to the apparently idiosyncratic, but ultimately standard, material grammars that guide our daily lives. The set of objects present in this abandoned home constitute an infrastructure: but it is not the infrastructure of a city (as in the case of electricity, roads, sidewalks, plumbing). Rather, it is the infrastructure of a life, of quiet moments of apprehension or comfort, sleep or wakefulness, hunger or satiation.

A final note on this children's story: there is a magic, particularly when the reader attempts to read through child's eyes, in an object absent a subject. The magic occurs in the form of a pivot, where once an object was coupled with a subject now absent, it is now coupled with the subject that is present: a different subject. It is as a portal into another life—"another life I might have had, but I am having this one" in the words of Kazuo Ishiguro—another combinatorial interpretation of the same set of affordance-based actionable possibilities that we share as part of our human archive. In objects, we begin to see the basics of our being, of our relationships to the world, and indeed the construction of just what we mean by 'the world.' What's more, it is through the objects abandoned in an old house that the child protagonists of Fogliano and Smith's noted 2018 children's book that the reader—child and adult alike—comes to a tacit understanding that we live our lives—we engage in the act of being—*through* and *by means of* the objects that surround us.

A functionally similar interpretation of the term 'thing' can also be found at the core of the lines provided by Malafouris and Renfrew in the paragraph that opened this chapter. There they provide a subtle, but essential distinction for the arguments about 'things' that will follow. That an apparent difference exists between 'things' and 'objects' in whatever broader ontology they hold

hints at what I mean here. Their statement deserves some preliminary unpacking if we are to suitably understand the difference. Such unpacking begins at the act that separates the implicit definition of 'thing' from the implicit definition of 'object': 'thinking about' them. The prepositional adverb 'about' is (somewhat unexpectedly) the most important term in the dyad.

According to the authors, in the act of *thinking about* things, they are somehow transformed into objects or categories.[62] That is to say that such objects and categories are somehow different from the 'things' Malafouris and Renfrew have in mind. (For the moment, let us assume that these categories, in total, would comprise a certain taxonomy of objects—that is, the object comes first, the category second; interaction first, language second.) But what kind of transformation is this? Is it additive? Subtractive? Reductive or expansive? What can we deduce from the act of thinking *about* that might shed some light on this ontological transformation?

'About' occurs at some distance. What I mean by this is that 'about' removes the action of the thinker as it occurs in relation to the 'thing' from the ablative. One infers that for Malafouris and Renfrew in the act of thinking with or through a thing, the thinking agent is not entirely separable from the thing itself. To think with or through carries a certain hybrid materiality: the thinking agent, embodied and enacted, pairs with the object that is thought through or with. In this pairing off—this coupling—the thing is comprised as something more than just an object or a mere category. A brief consideration of the ablative case will illustrate.

What is directly involved when thinking 'about' a thing rather than thinking with it or through it? The body of the thinker. What is not directly involved? The thing itself. It is in this act of divorcing the body from the thing that the thing is reduced to the simpler state of 'object.' But

[62] Again we see similarities between the treatment of objects and the treatment of images in the work of Sartre (2004). The similarity occurs at the conceptual pivot of 'category' and 'image.' Both appear in the mind—in what Sartre referred to as the image consciousness—as a whole, absent of perspective. Because they are absent of perspective, they are disembodied doubly: subjectively disembodied and objectively disembodied.

even (especially) in this state of thought-based divorce, the physicality of the object and the subject comes into play. We do not think of objects and their use without an implicit understanding of how those objects might relate to our embodied states. We project our embodied states into a realm that is co-occupied by the thought of the object: the sum total of abstracted experience of and with the object in question, a sum total that renders an object *the* object. In short: we imagine interaction. The body—the human body—is never wholly absent from the notion of the object: it is an object creating system. Nevertheless, in the actionable world, the phenomenological world, a thing arises from the coupling of a subject and an object. It arises by means of interaction.

That thingness is bestowed on an object by means of a subject pairing or coupling with it in order to execute some kind of action—up to and including abstract thought—indicates that the 'thing' is not just one thing but (at least) a dyad of actants: the subject and the object. We would do well to keep this in mind not only as the present theory and empirical work unfolds, but as we design our way into a future that we describe with the term 'Internet of Things:' what does the 'thing' in the Internet of Things look like if those 'things' include objects that couple with other objects, or objects that couple with multiple subjects (both known and unknown)? Like rivers to the sea, do all objects eventually run to a subject?

This problem of things has received the detailed attention of scholars for many years—millennia. For reasons that will become clear over the course of this chapter and throughout the analysis that follows, I contend that the problem of *things* is perhaps *the* contemporary problem: we have emerged through the heritage of The Enlightenment into a pervasive mode of objectivism; a mode that subsumes subjectivist and predicative thought by the assumption that each of the triple ontologies can be described adequately through the lens of the objective. It is now the task to

question the validity of this approach not from the vantage of the scientific, but from the vantage of the ethical and the humanistic.

Much of the coverage that the thing receives is directly related to the fact that 'things' as a linguistic occurrence are indefinite—definitely indefinite. The signifier 'thing' has myriad referents belonging to myriad ontological categories, failing the (re)discovery of a basic state of thingness. In this way, 'thing' constitutes a named unnamedness, a lack of specificity.

To highlight the heterogeneity of such unnamedness, it is common in recent scholarly treatments of things to begin with a list. As Umberto Eco puts it, 'the list is the origin of culture,' and whether completely practical as in 'the shopping list, the will, the menu,' lists tie together objects leaving room for the subject, the creation of the thing, in the space between lines (Eco, 2009).

An exemplar list of things appears in what has been called an example of 'hipster phenomenology' (Peters, 2015a): Ian Bogost's 'Alien Phenomenology' (2012). Bogost begins his text with the following prosodic list: 'New Mexico offered me a childhood of weird objects,' including, but not limited to, 'mountains, fruit, atmospheric effects, nuclear warheads, sandwiches, automobile, historical events, relics" (Bogost, 2012, p. 1). Although there is a certain over-anxious wallflower quality to the prose (i.e., 'weird' appears as a badge of honor), it is nonetheless effective in creating for the reader the armature or impression of a habitus (Bourdieu, 1977). It is between the items in this list and the associated objects they imply that the childhood of the author—the triumphs and discoveries, embarrassments and failures, the familial relationships—took place. As such, this list of objects provides a context for Bogost's childhood as he remembers it and as it is introduced to his readers: the meaningfulness of experience resides in the space between.

I must admit, having been already involved in the production of lists, I was tempted to produce a list of my own here—presenting a list of the objects in my apartment, doubling as an office, would potentially shed light on the world as I know it, the relationships I form with objects to construct the things *through* and *by means of* which I live my life. Like the painstakingly bland description of urban minutia of George Perec's 'An Attempt to Exhaust a Place in Paris,' (Perec, 2010) a list of the things in my apartment alone would provide, in sum, a glance into my own little corner of the world, my habitus where cultural capital manifests in my *modus operandi* for being through things, my *lebenswelt* (Husserl, 1970).[63] But the things that concern me here are not necessarily things as phenomena—not yet, anyway—and it is not yet appropriate to delve into the phenomenological process of self-reflection through writing. Rather, the things that interest me presently are things as noumena, things as an ontological category unto themselves: things as a category without specific human subjects through which they might be encountered as phenomena, only necessarily implicit, but generic subjects.[64] Put differently, I am presently concerned with the image of the thing.

In order to give things their own place—that is, to see objects themselves as proto-things, rather than as concrete but subordinate actants as they might exist in relation to me or you—it is beneficial to consider some less personal lists. The phenomenologist Max Van Manen (2014) provides the following, somewhat comical list to illustrate that is it 'specifically in the unnamedness where the enigma, strangeness, and otherness of the thingness of the thing resides':[65]

[63] It is my position that there is a great deal more to gain from the overlapping use of these terms (*habitus*, *lebenswelt*, *umwelt*) than their segregation and dissection. Each approaches the realm of the experiential human world from their own disciplinary vantage.

[64] As Manual DeLanda notes in an analysis of Deleuze, "it is traditional since Kant to distinguish between the world as it appears to us humans, the world of phenomena or appearances, and those aspects of the world existing by themselves and referred to as 'noumena'" (DeLanda, 1998). Although this dichotomy of phenomena and noumena relies on an underlying notion of a single and stable world—an ontological ground truth that is unchanging—which is somewhat too reductionist for my tastes, I find it useful for communicative purposes.

[65] It is worth noting that much of the language employed in investigations of 'things' appears as vaguely comical.

object (organic and inorganic things)
material (concrete things)
task (things to do)
deed (the thing that is done)
idea (thing to think about)
event (the thing that happened to me)
hyperobjects (massive ecological things like climate)
theme or topic (this thing called love)
belongings (where are my things?)
equipment (the things in my toolbox)
preoccupation (I have too many things on my mind)
incident (strange things happen)
affairs (how are things with you?)
characteristic (things I like about you)
facts (things you should know)
stuff (the room is full of things)
field vibrations (supposed ultimate cosmic things of deep matter)
matter (the substance of the thing)
antimatter (is things composed of antiparticles)
quality (she is such an endearing little thing)
dislike (I have this thing about noisy people)
penchant (she has a thing for sexy men)
concern (it is not my sort of thing)
what matters (let's get back to the things themselves)
no name (where is your thingamajig?)

(Manen, 2014, pp. 50–51)

As Van Manen notes, this list is not particularly functional: it is plain to see that certain items in this list could be grouped together in order to generate a more stable, hierarchical taxonomy. (For example, 'facts' and 'deeds' appear entirely too closely related to be treated as mutually exclusive for at least the reason of etymology [*faire*, *fait*]. Each of the things comprising this list, too, implies a human actant.) Still, the list is rhetorically sufficient for demonstrating the heterogeneity of things and illustrating, albeit in a hyperbolic way, the root of scholarly interest in things: they are many and they are everywhere.

Even the seriousness of Heidegger is not impervious to a few readerly giggles stemming from, I think, a Freudian nervous energy born of discomfort with the shortcomings and absurdity of language: "But from the objectness of the object, and from the product's self-support, there is no way that leads to the thingness of the thing. What in the thing is thingly?" (Heidegger, 1971, p.165).

This nearly standard laundry list approach to things—as if written by the old man in Sherwood Anderson's *Paper Pills* (2013) so as to 'confound!'—*things* appear as an unending, schizophrenic children's game of categories and classification: 'which one of these things does not belong?' It is as if the *thing* resides as a proto-ontological level, an awareness of a possible coming-to-being, but one that necessarily evades or precedes any sort of prototypal classification (Rosch, 1978).

Unlike Bogost, but perhaps less dissimilar to the goals of Van Manen, I do not intend to argue for a flat ontology that requires a full toppling of subjectivity, nor do I seek a deeply personal elucidation of the objects populating my world. Rather, in this investigation of things I aim to highlight the humanistic importance of subjectivity—the variance and brilliance of coupling, however fleeting or durable, between the human subject and the object that constructs the world before us. Moreover, to question the nature of things as the constellation of subjects and objects that comprise them evolves. This might be taken as a sort of flattening: to see all things as subject-object relationships is, indeed, a type of flattening. But it ultimately cannot be a reductive flattening because the subject (i.e., the human being) is always already present in this relationship. As we know (and for which Herbert Simon won a Nobel Prize), humans are irrational actors. Such irrationality constitutes a fundamentally irreducible quality: there is always noise in the communication, a glitch in the circuit. But this is getting ahead of myself. Back to the things themselves (as it is said), or the *concept of things*, anyway.

As described by IoT scholars based on their readings of Aristotle and John the Grammarian, "In the context of 'Internet of Things' a 'thing' could be defined as a real/physical or digital/virtual entity that exists and moves in space and time and is capable of being identified. Things are commonly identified by assigned identification numbers, names and/or location addresses"

(Sundmaeker, et al., 2010, p. 43). This act of identification brings us back to the core heterogeneity of actants that characterizes the 'thing:' the act of identification requires not only an object that is identified, but also some kind of agential actant responsible for the act of identification. It would seem, according to the definition provided by Sundmaeker et al (2010), that a 'thing' in IoT may well be constituted by a hierarchical coupling between two objects: an object imbued with sensors and a more nuanced or sophisticated computational device (or network of devices) that is responsible for the identification of that object and the collection of the data it gathers via its sensors. One might say that from this theoretical vantage—and taking full advantage of the hipster vernacular—things are getting weird. The idea that all objects or networks of objects must at some point intersect with the actionable human archive—must intersect with the characteristics of the embodied human—however, brings us around to a more traditional phenomenological approach: to account for the appearance of the thing.

2.4.1 Things in Phenomenology

The coverage of *things* in the philosophical literature deserves attention, particularly in relation to phenomenology, and more broadly, to theories of perception developed after (and often in contrast to) Kant (B. Olsen, 2010). In such theories arise fundamental issues regarding the subject/object dichotomy, extending back to (at least) the problematic declaration of Descartes: *cogito ergo sum*.[66] In placing primacy on the act of thinking, and thus relegating the body and bodily experience to a secondary ontological and epistemological category, Descartes concretized the place of the thinking subject as superior to the unthinking object. The subject thinks; the object

[66] How might the production of knowledge differ in a world where Descartes pronounced, 'I am therefore I think'?

is thought of or upon. Thus, thought was elevated over action; the role of the object in the act of thinking, tacitized. As Simon Penny (2017) put it: "In modern Western culture, rational and conscious reasoning—expressed in the abstractions of symbol, number, text, and spoken language—have been privileged over human practices that are social, embodied, and materially instantiated' (p. 253). The body and its physicality (as subservient to the mind and its symbols) can be seen as representative of a lesser class of ontological entities: namely, physical objects. In a Cartesian framework, the mind controls the body: the thinking subject reigns supreme (even when that subject is paradoxically objectified through the ever-specifying understanding of neuro-anatomy and physiology).

Whereas 'Cartesian thinking left us with a notion of matter as passive and inert, while the human mind was seen as active and creative,' contemporary approaches to things are derived from post-Cartesian theories of being (Olsen, 2010, p. 65). To begin to trace the evolution of things in a suitable way, although not to the fullest extent possible, we move immediately from Descartes to Emmanuel Kant.

The 'thing' in Kantian philosophy is an issue of appearances, unreachable but for the processes of human perception that give rise to them. The object must first pass through a field of perception in order to acquaint itself with the subject—but this acquaintance is never a direct one. (This problem is still played out in the form of the direct- and indirect-perception arguments that plague contemporary cognitive science.) The object in the world, outside the body, but more importantly ontologically separate from the mind, is always already mediated by the filters of perception when it is encountered.[67] This aspect of the nature of the subject in relation to the world-

[67] In much of the philosophical work conducted during and after the long 18th century, one sees the beginnings of a contemporarily vicious debate: between proponents of direct and indirect theories of perception. (See Smythies & French, 2018.)

as-set-of-objects gives rise to the dichotomous and complementary categories of phenomena and noumena. Whereas phenomena refer, literally, to 'that which appears', and therefore to the world as it is filtered through the subjectivity of human sensation and perception, noumena refer to objects in the world unfiltered by such sensation and perception.[68]

To this perceptually grounded notion of objects in the world Edmund Husserl added the concept of intentionality, derived as it was from the work of Husserl's mentor, Brentano—where the thinking subject perceives of objects in the world as *of* or *for* some purpose. That is, as Paul Dourish explains, Husserl's phenomenology concerns itself, early on, with investigating the relationship between mental states and external reality: "Intentionality describes the relationship between the tree outside my window and my thinking about it" (Dourish, 2004, p. 105). But it does slightly more than that: it contextualizes the tree outside the writer's window in terms of functionality, memory, experience. Paul sitting at his desk is never *just* Paul sitting at his desk: he is Paul in space and time, with a past and a future. In other words, he is irreducible to Paul-in-a-Vacuum. Things, in this context, appear to belong exclusively to the category of phenomena in that they can only be experienced when filtered through the lens of the body: to think of things outside of the body—untouched by the embodiment of the human—is to think of objects, to reduce interaction to functional requirements.

Husserl's intentionality acquired on a new set of resonances through the writings of both Heidegger and Merleau-Ponty, characterized by what Merleau-Ponty referred to as a 'return to the phenomenal' (Merleau-Ponty, 2002, p. 67): In returning to the phenomenal, the author came to

[68] Here I tend to agree with Kant: noumena can be deduced logically, but they cannot be experienced. Even the process of logical deduction relies on some sort of subjectivity, some system capable of logical deduction, which must always already involve some kind of embodiment…

focus more intensely on the importance of the mundane, of the experience in the everyday world and the invisible mediation of perception that characterizes it:

> Our task will be, moreover, to rediscover phenomena, the layer of living experience through which other people and things are first given to us, the system 'Self-others-things' as it comes into being; to reawaken perception and foil its trick of allowing us to forget it as a fact and as perception in the interest of the object which it presents to us and of the rational tradition to which it gives rise. (Merleau-Ponty, 2002, p. 66)

It is from this focus on intentionality in everyday experience that the Heidegerrian concept of *Dasein* arguably emerges. That is, the shift in focus to highlight the nature of phenomena at the level of the mundane, always already perceived by a human agent, necessitated a further shift in critical gaze, wherein the paucity of the human-environment dichotomy was alleviated by the permanent coupling of being-in-the-world.

2.4.2 Heidegger's Things[69]

The first place to look when consulting Heidegger regarding the nature of things is his essay 'What is a Thing'? (Heidegger, 1968). But first appearances can be deceiving. Instead, and prior to the lengthy analysis and critique that 'What is a Thing?' deserves, I introduce some precursor Heideggerian concepts.

Against the backdrop, not only theoretical but experiential (existential), of being-in-the-world, Heidegger broke from what has come to be seen as the first school of phenomenology. In doing so, he sought to emphasize the previously de-emphasized category of being in the traditional,

[69] It is a necessary evil to work through what I'll refer to as the 'thing theory' of Heidegger. Necessary because of his prodigious mental ability and output regarding the topic; evil because of his affiliation with a murderous fascist regime. So, it is with some reluctance that I, at a point in time when totalitarianism is again on the rise, engage with the work of a Nazi sympathizer—and with further reluctance that I demonstrate an affinity for much of his work.

Cartesian dichotomy of knowing and being.[70] This shift towards what is now referred to a hermeneutic phenomenology gave rise to the oft-cited notions of 'ready-to-hand' and 'present-at-hand.' The difference is subtle, but integral to developing any notion of *things* as it has directly to do with the nature of the relationship between a subject and an object—that is, in the construction of a thing.

For the purposes of illustration, one might say that objects in the world begin as present-at-hand and shift into the category of ready-to-hand. The object in the world is present-at-hand when it is the object of conscious, concerted mental effort. (It is possible, then, to see a link between Heidegger and Susan Leigh Star's work on infrastructure—if infrastructure is only visible when it is broken, then we might say that infrastructure is only visible when it is present-at-hand rather than functioning readily. To be ready-to-hand is to be invisible.) On the other hand, the object is ready-to-hand when no such intentional, conscious consideration of the object is necessary for its use. That is, intentionality pervades both conditions of ready-to- and present-at-hand, but it is the conscious awareness, the presence of exerted conscious effort when attempting to use an object, that relegates it to the category of present-at-hand. Paul Dourish, again, illustrates:

> Much of the time, I act *through* the mouse; the mouse is an extension of my hand as I select objects, operate menus, and so forth. The mouse is, in Heidegger's terms, ready-to-hand. Sometimes, however, such as when I reach for the edge of the mousepad and cannot move the mouse further, my orientation toward the mouse changes. Now, I become conscious of the mouse mediating my action, precisely because of the fact that it has been interrupted. The mouse becomes the object of my attention as I pick it up and move it back to the center of the mousepad. When I act in this way, being mindful of it *as* an object of my activity, the mouse is *present-at-hand*. (Dourish, 2004, p. 109)

[70] Contra Heidegger, I see no reason to separate being from knowing: being is knowing.

Despite the flow from ready- to present- in the example above, the mouse, being an invention belonging clearly to the realm of the artificial (Simon, 1996), necessarily begins its whatness, its existence, as present-at-hand. That is, its invention at Xerox-PARC in the 1980s can (simplistically) be seen as a reaction to an identified absence: namely, an absence in desired usability for interacting with the then-nascent graphical user interface (GUI). It becomes capable of belonging to the category of ready- only upon its widespread adoption, its naturalization as a component of an increasingly computerized world. Following such naturalization, it inhabits the category of ready-to-hand by means of its accepted functionality: it is the way in which most non-linguistic interactions take place with a computer. It is only at the point of failure (either objective as in a faulty clicker or subjective as in an arthritic hand) that the mouse recedes back into the category of present-at-hand.

This transition from present- to ready- deserves as much attention as I have just given it for the following reason: it predicates another condition described by Heidegger, which is of great theoretical value for analyzing the problem of things in contemporary society. This condition is that of 'standing reserve':

> Everywhere everything is ordered to stand by, to be immediately at hand, indeed to stand there just so that it may be on call for a further ordering. Whatever is ordered about in this way has its own standing. We call it the standing-reserve [*Bestand*]. The word expresses here something more, and something more essential, than mere 'stock.' (Heidegger, 1977, p. 17)

Heidegger goes on, in his own inimitably frustrating prose, to beguile the reader into a vague notion of standing-reserve. I believe, however, it can be summed up clearly enough with reference to the old maxim about the hammer and the nail: when you hold a hammer, the world becomes only nails. That is, as the state of an object as ready-to-hand becomes naturalized—when

the category of ready-to-hand pervades human interaction with any set of objects—the expectation of such a state pervades, too. The objects in the world, necessarily intentional and phenomenal, become a category of potentially ready-to-hand. They become proto-things ripe for coupling with a subjective actor: they become subject to the expectation of standing reserve. But with all this said, little has actually been clarified about the notion of a 'thing.' So, it is an appropriate point to embark on a detailed reading, analysis and critique of the essay, 'The Thing.' In a material culture, objects are standing reserve for the thinging.

Heidegger is notoriously difficult to read. Those who specialize in Heidegger—the system of thought that he so opaquely put forth in his writings without any of the intentionally humorous opacity found in, say, Derrida—are often criticized for simply rehashing what was originally written, albeit in clearer, if inaccurate language (Biemel & Emad, 1980). So, I will try to avoid this sort of rehashing as much as I will wholly avoid calling myself Heideggerian. It just so happens that one must pass through the work of Heidegger if one is to address the notion of 'the thing' in any full sense given its placement in the scholarly canon. (To fail to do so would be like attempting to write a history of Western music without mention of The Beatles—or perhaps Wagner would be a better example?)

In addressing 'the thing' and 'The Thing' as both concept and essay, I will limit my writing to the analysis of a few small fragments. I will focus on the following lines:

> (A) "Science's knowledge, which is compelling within its own sphere, the sphere of objects, already had annihilated things as things long before the atom bomb exploded" (Heidegger, 1971, p. 170).
>
> (B) "The jug's jug-character is present in the poured gift of the pouring out" (Heidegger, 1971, p. 170).

I focus on these lines rather than presenting a play-by-play analysis of the essay and concept because one can, in these few lines, find the full point that Heidegger was trying to make: the thing (in this case the jug) becomes a thing, or perhaps always already *is* a thing, in relation to the experience of *being* in all of its Dasein-y richness, rather than in relation to systematic scientific inquiry. The object is observed; the thing is live with, by means of, and through.

In relation to Quote A: science is something of a boogieman for the thing. That is, science—and we must think that Heidegger was referencing those forms of 'science' that arose after The Enlightenment, such as objectivism—produces knowledge only in relation to the questions it knows how to ask. Without a scientific approach there could be no scientific understanding of Heidegger's jug—however absurd that understanding would be, anyway—but simply because one might arrive at a scientific understanding of a jug does not mean that such an understanding actually gets at the thingness of the jug. Such a definition would only be a definition of the jug in terms of the science used to measure it. (One thinks of external validity here not in terms of the world outside of a laboratory, but rather a world outside of a particular mode of knowledge production, a particular epistemology.)

In claiming that science has already annihilated the thing long before the atom bomb, Heidegger is arguing that there is a reductive tendency within objectivism. But 'tendency' is not quite strong enough: if I might liken objectivism to Freudian thinking, then reduction becomes a drive not unlike the libido or death drive. Reductionism is inherent to objectivism, an epistemology which is predicated on the removal of ***x*** from the world so as to make it known as ***x***, so as to know ***x***. If the jug is ***x*** and the jug is also a thing (***y***), then we can know very little of ***y*** through the observation of ***x*** because that which is observed and analyzed in terms of science is always already reduced—it is always already created as something other than itself, something that can be

observed: an object rather than a thing. So, what mode of knowledge production can be employed to know about the jug-as-thing if not science? This question brings us to Quote B.

I focus on Quote B not only because it is funny—and I find that it is requisite to approach such self-involved serious writing with an ample sense of humor—but because of the focus on an action: pouring. Why is his focus on an action so important? Because an action implies both a subject and an object: a subject acts upon an object; an object is acted upon.[71] The jug is a thing beyond any scientific definition of itself precisely because it exists in relation to a subject that will use it, and subjectivity is the antithesis of the form of objectivity constructed through the execution of the scientific method: within the act of pouring is assumed the role of holding. The jug holds water so as to be poured. But poured by whom? And for what purpose? (Can there be a purpose without a 'whom'? Surely not. It would not be called a 'purpose' or indeed be called anything. It would be as silent as the tree falling in the forest falling upon a dearth of ears.)

The jug is a thing in its purest sense when it is coupled with the experience of being, which from time to time includes the need to contain a liquid, to pour a liquid. In the space of interaction between the jug (an object, be it a representation in the mind, a drawing, etc., or an unused bit of mass taking up space in a room) and the pourer or filler of the jug, the jug in question becomes a thing. Thingness is bestowed only ever in relation to the experience of being, where (for the present argument, if not for the whole of Hedeggerian thought) being is achieved by the state of humanness complete with Dasein, thrownness, and all the other linguistic goodies with which Herr Professor Doktor Heidegger left us. To be a thing and to be perceived of as a thing are one in the same: the

[71] Here the difference between active and passive voice is important: it alludes to the very nature of the object as something that is passive, acted upon in any situation imaginable by some entity filling the category-role of 'subject.' The passive voice is the embodiment of the object; the filling in of the passive voice's hidden subject is the creation of the thing. As I will argue later, the ability of an object to act emerges from IoT, which creates some truly odd ontological effects.

act of perception when coupled with agentic action, grounded in the act of being human, is to produce a thing; the thing cannot exist in the absence of the human that is being and being actively. Its existence as a thing is predicated on its relationship to a subject.

Once again, it is worth returning to Quote A: the thing cannot exist in purely scientific terms because the goal of science—and let's think here of experimental controls—is to remove the subject from that which is being observed. To remove the subject is to abort the 'thing.' Where does this leave us in terms of the Internet of Things?

Well, it leaves us here: to study the Internet of Things, or rather to study the nature of the 'thing' in the Internet of Things (and therefore to study the subject-object couple that constitutes a thing in IoT) is to study the experience of being in relation to IoT-enabled devices. But more than that, it is to study just what subjects and objects are active in the construction of a given 'thing' in IoT—we are well beyond the simple dyadic subject-object relationship that constitutes the jug-as-thing.

The scientific study of the thing—and there I roughly equate science with engineering, science with technology—certainly has its merits. As Heidegger wrote, '[science's knowledge] is compelling within its own sphere' (Heidegger, 1971, p. 170). The scientific study of the thing can tell us much about the object that underlies, or resides in proximity to the dissected and dead 'thing,' but it cannot tell us much at all about the experience of being in relation to the 'thing' in 'Internet of Things.' Science objectifies; the object is only one aspect, one facet of the 'thing;' humans know their world through the nearness of the 'thing'; therefore, to rely on a scientific understanding of 'the thing' that can never regenerate its thingness that has been amputated by its subjection to science is to rely on only a partial understanding of the thing. To rely on such a partial understanding would be akin to going to an oncologist and being told you are completely and

forever cancer-free based on the biopsy of one randomly selected tissue on your body. That is to say, it would be silly (if such things as cancer can be seen a silly).

So, and finally, I can write something that I've wanted to write for a while: the methodologies employed in this dissertation are emphatically not scientific! I will make many observations, provide many interpretations but I will not claim to do so scientifically where 'science' is equated with 'reductionist objectivism.' To do so scientifically would be woefully misguided: it would be to study things as objects, and it is not the Internet of Objects, but the Internet of Things. It exists (and will exist in some realized future form) alongside us, as part of the human experience of being. If one of the foci of this work is to understand how and into what the discourse of 'the human' will transform—and this question of the human fundamentally tied to the question of 'the thing'—then no progress can be made other than topical by means of objectifying either the human or the 'thing,' unless we are simply to assume that the human will reach their ontological apotheosis as an object.[72] They must be taken as a whole; they must be considered in terms of being: in terms of the mundane act of knowledge production effected through embodied action in the world, interaction between subject and object, that is synonymous with 'being'.

In addition to the phenomenological approaches to things described above, although not entirely dissimilar to them, the notion of *things* has received important coverage in the field of media theory. For Marshall McLuhan the medium was not only the message but also the *massage* (McLuhan et al., 1996). In being the message, he meant that a given medium becomes a medium when it carries another one along with it, inside of it, as a result of it. In carrying another medium inside of it or as a result of it, the medium in question bounds what we can and cannot say: it

[72] This is, indeed, one of the central findings of this dissertation: the human is becoming their own object. But it is a finding predicated on tested methodologies, not on the form of assumption that is implied in this statement.

shapes, in however tacit or naturalized a way, the boundaries of our perceptual and communicative relationships with the world around us (including other people and other machines, other media). This is at the heart of what is called medium theory. But, to me, this is more interestingly stated through the metaphor of massage: "the medium is the massage and media work us over completely."

I find this statement fascinating because it is somewhat at odds with much of McLuhan's work, but it resonates exceedingly well with my own desire to include the human body as a media format—again, our embodiment is the root of the human archive; therefore, our embodiment constitutes a form of media that both contains and is contained by the archive. McLuhan is known for passionately excluding the human body from his discussions of media. But to rely on the metaphor of 'massage' is to place the body in the foreground. The media that surround us work of over: they are the masseuse. In being the masseuse, they shape the very experience of embodiment. Media are inextricable from the experience of being. To return again to a thought borrowed from John Dunham Peters, media are ablative. We live through them and by means of them. They are the masseuse that keeps us limber or contorted, cramped and stitched, or willowy as a Russian ballerina.

Although the thing—as a broad, ontological category—is of implicit importance in the work of McLuhan, it is most clearly addressed in the work of another media theorist: Vilém Flusser. For Flusser, 'things teach us about the world we live in and the *modus operendi* of our living in it' (Alpanscar, 2015, p. 408).[73] There are, however, multiple ways in which Alpanscar's treatment of

[73] For an example of Flusser writing on this topic, I recommend 'Does Writing Have a Future?' (2011a) and 'Into the Universe of Technical Images' (2011b). In the former, Flusser considers the role of writing—the material instantiation of inscription—on the experience of thinking, therefore communicating, therefore being; in the latter, he questions and troubles the role of what he refers to as the technical image—or a representation of the world that is not tied to a natural world, but rather filtered through the layers of infrastructural artifice so as to reflect upon and further reshape the *naturalized* world.

Flusserian thought can be interpreted. Perhaps unsurprisingly, given my evidenced tendency to focus on the often-overlooked parts of speech, these interpretations stem from the terms 'about' and 'in.' These interpretations necessitate a smallish detour into defining 'knowledge.'

So, at this point, we can roughly claim that things are comprised of subjects and objects. That is, 'things' arise from the affordances that present themselves in the relationship between a given subject and a given object. In this way, the 'thing' becomes something that, as per Gibson, troubles the subject-object dichotomy. It resides between the two, emerges from them: it is neither subjective nor objective, but possible predicative. It is in the act of co-constituting 'things' that we both produce knowledge and render that knowledge durable by creating objects that will couple with subjects further down the temporal road.

With this literature review of 'thing's and the history of IoT behind us, it becomes germane to put some of what we've seen to action. Before getting to the empirical sections of this work, it is first necessary to see if what I've said about 'things'—their dyadic nature—can be used to interpret the Internet of Things. To do that, I turn our attention to a close reading of a canonical piece of IoT literature: "That 'Internet of Things' Thing" by Kevin Ashton (2009).

2.5 On Kevin Ashton's 'Internet of Things' Thing

Kevin Ashton's (2009) article, "That 'Internet of Things' Thing," is a paper fundamentally concerned with concretizing a nascent concept even as it evolves across time—a linguistic signifier as it relates to an evolving referent. (Echoes of the question, "What is the Internet of Things?" reverberate.) More than that, it is an endeavor in corrective concretization. ("*This* is what it is, not *that*!") Such retrospection builds toward a reframing or refocusing of the term and its use within

the RFID community writ large. However, the reach of the article extends far beyond the RFID community: it is a nearly omnipresent citation in the IoT literature. It is the author's goal here to read Ashton's concept of IoT—to examine its ontological and epistemological assumptions by way of close reading—in order to answer a core question: How is it that the Internet of Things, an optimistic and rich category of objects that promises to impact fundamental, mundane aspects of daily life, has come to be treated as a purely technical topic in much of the scholarly literature concerned with it? In order to do so, primary attention will be given to the linguistic discourses that underlie the construction of Ashton's 'Internet of Things.' In doing so, this section of Chapter Two comprises incremental progress towards providing IoT with a richer theoretical grounding—a need that has been previously identified in this fields of communication and media studies (Bunz, 2016). Such progress opens the door to further media- and infrastructure-centered, philosophical and phenomenological, and critical theoretic inquiries into the Internet of Things. I argue that without scholarship stemming from these traditions, IoT risks concretizing as a predominantly technical category of objects, ignoring at the users' peril social and cultural implications of a necessarily sociotechnical system.

Analysis of this article comes with certain methodological pitfalls. Most obviously, this article lacks historicity. That is, it is a recollection of an event for which no primary sources are available and would not pass muster in even Ranke's history seminars (cf Grafton, 1997). So, then, the data preclude analysis of the actual event the paper describes; instead, and by way of the article in question, it is only possible to analyze the conceptual space that the data creates.

Although it seems reasonable to take Ashton at his word—and thereby choose to rely on his recollection of coining the term 'Internet of Things'—we can do *only* that. We can rely only on the

textual representation, written some ten years after the event it concerns by an author who, in those ten years, gained considerable professional traction as a result of his work at the Auto-ID lab at MIT, which focuses largely on RFID. In so relying on the 2009 document, we must set aside the inclination to seek insight into the text from the life of its author, and instead simply read the text. Ultimately this will have to do: primary materials from the referenced meeting at Proctor & Gamble (P&G) such as slide ware, a list of attendees, attendees' notes, a video recording, or transcript are inaccessible. Even if they reside in the archives of P&G—an unlikely scenario given my experiences trying to gain access to archival material from large corporations such as Intel and General Electric—they do not play a role in the written, scholarly discourse on IoT. The event has been blackboxed by the passage of time and the 2009 redefinition of the event. In being blackboxed, it has taken on near mythical characteristics, increasingly bolstered by the number of direct and indirect citations it receives. (In certain circles, one might expect to hear a reference to this talk along the same lines that a songwriter expects to encounter the mythologized tale of McCartney's dream-state composition of 'Yesterday.') So, in relying on the textual representation presented in 2009—taking Ashton at his word—we are emphatically not analyzing an event from 1999, but a post-dated inscription of that event. This analysis is about the 2009 document as it appears in the IoT literature. No more, no less.

As of January 28, 2019, Ashton's 2009 paper, "That 'Internet of Things' Thing' has received 2,853 citations according to Google Scholar. Its reach, however, goes far beyond that number: major works authored by governmental institutions, researchers at university, and researchers in industry also cite its contents as foundational to IoT. Many of these works are cited upwards to 2000 times. For example, the second most cited article about IoT,' 'Internet of Things: Visions, Applications and Challenges,' by Gubbi, et al., (2013) has been cited at 5,901 times as of January

28, 2019.[74] Ashton's 2009 article is as an *eminence grise* in the IoT literature—if not directly present, then exerting influence through proxy. The short piece in question was published in RFID Journal and consists of a recollection and reiteration of Ashton's meaning of the term 'Internet of Things'—hence its suitability for analysis here.

Although it was published nine years ago, the topical focus of Ashton's paper is an event that occurred nineteen years ago at what Ashton remembers as the birth of the term—a birth for which he is responsible. As Ashton writes, "I could be wrong, but I'm fairly sure the phrase 'Internet of Things' began its life as the title of a presentation I made at P&G in 1999." He goes on to write that the goal of the presentation at P&G was not only to get executive attention, but to link the RFID technology used in P&G's supply chain to the 'then-red-hot topic of the Internet.' Beneath the topical focus—an event in 1999—primary focus is given to the evolution of the term between 1999 and the authoring of the paper in 2009.

The most interesting aspects of Ashton's paper are those that are somewhat obscured by the text itself. These are the ideas that (1) there was ever a 'there' to IoT and (2) that a peculiar taxonomy of 'things' subtends that conceptual placeness—the 'there' that ostensibly resides at the core of IoT. Although these two aspects are directly related to one another, it is beneficial to address them separately prior to attempting to grok their relationship. (The benefits of such an approach will become clear as the argument progresses, suffice for now to say that each of these aspects has a few facets.)

In opening the article with a statement about the origins of the term 'Internet of Things,' Ashton is both claiming ownership and opening the door to a linguistic discourse analysis of the term. The paper is about the term 'Internet of Things' and is framed by the extent to which the term is 'often misunderstood.' The claim

[74] The most cited article in the IoT canon is Atzori, et al.'s (2010) 'Internet of Things: A Survey,' which has been cited 9,749 times per Google Scholar as of January 28, 2019.

towards an absent authority to right the definitional ship (e.g., "The fact that I was the first person to say 'Internet of Things' doesn't give me any right to control how others use the phrase.") or to exert control over the ways in which IoT has come to be defined since its coinage in 1999, is a transparent one. Just prior to presenting a corrective definition, the author writes, '[…] what I meant and still mean, is this[…].' Given the author's prominence in the field, as well as his central role in developing the technologies that rendered the proximal future(s) of IoT possible, it is only reasonable to read his redefinition of 'Internet of Things' as a corrective measure. It is meant to reframe IoT in a *certain way*.

Ashton's (2009) redefinition appears in the article's second paragraph:

> Today computers—and, therefore, the Internet—are almost wholly dependent on human beings for information. Nearly all of the roughly 50 petabytes […] of data available on the Internet was first captured and created by human beings—by typing, pressing a record button, taking a digital picture or scanning a bar code. Conventional diagrams of the Internet include servers and routers and so on, but they leave out the most numerous and important routers of all: people. The problem is, people have limited time, attention and accuracy—all of which means they are not very good at capturing data about the real world.

Here, the author constructs a dichotomy on which he will rely implicitly for the remainder of the article. For Ashton, IoT can be divided into two opposing categories of actants: humans and computers ('and, therefore, the Internet').[4] These are the subjects and objects at the core of the IoT story. This dichotomy of humans and computers, however, is characterized by an uneven distribution of power: computers, in their reliance on human-entered data, are less empowered. But, as Ashton argues, the paucity of human attention, accuracy and available time, all function to limit the usefulness of human-entered data. There appears to be a 'real world' out there beyond the scope of human-entered data; a real world that humans are ill-equipped to record despite living in it and co-constituting it. (This raises interesting questions about another issue surrounding the notion of affordances: the ongoing debate between direct and indirect theories of perception.

However, this facet of affordances is beyond the scope of this paper.) The backdrop for Ashton's redefinition of IoT begins to appear: computers occupy a subservient ontological position because of their reliance on unreliable and possibly invalid human-entered data.

Ashton goes on to write that, "[…] that's a big deal. We're physical and so is our environment. Our economy, society and survival aren't based on ideas or information—they're based on things. […] Ideas and information are important, but things matter much more." A close reading of this statement reveals some cracks in the foundation of Ashton's human/computer dialectic. The cracks appear at the first mention of 'things.'

The separation of 'ideas [and] information' from 'things' is hasty. Scholars in fields as disparate as media studies, ecological psychology, informatics, and anthropology have argued that the physicality of a thing carries information. For Lisa Gitelman (2014), the structure and physical qualities of an institutional document directly influence the type of semantic content that can be included in that document, and therefore the ontological and organizational assumptions on which an institution functions. Dourish (2004) argues that the phenomenological world—that most irreducible of experiential worlds—in part, unfolds through subject-object interactions in the form of users and computers. Tim Ingold (2006) provides a persuasive argument for the knowledge of physical actions that is arises between a craftsman, a saw, and a piece of lumber. Surely the characteristics of objects in and of the environment constitute information when paired with a sensing, perceiving subject. If, returning to Descartes, it is thinking that makes us exist, and thinking arises from sensory and perceptual input, then the *objects or 'things' in the world* that are translated through sensation and perception into the *objects of thought c*onstitute informational objects. Things, in short, are always already informational from a human point of view. Ashton's separation of 'ideas and information' from 'things' just doesn't hold water.

Second, aren't computers things, too? They occupy space in the world and have mass; they possess characteristics that present to subjects possessed of actionable capabilities. A computer also 'knows' things about itself; things the user does not (e.g., how many packets it's received and sent in the past *t* amount of time.) The computer possibly comprises both the subject qualities and the object qualities that give rise to the 'thing' via their coupling. However, for Ashton, computers exist as diametrically opposed to humans: they represent the objects to the subjects of human users. This seemingly small hiccup in the subject-object dichotomy is highly problematic and deserves further scrutiny. Such scrutiny will tell us much about the objects that co-constitute 'things' in IoT.

The definition of IoT provided by Ashton parses only when the primacy of the human subject is abandoned. In the absence of a human-subject primacy—and assuming that the author's intent is to stay with the bipartite ontology he introduced through the dichotomy of 'humans and computers'—something else must take its place. Attentive reading demonstrates that Ashton isn't constructing his redefinition of IoT from a human point of view:

> […] today's information technology is so dependent on data originated by people that our computers know much more about ideas than things. / If we had computers that knew everything there was to know about things—using data they gathered without any help from us—we would be able to track and count everything, and greatly reduce waste, loss and cost.

That computers know more about ideas than things is a result of translation. Information filtered from environment to human to computer is necessarily going to be colored by the very filters that render it human-readable, so to speak. The supposition, 'If we had,' that begins the next paragraph reads as a wish. The remainder of the statement deserves reading in this context. In light of this wishful framing, information splits into two categories: human information and computer information. If it is the standard kit of human sensation

and perception that gives rise to human-received information about things in the world, then the reciprocal would be true for computers: to create a computer 'that knew everything there was to know about things,' it would need its own kit. Ashton is implicitly discussing both an ontological shift and an epistemological shift: he is constructing a proximal future of IoT in which computers have access to a form of information that circumvents human intervention, thus giving rise to a parallel ontology of objects in the world, but also a parallel epistemology—one that is phenomenologically inaccessible to humans (precisely the logic of machine learning in data science). The computer, here, assumes both roles of subject and object. It is a chimerical object.

Ashton points to such a computer-centered information ecology in his next paragraph: "We need to empower computers with their own means of gathering information, so they can see, hear and smell the world for themselves, in all its random glory." The transference of animal senses to computers by means of prosthetic sensors further suggests that Ashton does not consider computers to be objects, *per se*, but rather to be chimeric object-subjectivities potentially possessed of their own ontology, their own categories of objects with which they might perceptually couple separate from and irreducible to the class of objects found in human subjectivity.

In Ashton's particular imaginary of IoT, IoT arises as a parallel and separate perceptual pathway to that of the human. The computer, formerly a resident of the category of objects possessed of properties upon which a subject might act, becomes capable of action itself. Those environmental signals it is designed to perceive, whether they are possessed of subjectivities themselves, become objects. The space of potential affordances between subject and object becomes somehow more equally occupied by subjects and objects when objects demonstrate chimerical subjective properties—even if they are only prosthetic. In this emergent realm of pseudo-subjective objects, affordances become more apparently bi-directional, occupying the increasingly

porous membrane between the subject-object dichotomy: subjects that act on objects and objects that act on subjects by means of prosthetic perceptual pathways.

2.5.1 Ashton Revisits Ashton

It appears that Ashton's redefinition of IoT points to a proximal future in which computers and computation rise to the level of (prosthetic-)subjectivity so as to be unbound by the shortcomings of human-entered data. The result of such a rise, though, given that computers are not congenitally burdened with short attention spans, fallible memory, and socio-culturally imposed (or biological) time constraints, cannot result in an even ontological playing field. How quickly Ashton's argument might be stretched to a call for purely algorithmic living. Although this is a fascinating position, it does little to consider the discursive ramifications of an ontological flattening—the act of being a person in a systematic and discursively subtended society. Nor does it do much to foster a broader view of IoT in which users engage in a synergistic relationship with the 'smart' devices that will co-constitute the environments in which they live. The rhetoric seems to be that a human user (i.e., a subject) will perceive the characteristics of an object (i.e., IoT-enabled device, likely through a smartphone GUI) which will present as pre-processed information, and the human user will take a prescribed course of action. This says nothing, explicitly, about the constellation of human and institutional subjectivities that reside through the looking glass of this or that GUI. This does not constitute a flattening, but rather an inversion in the name of Big Data. An example of this relationship is already widespread: the use of GPS systems in navigating the world.

Ashton (2015) describes the role of GPS sensing in smart phones as core to the experience of the contemporary world: he says that it is difficult to imagine a world without it. This example is worth examining on at least two levels: first, because of actionable qualities that GPS systems possess; second, because of the potentially myriad and invisible subjectivities that couple with a GPS-enabled object at the same time an

individual user couples with it. With simplified regard to the former: the sensors in our phones locate us on a grid. Such locations, when augmented by other forms of data, often result in behavioral prescriptions (e.g., your phone tells you to avoid the 405 today because there is an accident a Beach Boulevard). Heeding this advice could be interpreted as 'being acted upon' by an object. That is, the smartphone—the object imbued with networked sensors—becomes simultaneously an object possessed of properties, but also a sort of passive aggressive chimerical object possessed of subjective actionable capabilities. The ethical valence of being acted upon—whether it is a 'nudge' (Thaler & Sunstein, 2009) or a shove, so to speak—is not yet important here. Rather it is the phenomenon of an object acting on a subject on behalf of ***n*** unidentified subjects that is of note.

Second, multiple subjects are simultaneously constellated around the smartphone that facilitates GPS-driven actions. On the one hand, there is the coupling of the user and the phone. As an (artificial) object in the environment, the smart phone presents certain possibilities for action relative to the subjectivity of the user. (One may choose to throw it in a river just as they might choose to use it for navigation.) On the other hand, however, there exists a realm of invisible affordances: they are invisible to the user because the user is not the subject in this particular subject-object coupling. Instead, those institutions and individuals that leverage data collected from the sensors embedded in the smart phone comprise the subjects.

In their designed abilities to gather data via prosthetic forms of sensation or perception, the object-components of 'things' in IoT begin to function like chimerical objects that possess subjective qualities. They act as subjective-proxies for the actants that have access to the data collected by smart objects. The construction of a 'thing' in IoT does not simply involve a singular subject and a singular object. Instead, the formation that appears to be central to IoT is the coupling of an object with *n* subjects, each of which are not necessarily known to the others. Unless we develop a toolkit for analyzing the values that are embedded in the affordances arising from *n* simultaneous subject-object couplings, we cannot realistically hope that many

of the values we cherish (e.g., the ability to find humor in the world) will survive the long leap over the implementation gap (Finn 2017).

2.5.2 Two Premises and a Conclusion

Without further uncovering and problematizing the ontological assumptions upon which the imaginary of IoT rests, we cannot assume that the values designed into a discursively-blind IoT will be congruent with those values that have come to define parts of our social experience. Ashton's position does not take into account the deep phenomenological problems of IoT if computational subjectivity is (narrowly) defined as the ability to 'observe, identify, and understand the world'. The combination of two premises and a resulting conclusion, derived from the reading of Ashton's text above, will illustrate the nature of these problems:

> P1: 'Thingness' is relational, bestowed to external objects by a process of sensorial or perceptual coupling rooted in a subject;
> P2: Separate, subjective systems of sensation and perception are not necessarily reducible to each other;
> C1: 'Thingness' bestowed by one sensing and/or perceiving system does not necessarily confer the status of 'thingness' relative to another sensing and/or perceiving system; 'thingness' is not necessarily transferrable.

The first premise here is justified by: (1) the person/computer dichotomy set up by Ashton in the second paragraph of his article; and (2) Ashton's (passive) assertion that information can be derived from the sensing or perceiving of things, and the idea that computers can be perceived of as things by humans based on sensorial and perceptual input.

The second premise comes from positing that if an IoT device is imbued with sensorial powers unburdened by such human shortcomings as limited attention, unreliable accuracy, and time constraints, then the aggregate total of data collected by such a device cannot be reducible to the aggregate total of data collected

by a system that *is* so fallible. The 'real world' ostensibly represented by the collected and stored sensations of sensing and perceiving computational systems is somehow more real than that which is represented by human-entered data.

Through an inferential process of abduction (Tavory & Timmermans, 2014) one could infer that the category of 'people' might be interpreted as the object-component of 'things' to any enclosed sensing/perceiving system that is ontologically separate. In this formulation, the subjectivity of the human user is possibly placed into a category of 'objects' from the perspective of another, separate system of sensation and perception. For those subjectivities that have access to aggregated data derived from such sensors, the subjectivity of the user is reduced to an object. In such an eventuality, the discourses that arise from and through the pre-IoT archive are fundamentally changed.

We posit that the constellation of subjects and objects that form around IoT 'things' should be understood as a system: a constellation of subjects that interact (blindly or knowingly) via their simultaneous couplings with a given object. Once understood as a system, it becomes possible to analyze the values that are designed into multiple simultaneous subject-object relationships by means of the separable sets of affordances that arise from these relationships. By analyzing the multiple sets of affordances that arise between subjects and a given object—thus constituting the 'thing' in IoT—it may become possible to abduce the values that are embedded in such a system. To do so, however, requires the work of scholars from multiple disciplines. As such, we agree with scholars who call for concerted research efforts to realize an IoT, but amplify their call for such concerted effort to include scholars in the humanities and beyond—philosophers, media theorists, designers, literary scholars.

We must, as it has been said, return to the things themselves. That is, when it comes to the study of a nascent, or at least quickly evolving subject such as IoT, it is not enough to assume the

validity of research or publications that benefit from the Matthew Effect or the (rightly deserved) reputation of their authors. If we are to make any meaningful progress towards understanding the nature of the Internet of Things—the extent to which it exists as both a social and technological set of discourses—then we must engage in careful analysis, not just of the language used to describe, define, and limit IoT, but of the relationship between subjects and objects that always already defines the 'thing.' Although it may seem pedantic, or outside the scope of such an engineering-heavy subject, its importance cannot be understated. Technical systems, even those designed in technical vacuums, always already become socio-technical systems upon adoption. The interplay between the social and technical that occurs in a sociotechnical system is never one-way. That is, the technical influences the social just as surely as the social influences the technical. If we are to remain enthusiastic about the possibilities to which IoT gives rise—efficiency, convenience, novel epistemic modes—then we must also be vigilant and apply such vigilance to the study of just what we're talking about when we talk about IoT.

These are murky waters. But this is not necessarily the case because of some inherent quality residing in any of the concepts in question—the Internet, things, people. Rather, the murkiness comes from the disciplinary spread of the topic at hand, an inherent quality of the synthesis of these three topics. The Internet of Things reaches across departments and sections of campuses from engineering and computer science, to information science, to media studies and literature, to critical theory and philosophy, to the arts and design. It is high time that treatment of this topic migrates to those areas of scholarship and between scholars in multiple fields.

It seems likely that Ashton's final statement is correct: "The Internet of Things has the potential to change the world, just as the Internet did. Maybe even more so." Given the potential ontological (and epistemological) power of the Internet of Things, we must come to recognize it as a subject

of study worth the attention of scholars across disciplines. It cannot simply be a question of building or engineering—some field of dreams arising from R&D labs and NSF-funded 'hard science' labs. Rather, it must be the subject of humanistic inquiry *in addition to* this.

To this end, and in the next section of this chapter, I conduct a close reading of another canonical piece of IoT literature: a piece by Neil Gross in which he prognosticates that 'In the Next Century, Earth Will Don an Electronic Skin.' Through a close reading of this piece, I identify not only the need for interdisciplinary (perhaps transdisciplinary) inquiry into IoT, but also concrete avenues for such inquiries.

2.6 On Gross: Multi-disciplinary Coloration of IoT

I begin here by reminding the reader that IoT writing generally utilizes one of three approaches. The first involves the presentation of simplistic, non-technical, and (usually) unsatisfying definitions. For example: "The term 'Internet of Things' denotes objects that have become seamlessly integrated into a digital network. For this, regular things, which could not communicate before need to be provided with an address often they also become equipped with sensors that can communicate their status or report on their environment" (Bunz, 2016, p. 1).[75] The second approach is mired in the technicalities of certain devices—a technicality from which the reader might inductively conjure a realm of protocols and circuitry. The third comprises generally fictional descriptions of smart object ecologies as they might be encountered or inhabited in everyday life.[76] In this third approach, network-connected objects are endowed with sensors that

[75] Much to Bunz's credit, however, she indicates that the point at which these objects begin to communicate is the point at which they become media, and therefore potential objects of study for media and communications theorists—a welcome and much-needed disciplinary call to action, and one that this dissertation is intended to further.

[76] As an example, Greengard's (Atzori, Iera, & Morabito, 2010), 'The Internet of Things,' from the the MIT Press'

collect data about a given phenomenon, or related set of phenomena, in order to automate or scrutinize a physical or memorial process or set of processes that are central to the mundane of everyday life—and yet these descriptions retain a certain cartoonish enthusiasm for the characteristics of our foregone sociotechnical future. For example, your refrigerator sends an alert to your smartphone when you're running low on milk around the time you start your commute home, informing you that you should stop at the market; your FitBit sends you an encouraging reminder you that you're 2,341 steps away from your daily goal, and it is only 9:27am indicating that your potential for achieving a calorie deficit is heightened for the day; a smart guitar-pick measures the efficiency of your picking pattern as you practice a line from Pink Floyd's 'Another Brick in the Wall (Pt. II)' so that you can build fluency in alternate-picking. Generally speaking, these descriptions are positive, lengthy, and tend to focus on generic use cases approached from a topical, non-theoretical vantage.[77] Collectively, they appear as persuasive pieces, discursive-topographical maps of the hypothetical givens characterizing our soon-to-be, aiming to naturalize an emergent genus of 'hopeful monsters' (Law, 1991).

These discourse-topographies are as hopeful as the monsters they represent—rather, they *are* the hope their monsters carry. Once relegated in cartography to regions of unexplored lands or seas, by catalyzing the need for new maps these hopeful monsters seek to become the subject of the maps themselves, the users, colonizers of material continents and cultures—the viewer, the viewed, and the means of viewing at once. That is, they are topographies of the sociotechnical expectations they themselves partially constitute. But in the present tense, divorced as thoroughly

Essential Knowledge series, begins with a day-in-the-life scenario: the interconnectedness of locks, garage doors, smartphones, and toasters is presented as a continual event as mundane as burnt toast – although one that would likely prevent such burning.

[77] Notable exceptions to this rule of optimism can be found (*cf.* Sterling, 2014), although pessimism or skepticism presents in the form of near-paranoia characterized by a world in which the user becomes the used and agency is distributed unilaterally to large corporations via the 'things' they control. Rarer is the piece of writing that leverages a disaster scenario to problematize aspects of IoT (*cf.* Johnson, 2016).

as possible from expectations of the future, they are *only* maps of expectations, necessarily exercises in enrolment (Callon & Law, 1982). In this way, engagement with this genus of monster begs reliance on a *petitio principii* fallacy: without their existence, the representational maps of the world they provide become meaningless, exercises in science fiction at best; without the promise of the maps, there is no need to engage with the trinket-strewn terrain.[78] The mechanism of transformation allowing a state change between hopeful mapping and the matching of the world to the map is what must come into question.

And yet, judging by the amount of effort invested in the publication of books, journal articles, white papers and technical specifications (not to mention the creation of videos, marketing materials, user interfaces, and conference schedules), enrolment into the imaginary of IoT—into the vague, but certainly networked, sensor- and data-driven realm of an efficient or convenient tomorrow—has all but been achieved for large factions of academia and industry. Much in the same way that E.M. Forster reluctantly concluded that a novel tells a story, so too can we conclude that, 'Yes, indeed, IoT is a possible future.' The ongoing enrolment into such a future, a processive linking of hearts and sensors and minds, deserves close scrutiny—whence the tolerance of the *petitio principii*? Does the inertial creep towards cybernetic realizations and post hoc validations of Actor-Network Theory (ANT)—a new, another 'control revolution' (Beniger, 2009)—speak to something deeper about the human experience? About the relationship between the core conceptual dichotomies of experience: the body and the brain, the natural and the artificial, the subject and the object, the past and the future?

[78] Humorists and serious critics alike have reveled in the pejorative tone of such terms as 'trinket' in public fashion since at least the summer of 2015, at which point the Twitter account and associated hashtag, 'InternetofShit' was created.

Answers to these questions can take many forms and find roots in many schools of analysis from across the disciplines. Not the most obscure of which would resemble an intellectual history of pervasive computing, a nuanced reading of Big Data, or an experimental-psychological treatment of interaction or design. But, as I have argued previously with regard to Latourian matters-of-fact and matters-of-concern, such an approach—one grounded solely in the weave of a given discipline or methodology, and therefore limited in its framing—such disciplinarily singular approaches would fall prey too easily to the moths of deconstructionist oblivion. It is not enough to assume one disciplinary or theoretical vantage point, and from there to critique the futures, the desires, or expectations, implied by IoT. Rather the appropriate vantage must be constructed as if through distributed, compound eyes, kaleidoscopic eyes. Such scrutiny must necessarily take place within the realm of the artifacts created: it must begin, in order to begin anywhere when a concept so slippery as 'things' is at stake, at the level of discourse.[79]

Two apparent avenues for action present at the mention of 'discourse.' As is standard in the Western languages, I'll proceed from left to right. To the left is found Foucauldian discourse analysis—a roughly structuralist endeavor, grounded in the theory of The Archive, intended to identify statements/events (énoncés) and the realm of conceptual and historical-narrative possibilities to which they give rise.[80] To the right is the discourse of communication, the discourse

[79] My reasons for including objects at the level of discourse will become clearer later. Suffice to say, for the present, that objects must be discursive if they are interpreted as the inscriptive carriers of statements/énoncés. This interpretation of objects has its roots in the document-based work of Lisa Gitelman (2014) and the historical approach to information science provided by Ann Blair (2010).

[80] I have elsewhere struggled to operationalize the types of possibilities to which The Archive gives rise. I have settled here on the notion of historical-narrative possibilities for three reasons. First, the historical tradition from which Foucault and his contemporary, if not collegial, Annees School counterparts, partially disembarked by addressing varying temporalities and The Archive is a positivist one—as in the tradition of Ranke, only those historical statements that can be positively verified can be considered as truthful, or possessed of some measure of ground truth from which to build an historical narrative. Second, although Foucault does not specifically use to term narrative, his archaeological work must ultimately build one. Such is the nature of events across time, especially when they are positivist in origin, even when they are narratives of breakage—there can be no 'breakage' without the construction of a narrative to break. Third, if one conceives of The Archive's contents as a set of discourses represented by inscribed statements/énoncés, then something like a narrative line—the line of a linear regression comes to mind—must be

of language. The most efficient avenue, as I hope to illustrate, is to be found somewhere between the two—an issue at the heart of Foucault's archaeological project. The left-hand option relies on a particular form of historiography, the method of archaeology first described by Foucault, designed for his purposes of identifying breakage. (But I do not intend to reference the breakage of contemporary jargon—disruption with its catchphrases and marketed, misspelled apps. There will time for that later.) Rather, by breakage I mean to imply the identification of gaps between discourses as they occur across time, and indeed, as they occur towards the shaping of our notions of time, the categories of duration by which we make sense of our past and project ideas and embodied epistemologies into the future. Within the context of Foucault's archaeology, this identification of discursive gaps occurs at the point at which archives meet The Archive—this is the point at which archival material, as objects, are encountered and engaged in a present tense by the addition of subjectivity, of a user or reader engaged in the creative/productive acts of selection and recombination. Put differently, this is the point at which the combined objects of the archive and the subjectivity of the reader grant fleeting access to the imaginary.

Unless the only goal of the current work is to analyze the construction of expectations relative to the future of IoT—and certainly this is part of the goal—it becomes necessary to seek deeper grounding in the tradition of archaeologies physical, epistemological, and literary, to let speak the conceptual foundations upon which this Internet of Things is placed—'*res ipsa loquitor'* (Cicero); 'Stones talk!' (Derrida, 1998, p. 93). In order to do so, it becomes necessary to look not to the present or expected future, but to the recent past wherein the concept of IoT was birthed. Moreover, then, before approaching the things themselves—the bits and bobs imbued with sensors and data-communicative functionality—the primary things, the things to which foundational

constructed in order to best represent the set if the sense made from the set is to be positivist.

attention must be given, comprise the literature of IoT. More specifically: the literatures from which the term 'internet of things' arises.

2.6.1 A Close Reading

As discussed in the previous chapter, Kevin Ashton is generally regarded as the first person to utter the phrase, 'Internet of Things' (Ashton, 2009). However, reliance on Ashton's account of the 1999 meeting in which he coined the term comes with insurmountable historiographical problems: there is no publicly available record of this meeting, nor are slideware or transcriptions available for analysis. As such, the event of the term's coining exists in the archive as merely the shell of an event—a date on a timeline remembered in detail only by those select few who happened to be present at the meeting. What resided at one point inside that shell now proves all but inaccessible to others. As such, and particularly because of the prominence of citations to Ashton's 2009 description of the event in the IoT literature, it becomes necessary to find an alternate linguistic route through which one might gain entry into the discourses of IoT.

It has been difficult in reading the IoT literature to identify more generally applicable or more succinct summation of its early character than that provided by Neil Gross in a nearly twenty-year-old issue of BusinessWeek: "In the next century, planet earth will don an electronic skin" (Gross, 1999).[81] This opening line of a short journalistic piece hints at IoT's potential and existence *as potential* in a present tense that leans and slouches, staggers and runs and leaps in all of its technological manifestations from the interior of the extended present tense into the exterior of the

[81] This is the same year in which Kevin Ashton coined the term, 'Internet of Things' (Ashton, 2009).

future. This is the IoT of the extended moment, a perpetual event in time extending across the tenses and built upon the armature of prosthetic sensors and the big data they collect. Gross's prognostication speaks to the heterogeneity and fluidity of the modern taxonomy, not only of subjects and objects, but of the increments of time by which their existences are measured—it is a statement about zoom and specificity. The statement is about the expectations of a future grounded in an assessment of the current sociotechnical landscape; it is about what it will mean to be an embodied agent in the transition from one age to another. Finally, it is about the boundaries of that embodiment.

Beyond its succinctness, which hides a density worthy of philological analysis, even the circumstance of the statement is difficult to best when seeking a beginning: a sociologist, a practitioner of Comte's most venerable science, writing for a broader audience in the glossy pages of a popular magazine. Such is the double, if not manifold, nature of IoT not captured by topical system descriptions. Its reach extends across otherwise clear-cut categorical boundaries—those taxonomic trappings of the would-be Moderns so adeptly dissected by Latour (1993)—from the rarified labs and R&D divisions in academia and industry, respectively, to the households and pockets, cars and bags of the everyday person. Through its categorical breaches, IoT connotes an epistemic mode of being wherein, as the saying goes, "'numbers' beats 'no numbers' every time."[82] In this expected mode, however, the visibility and accessibility of these numbers is not a given assumption. This is the mode of being implied by Gross's 'next century,' a century of the prosthetic sensory devices that populate our emergent 'age of potential memory' (Bowker, 2005). Such a mode becomes more clearly visible through close analysis of the statement, which I will begin at the ground floor, the grammatical floor, so as to build upward

[82] I have heard this saying attributed to John Leslie King, although never formally.

In conducting a close reading of Gross's statement, I aim to develop a preliminary impression of the discourses involved in IoT—to construct and interpretation of the archival set of IoT derived from the subjectivity represented by Gross's statement. In particular, this impression will concern the discourses that (at least partially) comprise 'IoT-as-potential,' and therefore are implicitly constitutive, in-part, of the sociotechnical imaginary of IoT as it was constructed during the year that has come to be regarded as the *annus mirabilis* for the term 'Internet of Things.' These discourses, referred to as concepts or conceptual constellations, will be identified and numbered in what follows. Once I have concluded my reading of the sentence in question, these conceptual constellations will be presented and summarized.

The sentence, 'In the next century, planet earth with don an electronic skin,' consists if two main elements: a prepositional phrase and an independent clause. Both will be analyzed in-depth in order to identify a constellation of discursive elements—and therefore conceptual elements influencing the realm of possibilities present in the sociotechnical imaginary—each of which, singularly, provides a vantage from which to survey IoT. Collectively, they will present a fuller, multi-faceted impression of just what discourses undergird the heterogeneous discourse of IoT. The prepositional phrase sets the tone of the sentence, its temporal boundaries and place—albeit a place extant only in expectation, in the continuation of work-as-usual despite the recent chorus of 'disruption.'

A: "In the next century, […]"

Although it is tempting to begin analysis from the place of the noun, 'century,' it is the adjective, 'next,' that provides the most productive point of access:

A_1: “[redacted] next [redacted], […]”

Here, all other information being removed, ‘next’ indicates a series. More than that, it indicates a demonstrable or observable break between necessarily proximal statements/events contained in a series. (There is no ‘next’ without proximity as it occurs in either, or both, the spatial or temporal dimensions; similarly, there is no ‘next’ without the cessation of the ‘former,’ that which is succeeded.) The reader’s next step, so to speak, is to identify the type of ‘next’ in question. Such identification occurs by way of the definite article, ‘the.’

A_2: “[redacted] the next [redacted], […]”

The definite article, ‘the’ provides concreteness for this ‘next’— that which comes next, graphically subsequent to ‘next,’ is not presented as ‘a next,’ an indefinite possibility, but as a definite certainty. It is an individual and singular object. From this two-word construction alone it is possible to deduce that whatever is to be discussed presents as an expected and definite sequential extension of that which resides proximally before it in its series. The as yet unread noun is already defined against expectations set by the backdrop of what has come before it. The issue at hand becomes the comprisal of the series:

A_3: “[redacted] the next century, […]”

With the revelation of the modifier's noun, the expectation inherent in 'next' becomes apparent. With the knowledge that this sentence was written in 1999, 'the next century' clearly presents as a future object. This 'next' is not 'the next' as it exists in a fully known series, as in a slide in a presenter's pre-arranged PowerPoint deck. It is rather an assumption about what will succeed the then-present state of the 20th century. In other words, it has not yet come to be and is therefore an expectation—expectation being evoked by the combination of the series to which 'century' belongs and the notion that the next century has not yet continued the series. (One does not say, 'I'll take the next one,' knowing that another, less crowded, elevator will never arrive.) This is clearly, then, a statement about time as an orderly occurrence and the conceptual-taxonomic means by which we maintain time as orderly.

But as much as century reveals a broader sense of 'next, the term 'century' deserves closer focus, itself. It is a point of interest because of its resonance with a temporality mostly beyond the realm of direct human experience. 'Century' provides an armature, an imposed linear scope that places the sentence's subject matter in the realm of the historical, perhaps the infrastructural—albeit a projected historical or infrastructural. The duration of a century, although possibly understood as a temporal container for what has been called 'biographical rhythms'(Jackson, Ribes, Buyuktur, & Bowker, 2011), is somewhat greater in duration than the average human life expectancy. [83,84] The measures of its meter begin and end at points distal enough to fully encompass a human life, the lived bio-graphing of a biographical rhythm. This greater rhythm is beyond 'time as the individual understands it, time in our daily life,' and approaches the realm of 'a history

[83] This is especially true given the acceptance of Hobsbawm's (Hobsbawm, 2010b, 2010c, 2010a) notion of the long nineteenth century—the century as a demarcation of a beginning and an end need not be constrained by a centenary, but can extend for thematic reasons somewhat beyond. The inverse also appears true in Habsbawm's discussion of the short 20th century. In either case, it is clear that the notion of the century is derived from narratives that encompass more than that which is directly experienced in the duration of a given biographical rhythm.

[84] The World Health Organization provide a worldwide average life expectancy of 72 years as of 2016 ("WHO | Life expectancy," n.d.).

which measures in centuries: […] the history of the long, or even the very long, term' (Braudel, 1970, p. 147, 148).

Thus far, then, from my reading of this short prepositional phrase we have as follows: the expected progression of a unit of time elapsing at a rhythm somewhat greater than that of a human life. Furthermore, this progression occurs in relation to the series of epochs comprising 'the past,' and will appear similar to those that have preceded it: this next century has the qualities of the historical projection that allows for it.[85] Two key conceptual constellations can be identified as central to this prepositional phrase, and therefore relevant to the framing of the IoT discourse: (1) the relation and duration of elements in a time-based series that unfolds at a rhythm broader than that of a human life and (2) the construction of expectation regarding what is to follow in such a time-based series.

One more small grammatical element, constituting a third key conceptual element, must be addressed before treating Gross's independent clause. That is the preposition, which returns the phrase to its original presentation:

A: "In the next century, […]"

This preposition places Gross's schema for what's to come in the ablative case.[86] That is, it is possible to approach the idea of what might come next only 'by means of' a previously extant schema—in this case, Braudel's history at the level of the century or centuries, or a (relatively)

[85] It is quite likely that this reading, seventeen years after such a small sentence was written, strays from what Gross might have thought. However, given the trap door underneath the analysis of an author's intent (i.e., the intentional fallacy), I believe such a late reading is valid (Wimsatt & Beardsley, 1946).

[86] John Dunham-Peters presents a succinct discussion of the ablative case in terms of its relevance to media theory in his recent 'Marvelous Clouds: Toward a Philosophy of Elemental Media' (Peters, 2015). In this work, he traces the ablative case in media to a letter between Walter J. Ong and Marshall McLuhan.

longue durée. Without a functional notion of history and the systematic organization thereof (i.e., centuries, ages, epochs, decades, etc.), this prepositional phrase, a context for what's to follow, would be impossible. To envision a future is to rely on the constancy of the concept of the past. In this regard, it is possible to approach a discussion of the future as a discussion of the past, an expected trajectory. As such, to the list of identifiable conceptual elements indicated by Gross's prognostication, we now add (3) the ablative case as it relates to the concepts by means of which the world as phenomenon-in-time is organized. This ablative case indicates that what is to follow in a series of centuries is always already defined against the backdrop of the 'century;' Gross's future occurs within a certain framework of the past. With these three conceptual constellations in mind, and providing ample context for the independent clause, a reading of the independent clause is now germane.

The independent clause concluding Gross's statement consists of five grammatical elements: a subject and its modifying adjective, a verb and its tense, an indefinite article, a direct object, and an adjective that modifies the direct object.

B: "[…] planet earth will don an electronic skin."

From this succinct simplicity arises discursive complexity. As in the prepositional phrase, I will begin my reading with the adjective, 'electronic.'

B_1: "[…] [redacted] electronic [redacted]."

Already grounded in the modified *longue durée* expectations of a slow and linear past-to-future motion occurring at comparatively augmented rhythm, 'electronic' places Gross's prognostication within Bowker's (2005) age of potential memory—an age facilitated by the proliferation of electronic means of record keeping. If the century in question is to succeed the 20th, and in an electronic manner, then it must do so with some relation to the advances of engineering and colonial empiricism that characterized the 20th. (Indeed, 'next' in the prepositional phrase implies a furtherance of such a tradition, a transformation or evolution belonging to, but different from, the science that has come before.) But 'electronic' has a greater function, a function that is found in its negative space, or that to which it specifically does not refer.

The Oxford English Dictionary (OED) provides two relevant definitions for electronic, which will help illustrate:

> (def. 2a) "Of a device: operating according to the principles or methods of electronics, such as a transistor, microchip, or electron tube; operating by means of or employing such devices,"
>
> and
>
> (def. 2c) "Using or involving the storage or transmission of information by electronic means; carried out or performed using electronic devices or computers."

The first definition lays the foundation for a singularly artificial domain: that of the invention or contrivance, the device. In the second, this domain is broadened to include usages. It is this second definition that pushes the artificial into the realm of the prosthetic. The broadly artificial becomes the specifically prosthetic at the point at which one deduces a specific implication: electronic means of storage and transmission are only requisite in-situations where the standard kit of human communication, or indeed pre-electronic forms of augmented communication such as the written letter, does not suffice—where the voice, the body, and the memory, paper, pen, and envelope are

obsolete for reasons of distance, durability, urgency, or sheer amount of information. In short, the 'transmission of information by electronic means' acts as a signifier for the mediation of electronic inscription, an augmentative and prosthetic inscription.

Within this domain of communicative prostheses, the human agent is implied, but not specifically implicated. Indirect focus is given to the concept of inscription, a necessary precursor to the non-verbal storage or transmission of information. Logically, this act of inscription is the only necessary precursor to information being stored or transmitted by electronic devices. It is not required that a human be involved in such inscription—perhaps involved at the level of designing an automated inscriptive mechanism (i.e., a sensor recording date about an operationalized phenomenon), but not necessarily so. This exclusion of the explicitly human constitutes the primary negative space of the term 'electronic.' By choosing to modify the clause's object with 'electronic,' Gross concretizes the subject, verb, and object as belonging to a domain that is (at least partially) uninhabitable by the human—or rather, a domain that is not anthropocentric. It is a liminal domain of inscription unto itself. From this reading of 'electronic,' we can add to the list of relevant concepts: (4) inscription; (5) the locus of agency. This reading of the term bears out in analysis of the remainder of the clause, which I commence by considering the term, 'skin:'

B_2: "[…] [redacted] electronic skin."

That 'electronic' modifies the clause's direct object, 'skin,' presents as a curiosity given the previous reading of 'electronic.' Several meanings of 'skin' are possible, each with resonances in different domains including biology, philosophy, design, and human-computer interaction (HCI).[87]

[87] As might be expected, the referents of 'skin' have their own history.

Each of these resonances, as we shall see, alludes to a taxonomic chimera—a synthesis of the biological and the artificial. (Perhaps in the vocabulary of the Moderns, this would be better phrased as the natural and the sociotechnical.) Within the chimeric category that is created, the agency of such otherwise human acts as inscription is distributed across human agents and non-human actants.

The first and most apparent reading concerns the biological facet of 'skin.' This facet includes the two primary definitions provided by the OED: 'the natural external covering or integument of an animal removed from the body,' or 'the external covering of the body of a person or animal.' In both cases, 'skin' implies an innate and observable boundary between two simultaneous, but differentiated states: that of internality (i.e., an organism) and that of externality (i.e., its environment). In the same way that my reading of the term 'electronic' identifies a liminal state of inscription residing between the purely human and the purely non-human, any reading of 'skin' in an electronic context must trouble the purity of the internal/external dichotomy.

In the early days of behaviorism (perhaps *the* defining 20th century expression of reductionist empiricism, exclusively concerned as its practitioners were with "*observables*, i.e., input-output relations") the skin-as-boundary came to be understood as what we might now flippantly call a meat-space interface (Chomsky, 1959, p. 27). The behaviorists' (sk)interface received temporally bound, tactile signals from the external environment. These signals traveled along the routes of the nervous system and resulted in a response from the organism—an input-processing-output structure similar to that presented by von Neumann (von Neumann, 1982). The skin, then, in this early understanding of its role as sustaining the internal/external, organism/environment dichotomy was as a functional black box.[88] The contents of the box

[88] Not a Skinner-box, but a skin-box.

apparently mattered little so long as its primary functionality could be observed: the observation of the skin in relation to behavior provided empirical evidence of a natural, always already extant dichotomy between organism and environment. This barrier need not be reduced any further because it validated itself in its involvement in observable phenomena. But is this all the skin does? Do the contents of the box matter, or will a behavioral-functionalist understanding suffice? The answer must be, 'No.' In unpacking the black box a space the possibility of a space between the internal and the external is created.

Aspects of the functional dichotomy between interior and exterior are still central to the contemporary medical understanding of skin, despite marked progression in the field of physiology since the heyday of behaviorism: "The skin's most important function is to form an effective barrier between the 'inside' and the 'outside' of the organism" (Proksch, Brandner, & Jensen, 2008, p. 1063). However, the contents of the black box of skin-as-barrier have largely been unpacked, and the primary substance of the physical barrier identified:

> The physical barrier mainly localized in the stratum corneum (SC) and consists of protein-enriched cells (corneocytes with cornified envelope and cytoskeletal elements, as well as corneodesmosomes) and lipid-enriched intercellular domains. (Proksch et al., 2008, p. 1063)

In that its function as a barrier has been localized to one structure partially comprising the 'skin' as a whole, one can deduce that there is more to 'skin' than simply a barrier. The skin, therefore, is a heterogeneous body consisting of different structures. From this heterogeneity, still another concept emerges as potentially relevant to IoT. The 'electronic skin' to which Gross refers is likely comprised of myriad smaller units (i.e., devices), which, when combined, give the total appearance of a skin. So, we must keep an eye open to: (6) the heterogeneity of components.

In this heterogeneity, in this unpacking of the skin's black box, the reader encounters a Gestalt problem of nearly infinite interest. The skin can, indeed, be viewed reductively as an identifiable and observable phenomenon—a barrier. From what might be called a standard vantage, this is most generally the case. (It would be odd for anyone but a dermatologist to look at my face and consciously think of my nose as an armature for a portion of my stratum corneum—and even then this would be cause for concern outside of a doctor's office.) However, when viewed from the vantage of a greater magnification, the skin in its entirety is broken down into constituent parts. It is also possible, given the appropriate intensity of magnification, to classify these cells into different categories belonging to different layers of skin. But here's the problem: none of these, when summed, add up to the 'skin' we inhabit. They are the components of our boundaries, but not the experience of being bound, of living in and interacting with the world by means of a (sk)interface. While one is both reductively bound by skin and anatomically and physiologically comprised of its contents, the experience of this binding and comprisal occurs where the boundary between internal and external is blurred. It occurs in the liminal space where internal and external meet, the point of interaction.

Where there term, 'skin,' in Gross's statement is read in a primarily biological way, it is possible to understand skin as both a barrier demarcating interior from exterior and organism from environment, but also as a space unto itself—an inhabited and heterogeneous locus of interaction which, although apparently fortifying the internal from the external (and thus defining what is considered 'internal'), is comprised of its own ever-present, transient liminality. From this first, biological reading of 'skin' we can add two more concepts to our discursive, IoT laundry list: (7) the categories of 'internal' and 'external' and the existence of a liminal space between them.

A second reading of 'skin' further concerns its role in empirical knowledge production, but more directly considers its philosophical implications. In this context, the skin functions as a *de facto* boundary between an 'inner knower' and 'outer knowns' (Bentley, 1941, p. 10). As such, the skin is again considered as a boundary:

> What holds 'inner' and 'outer' apart? The answer must come not by way of transcendental build-up but by indications of pertinent fact. Bluntly, the seperator is skin; no other appears […] Body has skin for boundary, and skin thus fences off the mortal residence (Bentley, 1941, p. 3).

Bentley's critique ultimately rests on the aspiration of generalizability within the practitioners of empiricism—particularly as the proliferation of empiricism influenced epistemology up to the mid-twentieth century. In structuring empirical research such that the skin functions as the boundary between 'knower' and 'known,' a logical flaw is manifest: nothing of the inner process of 'knowing' can be generalized in such a way as to apply to meaningful human behaviors. Among these behaviors, Bentley includes specifically, "lovings, hatings, buyings, votings, fightings, helpings, talkings, schemings" (p.10). Instead, one finds reliance on the strictly reductionist forms of empiricism like behaviorism, which cannot approach his chosen human behaviors.[89] In order to achieve even an approach toward generalizability, Bentley argues, the role of the skin must be positively accounted for—to invoke the role of the skin as a boundary between internal and external as an engine for knowledge production is to participate in the *petitio principii* fallacy, and a tautological one at that. The skin as a boundary between inner knower and outer known is only

[89] Interestingly, Bentley names B.F. Skinner as a qualified torch-bearer for a more nuanced form of epistemology, but admits an unfamiliarity with his work.

suitably engaged in empirical analysis if one takes its validity as a given assumption, a pre-condition.

In spite of Bentley's critique, and largely as a result of advances in the design and engineering of computing technology, a new validity colors the problematization of 'inner knowers' and 'outer knowns' by way of the skin. The 'electronic skin' to which Gross refers represents just such a newfound validity. Such an electronic skin *is* presently provided as a given assumption. If the skin exists as a heterogeneous collection of structures that constitute an transient interstitial interiority, then the conceptual set including 'interior knower' and 'outer known' undergoes a topological transformation: the point comprising the boundary between knower and known is transformed to reveal the liminality that simultaneously separates and merges the two. Moreover, Gross's electronic skin allows for the possibility that this liminal space is comprised of a heterogeneous constellation of human and non-human actants. That is, it provides for an extension of the 'interior knower' that is formally exterior to the human, but resident within the liminal space that partially comprises the categories of internal and external.

Whereas Bentley discusses 'knowings [as] forms of human behavior' (p. 5) at a temporal rhythm much shorter than that of evolution or centuries, but minute-to-minute in his list of gerunds, it is possible here to understand 'knowings' as the designed behavior of the sociotechnical 'organism' encased by an electronic skin. (If the measure of temporality can be augmented to such an extent as to address Braudel's *longue durée*, then it must also be capable of withstanding a diminution to such an extent that it can account for the measure of micro-seconds at which history unfolds for the digital device.) As such, whatever is to be encased in 'an electronic skin' is potentially residence to a novel form of 'interior knower,' the behaviors of which occur at a

temporality much less durable than that of the human. From this reading, we find further additional, faceted support for each of the conceptual constellations listed hereto.

Finally, we arrive at the third reading of the term, 'skin:' a largely HCI-based reading. It concerns graphical user interfaces (GUI). Contextualized by the hardware/software dichotomy within computing, particularly in the late 1990s, the term 'skin' refers to a customizable visual-thematic element of a given GUI.[90] In this usage, however, one finds a facet of 'skin' absent from the biologically and philosophically grounded readings above, but implicated in the Gestalt issues they raise, that there is an aggregate effect of skin that cannot be accounted for within a reductionist epistemology: the notion that skin can be chosen for either functional or aesthetic reasons—that an identity can be expressed or suppressed, represented or overlooked by the application of a given skin to a software's GUI. This reading of 'skin' constitutes an interesting addition to the fourth of the conceptual constellations so far derived from this reading: (4) inscription. As described by Derrida (1998), the skin can also be a site of inscription.

Writing of the case of circumcision in symbolizing Jewish heritage, Derrida suggests that such a form of inscription represents entry into the archive of Jewishness. Adapting this notion to the reading I've developed, such an inscription can be read as an historical signifier—that is, an inscribed and symbolic communication that contextualizes the short rhythm of a human life within the augmented rhythm of centuries. If the skin is a barrier, it is a barrier that can be rendered symbolically porous at the level of long histories; skins of the present can be inscribed into the categories of the longer past. Moreover, such an inscription is not born of communicative necessity, but is rather a choice. In other words, there is human agency in the act of choosing a skin. It is

[90] The OED documents a usage of 'skin' in this way from 1998. My own anecdotal experience of being a teenage Windows and WinAmp user, in particular, supports this. As I recall, I applied a Led Zeppelin skin to WinAmp.

clear from this third, HCI-related reading of 'skin,' that the concepts of inscription and agency are, indeed, relevant to any discursive analysis of IoT.

The importance of agency in the discourse of IoT becomes all the more apparent by returning to Gross's statement. In particular, by returning to the indefinite article that precedes 'electronic skin:'

B_3: "[…] [redacted] an electronic skin."

Opposite the case in the prepositional phrase, the indefinite article, 'an,' indicates that, while the 'electronic skin' in question will be real and observable, the configuration of its constituent elements remains a potential. '*An* electronic skin' exists as one of a set of possible skins, whereas 'the electronic skin' would refer to the definite manifestation of the set. From this little article it is possible to conclude that the taxonomic chimera of 'electronic skin' exists for Gross as a potential, as an expectation. In that it exists as a potential, it is possible to deduce that there are forces that will contribute to its realization. For the time being, I posit that these forces are, at least in-part, comprised of different agencies that present in the liminal space at the boundary of what is now a multi-faceted internality and externality.

The indefinite possibility of 'an electronic skin,' as well as the agency implied in choosing such a skin comprised of smaller, heterogeneous units, is further supported by the clause verb and its tense:

B_4: "[…] [redacted] will don an electronic skin."

‘Don’ refers to the act of putting on clothing, or more generally, anything that is worn over a body. From this, and combined with the future-certainty of ‘will’ (as opposed to ‘may’) it is already clear that the subject of the sentence demonstrates agency. But, as if the categorical synthesis of the device and the biological in ‘electronic skin’ weren’t rich enough, the agency of the verb and the certainty of its tense is complicated by the introduction of the clause’s subject:

B: “[…] planet earth will don an electronic skin.”

Planet earth, although certainly the object of human agency when contextualized by the anthropocene, is not a subject that is commonly bestowed with agency. As such, the direct mention of ‘planet earth’ seems a grandiose, rhetorical gesture. It provides the statement with a ubiquitous reach—the entirety of the earth being its scope. However, that ‘planet earth’ acts as the subject also indicates that this electronic skin in question will encase the entirety of our daily lives. In so doing, this electronic skin—received rather than chosen and built slowly as the rhythm of centuries unfolds—comprised of heterogeneous devices receiving input and transferring/storing information, appears to constitute a new ablative case through which, or by means of which, we will know the world. This ablative mode of being, by means of which we will remain ‘inner knowers’ in an experiential and biological sense, comprises a transient liminal interiority to which we cannot belong in a durable way. In donning and electronic skin, the earth assumes a renewed role as rich, potentially undifferentiated, ecology of natural and social, but one that is bound by the skin of the artificial.

The reading of Gross’s statement I have done has allowed a view into a set of discourses, or discourse constellations, that partly populate the archive of IoT -- not an archive of historical

statements and events residing on bits of paper that have been institutionally preserved (as in the case of Foucault), but a living archive. The archive of IoT is an archive of the present, and archive in motion where the motion of archival mediation (i.e., from paper to video to digital etc., as described by Rossaak) is the very motion of the phenomenal world we inhabit. The archive of IoT is the very skin of the world, the ablative layer of knowledge productive sensors, FitBits, guitar picks, smart cars, iPhones and Nests, through which we carry out the mundane acts of life -- and by this I mean to imply the most inclusive list of actions possible, as daily life is by its very definition mundane. This is the archive to which we must gain access in order to suitably approach IoT as both an epistemological phenomenon and ontological phenomenon. In uncovering a small set of resonances resounding from Gross's statement, I have illustrated that the discourses comprising IoT are varied. They traverse disciplines and methodologies -- they are heterogeneous in composition and complex in expression. Moreover, they reconstellate and express and suppress in real-time. Several thousand words into a close reading of eleven, we begin to see a discursive silhouette of IoT. I have tentatively identified the characteristics of this silhouette in the form of seven discourses. To review, these are as follows (and in the order in which they appeared above):

(1) The duration of elements in a time-based series that exceeds a human lifespan;

(2) The construction and maintenance of expectations of time-based series;

(3) The ablative case as it relates to futures resident in the present;

(4) Inscription and its role in constructing futures within the present tense;

(5) The locus of agency in inscribing and reading and creating futures;

(6) The heterogeneity of components through which the future is represented;

(7) The categories of 'internal' and 'external' and the liminal space between them.

These seven concepts can be divided roughly into two categories: temporal/historical theoretical context and concepts that require direct empirical evidence to explore. The temporal/historical category makes sense even at first glance: things exist across time, and in existing across time, they provide the binding agent that allows for continuity or discontinuity between historical *a priori* conditions and the epochs that arise from them. So, then, much of what will follow in the form of empirical analysis will address the means by which we might come to understand the rise of the Internet of Things as not only an historical event in the past, but as an historical event that currently unfolds into a set of potential futures. This, in its most basic sense, will comprise an investigation of the Internet of Things as an archival phenomenon.

Items five, six, and seven in the list above—although always already concerned with history—require some empirical investigation. That is, it is not enough to simply identify questions about the location of agency in IoT, the composition or taxonomy of heterogeneous objects that populate the field of IoT, or to identify the fact that depending on the taxonomy of actors one creates relative to IoT, there is a slippery slope protecting any real understanding of just what it might mean to live 'inside' or 'outside' a world defined by a ubiquitous Internet of Things.

Moreover, it is not enough to simply say that: there is a relationship between the archival forces of history and time and the more immediate physicality of objects. We must define that relationship. In order to do so, it becomes necessary to remove ourselves from the scholarly literature to a certain extent. That is, if we are to begin to understand the archive of IoT—what it might mean to be a human in IoT, what the 'things' that comprise IoT are—then we must put our mental and methodological boots on the ground, so to speak: we must approach and engage with the social imaginary of the Internet of Things. Following an introduction of the concept of 'social imaginaries', the next chapter is dedicated to explaining just how I will do this.

2.7 The Social Imaginary

As was demonstrated in the close readings of scholarly literature presented earlier in this chapter, IoT is both nascent and ill-defined. It is partly 'ill-defined' in the sense that there is no extant definition shared across researchers, departments, universities, and, indeed, nations; it is also ill-defined in that extant definitions demonstrate a certain interdisciplinary poverty. In its relative youth and unsettled conceptual configuration, IoT is rapidly changing. As such, it is my position that as broad an understanding—and therefore definition—of IoT should be adopted as is possible in order to avoid the premature concretization of IoT as a purely technical—or even predominantly technical—phenomenon. This includes employing theoretical contributions from across the scholarly disciplines, but it also must involve definitions that exist outside of scholarship.

But here 'definition' is troublesome. (This is not a task for the venerable reference librarian or solely a task for the OED.) Insofar as IoT promises an infrastructure that will impact myriad aspects of daily life, the notion of a 'definition' of IoT needs to be expanded to include those subject-object relationships—possibilities for action and the discourses that those actions subtend or dissolve—that will bound what might be done in a world of IoT, but not necessarily done towards or for IoT. 'Definition,' then, must expand from the staid page and the normalizing effects of 'x is y' formulations to include the realm of experience, the realm of possible experience: our definition must come from both scholarly understandings and popular understandings that do not stop (or indeed necessarily begin) with words on a page, but rather with the space of our language that describes things in both its oral and inscribed forms.

In that it is often framed in terms of potential futures, one might argue that IoT is not even real, but rather a projected state of possible functionality that will characterize some future world—in this way it appears as a technotale. (At the very least, IoT is a critique of efficiency, convenience, and the authorial slouch towards a big-data-driven third-person omniscient.) In so far as IoT *is* real—its researchers collect funding, its objects populate the world in the form of 'smart' devices—it does not benefit directly or apparently from the concretizing effects of history and the conceptual infrastructure of historical study, nor does the researcher interested in it. What scholarly work comprises the canon of IoT research might fit into a small corner of the archive that houses scholarly work on nearly any other field with sociotechnical implications so potentially widespread.

Instead, IoT presents as an imaginary: a reality-adjacent realm of pre-cognitive potential (pre-cognitive because it forms, through accumulated experience, the boundaries of what actions or statements may or may not be acceptable or, indeed, possible) in which the notion of 'sensor-imbued, network-connected everything' is superimposed on the image of the world as we know it. More specifically, it presents as a 'social imaginary' (Taylor, 2004). This notion of the 'social imaginary' provides us with suitable theoretical footing to begin scanning the terrain for a shared, if tacit or implicit, discursive constellation that *is* IoT.

I use the term 'social imaginary' to approach a broader (archival) understanding of IoT in the much same way that it was used by the philosopher Charles Taylor:

> By social imaginary, I mean something much broader and deeper than the intellectual schemes people may entertain when they think about social reality in a disengaged mode. I am thinking, rather, of the ways people imagine their social existence, how they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlie these expectations (Taylor, 2004, p. 23).

Because the weight of what follows must be supported by this notion of the 'social imaginary,' Taylor's initial definition deserves some unpacking. In being 'broader and deeper than the intellectual schemes people may entertain,' the conceptual terrain of Taylor's 'social imaginary' eclipses that which might otherwise be claimed by such notions as representationalism and the ubiquity mental maps it always already assumes. The social imaginary is not something constructed by overt logic or by any one disciplinary understanding of the world—nor can it adequately be described in cognitivist terms as an inner representation of the outer world—but rather by the richly experiential process of being-in-the-world, of navigating the cultural-historical milieu into which one is born. Such a process is one of accretion and excretion, of remembering and forgetting, of generating heuristics for living out the mundane. Each of these acts and their reciprocals give rise to assumptions about how the world—the social world, which, if we are to put the necessary weight on the relationship between subjects and objects, must always already be a sociotechnical world—functions and what might be expected of it. Indeed, the sociotechnical foundations of the social imaginary can be detected in Taylor's following formulation: "I am thinking, rather, of the ways people imagine their social existence, how they fit together with others, how things go on between them and their fellows" (Taylor, 2004). A cursory reading provides 'social existence' and 'their fellows' with human referents; any deeper consideration of these phrases, however, must include the ablative objects through which the social world is achieved, as well as the notion of 'fellow objects.' (Here, I expect resonance with, echoes of, Cartesian dualism: if the mind and body are generally [even though likely inaccurately] conceived of as coupled but separable, then any notion of a human as 'fellow' already implies an object component coupled with a subject component. Such implication logically, then, opens the door for the inclusion of any and all objects in the category of 'fellows.')

In this light, the social imaginary constitutes a spectral heuristic, an implicit modus operandi for being in a world that is characterized by the discursive constellations of a given historical *a priori*. As stated earlier—but it cannot be overstated—the social imaginary presents as the heuristics through which life is lived in a contemporary, observable, and experiential layer of the archive: that of the present tense, of the *lebenswelt* (Husserl, 1970), of the *habitèle* (Boullier, 2014).

The social imaginary, then, is something constructed by inference and expectation, but based on experience. Both inference and expectation in this definition are relative to a subject's understanding of how they 'fit' in the world in which they live: how they fit into, and what they can expect from, the greater archive of the world-as-text (as something inherently interpretable). In writing that social imaginaries refer to the 'ways people imagine their social existence,' Taylor deftly moves to a level lower, more fundamental than that of a cognitive map or a representation. He moves to the forms of thinking—the assumptions—that subtend any possible mental representations of the social world; he moves to sets of 'givens.' Again, one might say that he moves 'social imaginary' into the realm of pure inference based on the subjective and idiosyncratic (within normative bounds) sense made of prior experience—or for that matter, experience that is presented in narratives, songs, and even possibly the experiences of our ancestors as passed down through genetic transmission.

Based on this initial reading, it would appear that Taylor is constructing a purely theoretical notion despite claims of moving beyond 'intellectual schemes.' Given the environmental embeddedness that is assumed in visions of IoT, approaching the topic from such a lofty theoretical remove would be of little value. But Tayler goes on to further characterize the social imaginary as explicitly hyper-theoretical, or reaching beyond the realm of theory:

> There are important differences between the social imaginary and social theory. I adopt the term imaginary (i) because my focus is on the way ordinary people

> ‘imagine’ their social surroundings, and this is often not expressed in theoretical terms, but is carried in images, stories, and legends. It is also the case that (ii) theory is often the possession of a small minority, whereas what is interesting in the social imaginary is that it is shared by large groups of people if not the whole society. Which leads to a this difference: (iii) the social imaginary is that common understanding that makes possible common practices and a widely shared sense of legitimacy (Taylor, 2004, p. 23).

From this clarification the reader comes to understand that Taylor is emphatically not concerned with the theorizing of the mundane, but with the mundane itself and the ‘shared sense of legitimacy’ that by virtue of implicit legitimacy *gives rise to the mundane*—the characteristics of noise that allow the production of a signal, with the very background of cognizing life falling away to yield a traditional figure/ground dialectic. That is, his social imaginary is the stuff of mundane functionality, of the ephemeral and simultaneous, the synchronousness and synchronicity of separate and separable subjectivities functioning in time under a set of shared, but non-explicit assumptions: an archive distilled into an historical *a priori*. It is no stretch of the imagination to understand these assumptions as archival characteristics: as discourses. The imaginary is the set of implicit expectations that one has about the world so as to derive legitimacy from participating in the world; it is the very essence of the mundane, where the mundane is the phenotypical expression of the discursive constellations that comprise a contemporary archive, an historical *a priori*.

But in attempting to explicate the hyper-theoretical nature of Taylor’s social imaginary, I have taken the discussion into the realm of the almost purely theoretical. What follows is an attempt to remedy this unfortunate, but necessary, foible.

IoT relates directly to the notion of the social imaginary in two ways. First, IoT can be interpreted as a social imaginary unto itself. It constitutes a forward moving impetus for designing and building the technology that will populate our futures. Not only does the construction of a

widespread network of sensor-imbued devices rely on the normative assumptions of a large faction of the society it is intended to impact, but it also, in and of itself, constitutes a projected social imaginary. By that, I mean that IoT—the rhetoric of advertisements that call consumers to buy 'smart' devices and the reams of digital scholarship concerned with communication protocols and wiring and usability studies—is as much a part of a contemporary, present-tense social imaginary as it is a future imaginary unto itself characterized by its own set of (potential) normative assumptions, its own 'background' or *lebenswelt*. In directing itself to the future, or perhaps residing in such a future, the rhetoric of IoT constitutes a sort of trajectory that validates (or, in the words of Taylor, legitimizes) the contemporary actions that give rise to it—but further, it also legitimizes the historical actions that have occurred so as to allow for the ubiquity of Internet-enabled living.

IoT, then, is secondly a possible social imaginary. That is, it is a potential set of expectations about what it will mean to live in the cultural-historical milieu that the implementation of IoT will create. Bridging the gap between the construction of IoT as part of the contemporary social imaginary—wherein the creation of such a massive network of sensor-imbued devices presents as a perfectly normal and legitimate practice—is a treacherous endeavor. It is treacherous because it is too tempting to fall into reductionist tendencies, to destroy future potentials by way of prognostication: as in, 'It *will* be that way and therefore not any other.' What is needed to approach the future social imaginary of IoT without destroying it—or causing more damage than is necessary for the purpose of discussion—is a philosophy of the archive wherein multiple simultaneous statements can be valid even if they are contradictory. Put differently, the goal will not be to predict the future of IoT, but rather to identify the set of discursive elements that, within the greater archive beyond the historical *a priori*, are configurable into a future historical *a priori*.

Just as IoT implies a change in the constellation of subjects and objects that comprise 'things'—as I will argue in-depth later—it also changes the validity of single-viewed critique. IoT, then, is as a Latourean matter of concern (see Chapter Three), as is the social imaginary of it: IoT is a space of potential discursive constellation and re-constellation, an archive that comfortably contains its own contradictions.

Chapter Three: Methods

3.1 A Methodological Note

This chapter provides an overview of, and justification for, the author's methodological choices. As described in previous chapters, the goal of this work is to answer the question, 'What latent or emergent meanings might arise from the statement, 'I am human,' in a future characterized by ubiquitous IoT?' In order to answer this question, three smaller questions must first be answered. First, 'What are the discourses active in the construction and maintenance of the imaginary of IoT?' Second and third, 'Is it possible to identify the mechanisms responsible for discursive transformation, and if so, what are they?' In what follows, I outline the methods I will use to achieve these goals.

Just as each of these questions about IoT is fundamentally grounded in the phenomenology of sociotechnical-being—and therefore the *experience* of living in a rapidly changing sociotechnical milieu—so, too, must the explanation of my choice of methodology be. I begin, then, with some personal-professional background—if, as I argued in Chapter Two *vis-à-vis* Heidegger, the study of 'things' in IoT cannot and should not be approached in a purely scientific, reductive manner, then I must account for my own subjectivity in the interpretive and qualitative work that follows. In order to so do, I begin this section with a quote from the Sherlock Holmes stories:

> "He was not studying medicine. […] Neither did he appear to have pursued any course of reading which might fit him for a degree in science or any other recognized portal which would give him an entrance into the learned world. [….] Desultory readers are seldom remarkable for the exactness of their learning. No man burdens his mind with small matters unless he has some very good reason for doing so.
>
> His ignorance was as remarkable as his knowledge. Of contemporary literature, philosophy and politics he appeared to know next to nothing. Upon my quoting Thomas Carlyle, he inquired in the naivest way who he might be and what he had done. My surprise reached a climax, however, when I found incidentally that he was ignorant of the Copernican Theory and of the composition of the Solar System."
>
> -Dr. John Watson (Doyle, 2013, p.12)

As a result of generous funding and guidance from those parties mentioned in the acknowledgement section of this dissertation, I have spent the last seven years involved in various interdisciplinary peregrinations under the aegis of my committee and the Department of Informatics at University of California, Irvine. As in the quote from the fictional Dr. Watson above, these peregrinations are most accurately summarized as long periods of desultory reading. That's not to say that these periods of reading were characterized by disinterest, but rather by a purposeful breadth: a breadth so wide that from an outside observer, they may have appeared unfocused. What began with a focus on breadth over depth slowly evolved into aspirations of broad depth and the development of a suite of interdisciplinary questions—the aspirations of a generalist, I suppose.

A sub-chapter entitled 'A Methodological Note' may seem an odd place to include biographical information of any kind—methodology for many excluding perhaps enthographers and those belonging to the broader ethnomethodology camp, after all, is the systematic removal of the researcher's biographical and cognitive prejudices, the distancing of the personal from a person's object of study. It is only through the presentation of these biographical facts that I can begin to adequately address the methodological approach I have adopted for the present research. My choice of methods mirrors the means by which I arrived at IoT as an object of study.

The Internet of Things should not be approached with aspirations of methodological, reductionist sterility. What good would concern with validity do when the object of study—the domain—is as yet unconcretized? Exercises in increasing external validity would surely exert concretizing power over the topic in question. Validity, in other words, would be constructed from the laboratory out. The sterility of more traditional empirical approaches often, if not always, gives way to binary outcomes—yeses or noes, too-close statements of 'it is' or 'it is not.' Such binaries

give way, somewhat paradoxically, to endless critique: each binary can be approached from myriad vantages, each one picking at a minute aspect of the binary.

With the sterility of laboratory conditions and control often comes the acute lack of external validity even when eternal validity is rigorously sought; when the object of study is so broad as to be accurately referenced by the signifier 'things,' then the myopia of laboratory reliability becomes the enemy of understanding. It risks forcing 'things,' an amorphous peg, into a square hole. It could indeed be made to fit into a square hole, but it could just as easily fit into others, too.

The Internet of Things is not 'this' or 'that,' but emphatically both; always already what Bruno Latour has referred to as a matter of concern (Latour, 2004). It is under development; its development heralds the potential arrival of a new historical *a priori* condition in which the discourse of 'the human' and 'the thing,' intertwined as they are, will be forever transformed; a new historical a priori condition that, itself, evidences a fundamentally new structure of the archive. As such, any methodological approach to the study of IoT must be one that can accommodate contradictions: situations where *this and that*, *it is and it isn't* can coexist.

So, the goal here is to begin to understand the Internet of Things in its rich and wild and nascent state, not as a purely technical phenomenon as in the case of the definitional literatures reviewed in Chapter Two, but as a sociotechnical set of phenomena reaching like dendrites across multiple scales of society (e.g., from the city, to the home, to the body), and, indeed, into multiple potential futures. It is emphatically not the goal of this work to prematurely reduce IoT to *x* or *y* (or even *x*, *y*, *and z*), but rather to provide a rich and critical description of the various constellations that form in the greater set of discourses that subtend IoT—a set of discourses that limns the historical *a priori* from which IoT emerged.

In analyzing those traces of IoT that have passed my way—by newsfeed, by email, by conference, by reading, or by explicit searching and data collection—I might be tempted to characterize this 'sample' of data as a convenience sample.[91] After all, sitting at my computer, the digital traces of the world pass by me as people past survey-taker at the bottom of a shopping mall escalator. But this cannot be the case because I am not interested in generalizability in a traditional sense. The goal is not to produce findings that can and should be replicated across time, but rather to produce findings from which a theory might be born: a theory of the relationship between things and humans in the imaginary of IoT and the role of that relationship in the mechanics of discursive transformation.

The data collected and analyzed here is not a 'sample' *per se* because it does not pretend at statistically sound representation of the entire popular of objects and phenomena in IoT—if such an operationalization of IoT objects and phenomena were even possible. Instead, I am generalizing backwards, downwards to those concepts that might reside below the surface of the imaginary of the Internet of Things—generalizing downwards to discourses—'the human' and 'the thing'—to themes, to constellations of characteristics that arise between subjects and objects when those subjects are human and those objects are 'smart.' Rather than attempting to define the population of IoT objects and phenomena in order to generalize about them, I identify and define discourses that subtend this finite but innumerable set of objects and phenomena in order to more adequately understand and represent the possible futures—the shapes of the IoT imaginary—that are extant in them.

[91] The temptation to formalize by way of extant terminology is always present, particularly when one's introduction to scholarship occurred through the lens of experimental psychology.

3.2 Grounding in History

As precedent, I turn to the Annales School of historiography that arose in France in the 20th century.[92] For the founders of the loosely organized group of scholars, Febvre and Bloc, the study of history was not adequately undertaken if undertaken at the topical, event-based level. Rather, the production of historical knowledge was to be sought in temporalities longer than those generally considered by historians working in the empirical tradition of Ranke. From this approach we arrive at Braudel's notion of the *longue durée*—history at the level of epochs, greater than the scope of one human life, greater than the century or the empire.

If history can and should be approached from the perspective of the *longue durée* in hopes of attaining a purer or deeper history of historical *a priori* conditions—a history of archival states—then it becomes possible to imagine arguing for the inverse approach. If events in time occur within a greater context of history—a history at the scope of the geological, the epochal, perhaps even the infrastructural—then it could be argued that any event occurring in a present tense bears traces of the *longue durée* to which it belongs. If the immediate past leads up to the present, so, too, must the past of the long term. If the past of the long term leads to a present tense, then the present tense must also lead, in the opposite conceptual direction, back to the *longue durée*. An example will help illustrate.

Let's assume that the rise of the Internet of Things belongs to a *longue durée* concerning the relationship between human perception, action, cognition, and objects in the environment. That is, let us assume that IoT belongs to the long history of the human archive—its production, maintenance and transformations. When, just now, I tap and click at my iPhone to initiate the

[92] If I am concerned with the imaginary of IoT—the lateral present tenses or futures resident in IoT objects and phenomena—then it is no large stretch of the mind to link my project with the production of historical knowledge. IoT as a sociotechnical set of phenomena exists *in* and *of* time.

synchronization process with my FitBit Alta HR. An Annales School approach might rightly concentrate on the forward motion of the long term past into the present tense: the physiological roots of the 'tap/clip' gesture; the anthropology of tool-use; the gradual off-loading of cognitive functions onto memory-prosthetic substrates that began in the Levant some millennia ago and progressed to this very moment in Long Beach, California; the translation of certain ores and elements into standing reserve such that we might all benefit from incredibly tiny processors; etc., etc.. Such an approach would constitute an explanation: the construction of a narrative thread from long-term-past to the moment of the event in question, thus imbuing the now-standard *click/tap* gesture with a richer historicity than might be achieved through a more traditional approach to the construction of historical knowledge.

If this is the case, then the possibility of the reciprocal being true must be considered: any event in a present tense must contain within it certain characteristics—possibilities or potentials—that have bearing on future histories. If the *longue durée* factors listed above (e.g., the anthropological, the physiological, the geological) give rise to and contextualize the click/tap gesture in terms of the long sweep of forward-moving time, then the click/tap gesture in the present tense must carry within it traces of forward motion. Within this gesture, so fundamental to the sociotechnical ecology of IoT, there must reside proto-traces of future-historical trajectories in the form of an imaginary comprised of discursive constellations.

I am not arguing for some kind of divination or fortune telling. But I *am* arguing for a type of forecasting. The media theorist and phenomenologist-historiographer Vilém Flusser has noted that: "Forecasting is not a matter of seeing what's coming. A forecaster looks in the direction in which the present seems to be pointing, at how things will come out, not at what is coming. One can predict outcomes but not what is to come" (2011, p. 156).

In the form of forecasting for which I am arguing, the forecaster does not look in the 'direction in which the present seems to be pointing,' but rather in the direction in which the present points to itself, and in pointing to itself resonates with the echoes of its past; and in the bidirectional feedback loop between the present and the forecaster, which, itself, filters the resonances in question. Flusser went on to posit that:

> A forecaster covers up the future with outcomes so that there is no future. [S/he] anticipates the future with information to avert the future. The Heideggerian concept of 'precaution' expresses it. To take a precaution is not only to concern oneself with a particular possibility but also to provide for this possibility, to draw it into the present, anticipate it, and do away with it. All prediction damages the future (2011, p. 156).

This is where I break with Flusser regarding forecasting. The author speaks of damage as though it is avoidable, as though a perfect, metaphysically virgin future exists. For an author so steeped in the phenomenological method, this is appalling. Any future that is imagined—referenced or acknowledged in the form of language as a possibility—is always already a future of damage. (This is not dissimilar to the notion of archival violence described by Derrida [1998].) Such, I would argue, is the nature of a mind that is capable of inventing the concept of the past and projecting it into a future; a mind that extends the present tense bidirectionally into events and possibilities, and laterally into the realm of the imaginary. We are human; the future is always one of damage.

The damage of forecasting is not to be avoided, but to be expected and embraced. The damage done by the forecaster, however, must be an ethical one, a humanistic one, an equally social and technical one. To avoid the potential benefits of forecasting inward into the present because of a fear for the integrity of the future is to give up the game, to concede, or to simply deny that the game exists. We would march on blindly into a future as though we were indifferent to its

characteristics. Although such an approach is potentially beneficial for the state of philosophical discourse, it does no good beyond that.

In arguing for an inward forecasting, a forecasting of the potentials in subject-object relationships, I am arguing for an analysis of the actionable potentials that reside in subject-object relationships at a given time and from multiple different vantages—for example, those of the city, the home, and the body. If these actionable potentials can be identified through a logical and definable process, then it becomes possible to situate an event not only in the *longue durée* that resides in its (and our) past, but also in terms of the *longue durée* that recedes from it into future present tenses—into the imaginaries that exist between the object and the subjectivity that interacts with it.

With regard to media formats or specific technologies, identification of the actionable potentials is notoriously difficult. Marshall McLuhan described this difficult in an interview with Playboy in 1969:

> […] all media, from the phonetic alphabet to the computer, are extensions of man [*sic*] that cause deep and lasting changes in him and transform his environment. Such an extension is an intensification, an amplification of an organ, sense or function, and whenever it takes place, the central nervous system appears to institute a self-protective numbing of the affected area, insulating and anesthetizing it from conscious awareness of what's happening to it. It's a process rather like that which occurs to the body under shock or stress conditions, or to the mind in line with the Freudian concept of repression. I call this peculiar form of self-hypnosis Narcissus narcosis, a syndrome whereby man remains as unaware of the psychic and social effects of his new technology as a fish of the water it swims in. As a result, precisely at the point where a new media-induced environment becomes all pervasive and transmogrifies our sensory balance, it also becomes invisible. (McLuhan, 1969, p. 54)[93]

[93] McLuhan's approach to media extensions can be interpreted as a humanistic one. In referring to media as extensions, he implies a dichotomy between the human and their technologies: the extensions as an extension of the human will. From a certain vantage, this appears to be antithetical to the techno-determinism that has, since Marx, come to dominate the study of the sociotechnical. However, I think this characterization is hasty. Techno-determinism is a humanistic trait: it is simply a negative one. (Just as bipolar disorder is a negative human trait.) If one reconsiders the foundation of humanism—the study of positive aspects of human culture, society, and history—to include a more holistic and less biased view of the human, then the very anti-agentic role that the human plays in techno-deterministic futures becomes a symptom of a jaundiced human: a human that is inherently jaundiced. The human exercises their

To approach this invisibility not only in the present tense, I contend that the focus must be on discourse and therefore on the history of concepts, intellectual history as it unfolds from the past to the present and as it alludes to sets of potential future characteristics, future historical *a priori* conditions; to approach such instability as it reaches into a future or set of futures, I contend that we cannot rely on modes of logic as unforgiving as induction or deduction, damaging as their binary results are.

It becomes necessary, instead, to turn to a third form of logic: abduction. But abduction, if it does not occur in relation to scientifically collected data and their results, must occur in relation to something else. This 'something else' comes close to phenomenological data: data pertaining to the experience of that which appears. Although they are fairly well established in the realm of media studies, phenomenological methods have a precarious position with technological fields.

3.3 General Overview of Methods

In order to gain access to the discourses that are implicated in the archive of IoT, I will engage in distant reading of contemporary archival traces: microblog content on the Twitter platform that is user-indexed with hashtags relating to IoT. Through analysis of the topics derived from this distant reading, I will engage in a critical discourse analysis in order to understand and tease out

agency to create media extensions; until the advent of machine learning (which bears a functional similarity to early notions of AI), media extensions could be seen as extensions of the embodied human; in the present tense, however, these extensions take on the form of prostheses: of artificial extensions that give rise to wholly new modes of knowledge production, new modes of being. These new modes, however, are as rooted in the humanism of McLuhan's media extensions as any anthropology of positive psychology. It is simply that the dichotomy of humanism and posthumanism is no longer sufficient to describe the historical trajectory of the relationship between the human and the thing. When things begin to think—or to demonstrate 'thinking' in a functionalist way—we must develop a third option to complement the human and the posthuman: we must define the human within the posthuman; we must identify the humanism within techno-determinism.

the relationships between these topics. From this point, I will leverage phenomenological writing and what I refer to as translational distanciation in order to assess the semantic-usability of these topics: that is, to engage not only with concepts represented by various media included in the discourse-topics identified through distant reading, but to begin to construct a set of interactions. These interactions comprise the discursive elements that may undergo transformation in the (future) human archive of IoT. Such translational distanciation will occur relative to various media representations of IoT, including films, emails, landing pages, diagrams, and IoT-enabled objects themselves. Through this process of translational distanciation, I re-ground the 'objects' of IoT in the broader category of 'things,' which (as described in Chapter Two) must always exist in relation to a given subject. Finally, though a process of speculative deduction, I forecast the ways in which the inseparable discourses of 'the human' and 'the thing' may transform to yield a new historical *a priori*.

3.3.1 IoT as Transdisciplinary Matter of Concern

I have already done some little explication of my tendency towards phenomenological approaches earlier in this dissertation. In this section, I provide a defense of my reliance on phenomenology based on a close reading of one of phenomenology's most vocal critics working in the realm of the sociotechnical: Bruno Latour.

From a purely disciplinary point of view, the imaginary of IoT presents as an artifactually rich mantle-bearer for extant, but evolving, areas of science and technology: artificial intelligence (AI), ubiquitous computing, pervasive computing, CSCW, and HCI, to name a few.[94] Just as it has been

[94] IoT is also a domain of practice and production vied for by several of the largest players in the technology industry.

argued that we as humans are staring into a future characterized by an immanent technological singularity, the Internet age is fast approaching a point when each of the disciplines listed above will blend and intermingle to an extent not previously seen.

Such a synthesis of overlapping fields is inherent in the broad reach of the term 'things.' As such, approaching IoT in the form of dissertation research is necessarily an exercise in delicate reductionism—it is simply not feasible to attempt a wholistic analysis of IoT that addresses it from the singular vantage of each domain listed above. That would be the work of multiple careers. Instead, a more productive and manageable approach is to borrow from each of these fields—to identify the points at which each of these disciplinary sets overlap. Although I will borrow (in)directly from each of these fields, it is HCI that takes center stage here; however, I use the term HCI rather loosely, even begrudgingly. That is, instead of presenting research grounded in the empirical and laboratory practices of experimental psychology, I focus on the discursive and phenomenological aspects of interaction which necessarily requires a broadening of the definition of a 'user.' Put differently, I focus here on the relationships that constitute 'things'—on things as what Bruno Latour (2004) has referred to as 'matters of concern.'

I argue that it is necessary to first understand the meanings of 'internet of things'—the denotations, connotations, resonances, and boundaries. (As demonstrated in the critical literature review that comprised Chapter Two, this in and of itself would constitute a novel contribution to the IoT literature.) Each of the phrase's constituent terms is problematic. Things are innumerable; the Internet is vast. Even the lowly 'of' implies a hierarchical taxonomy or ontology in which one thing belongs to another—an ontology that seeks to change its own structure by means of an objective self-awareness. It orders what cannot presently be ordered according to a standard

Each player (e.g., Intel, Microsoft, Amazon, etc.) brands IoT is slightly different ways, which creates a branched taxonomy of IoTs.

ontological stance because the very nature of the order is changing: the phrase 'Internet of Things' is the signifier of a change, of something new.

Failure to address the broad theoretical implications of these combined terms (Internet, of, and Things) is relatively well described in the literature (Bunz, 2016). When describing IoT, it is generally easier to approach one small aspect of the imaginary ecology and proceed from there, engaging in descriptions of communication protocols, hardware, or vulnerabilities relative to one of the eponymous 'things.' But the goal of this dissertation is something else entirely—engineers, coders more proficient than I, and security experts are better suited to describe and analyze these intricacies by way of close case studies. Instead, my goal is found at the simultaneously higher and lower level of abstraction of 'things.' As to the lower abstraction, and with feet on the ground of the experiential and embodied world, 'things' occur at the point at which noumenon and phenomenon meet—the point at which the craftsman wields her tools, the *flaneur* his feet upon the streets, and the recluse the maintenance of their self-imposed isolation. From this phenomenological vantage, 'things' are mundane. They are the streets upon which we walk, our coffee cups, our cars, speakers, pens, laptops. They *are* only in the ephemerality of our interactions with, remembrances of, or mental maps about them, as likely forgotten or overlooked as well-maintained infrastructure.

From a higher theoretical level of abstraction, though, 'things' comprise a profoundly heterogeneous set of referents that attach and detach from a given signifier, demonstrating similarity only in the possibility of attachment with a subject. Here, 'things' comprise a theoretical set of subject-object connections at the very core of the modes in which we, as subjectivities, make sense of the world. My interest in IoT, then, is an interest in the changing connections between subjects and objects that occur as a result of 'Internet' modifying 'things.'

It is specifically not my intention to take a purely disciplinary approach and claim that IoT belongs on the Humanities' side of campus, or the Engineering side of campus, or the Arts side of campus. Instead, I argue that it resides simultaneously in each and must be analyzed accordingly. Few methodologies for doing so appeal as much as that prescribed by the practitioners of actor-network theory. Specifically, the 'matter of concern' approach first described by Bruno Latour. So, in approaching a methods section, I'll begin there—however, as we shall see, this approach is not readily applied in-whole. That is, it is not without its problems and logical weaknesses that will need to be addressed.

3.3.2 A Critique of Latour's Critique of Critique

Bruno Latour has devoted a substantial amount of writing to the concept of 'things.' Much of this writing is valuable as background for the present project. However, much of it is valuable precisely because it provides a background against which the figure of my research can rebel:

> […] things have become Things again, objects have reentered the arena, the Thing, in which they have to be gathered first in order to exist later as what *stands apart*. The parenthesis that we can call the modern parenthesis during which we had, on the one hand, a world of objects, *Gegenstand*, out there, unconcerned by any sort of parliament, forum, agora, congress, court, and, on the other, a whole set of forums, meeting places, town halls where people debated, has come to a close. What the etymology of the *thing—chose, causa, res, aitia*—had conserved for us mysteriously as a sort of fabulous and mythical past has now become, for all to see, our most ordinary present. Things are gathered again (Latour, 2004, p. 236).

At first, and based on this excerpt, Latour and I are in agreement about the (at least) dyadic composition of things: they are a gathering. In approaching IoT through the lens of the archive

(and therefore history and historiography), it is clearly possible to treat 'things' as a gathering – things that add up to a Thing.

Moreover, it is possible to view the Thing as a gathering-in-progress, a multi-faceted debate between discursive elements that transforms across time to yield a set of possible futures, possible future historical *a priori* conditions, or epochs. But in Latour's quote above, things and Things exist in a present tense, different from that of the near past, but cyclical and similar to that of a distant past: "What the etymology of the *thing* […] had conserved for us mysteriously as a sort of fabulous and mythical past has now become […] our most ordinary present. Things are gathered again." My own desire to trouble the near-future, then, appears as the first point at which some reconciliation is necessary. To further clarify, I will return to the question that drives this dissertation: "What might it mean be 'a human' within and alongside the Internet of Things?"

Such a question is grounded in the conditional, itself necessarily lateral or otherwise distal to the present tense: "what might?" It is an introverted question that looks self-consciously to a mirrored navel in order to project a set of anxious possible outcomes. Rather than projecting *explicit* outcomes, it looks to project the characteristics of outcomes – discursive silhouettes. In looking inward towards the plentiful, archival texts of IoT (i.e., professional and scholarly research output, marketing materials, suppositions, industrial enticements, Tweets, presentation materials) the question presumes that something of the future lurks within the current discursive constellation of IoT. Just as the things of a distant past have come to be gathered again, thus signaling that something of the past's future resided therein, my own question presumes a similar circularity. The Thing that is IoT will be the Arkheion wherein the future exists as potential concern (or set of potential concerns), as yet unreduced to factuality; that, like a set of elements subjected to

topological transformation, the discursive elements that define it might be reconfigured into an apparently different structure while retaining their ultimate value.

Latour has argued that, under conditions wherein the 'thing' has become the 'Thing' again, or where such an ontological transformation threatens the old guard with reification, a deeper realism must be embraced within the production of (scientific) knowledge.[95] Indeed, according to Latour, the 'Thinging' of the thing begs the abandonment of the reductionism inherent in scientific realism as represented by the lofty conceptual status of the 'matter of fact.' But this is an unfortunately difficult position to argue – not necessarily because of convoluted logic, or uniquely nuanced conceptual relationships, but rather because of the language available for explication. In attempting to describe this other state, a state of knowledge production that might supplant or supersede reductionist realism, Latour is in fact attempting to describe an ontological position so fundamental as to be always already drowned in the centuries of water carried by the language of science—and, perhaps more importantly, the *inscribed* language of science. To appropriately elucidate this point, it is necessary to reproduce here some of Latour's arguments at length:

> Quote A: "To retrieve a realist attitude, it is not enough to dismantle critical weapons so uncritically built up by our predecessors as we would obsolete but still dangerous atomic silos. [… T]he difficulty lies in the fact that they are built on top of a much older philosophy, so that whenever we try to replace matters of fact by matters of concern, we seem to lose something along the way. It is like trying to fill the mythical Danaid's barrel—no matter what we put in it, the level of realism never increases" (Latour, 2004, p. 243).

Here the reader encounters Latour's oblique reference to the obfuscated position of the form of realism he seeks. If it existed at any point, it is now buried beneath subsequent structural

[95] It is with reluctance that I include the potential modifier, 'scientific,' here because its inclusion seems likely to allude to the very impoverished and historically entrenched version of science that has been practiced since the invention of the 'matter of fact' during the Enlightenment.

improvements: one would have to engage in massive archaeology, the dismantling of buttresses, the destruction of glass and Altars to approach the fundament of the cathedral. (Even so, such an archaeology could ultimately be seen as a reductionist endeavor.) There is a religious wistfulness to Latour's writing, a Sisyphean sense of overexertion—exasperation—found in the term 'retrieve.'[96]

What would it mean to retrieve a truer realism subsequent to the factual realism that has reached from the Enlightenment to the present via the long and lasting arms of mediation? In what optimism is present in this notion (and it is most certainly present, as Latour characterizes such a retrieval as 'difficult' rather than impossible) one finds a theoretical blind spot: any return to realism, or even the discovery of some greater realism, must by its own temporal position relative to reductionist realism come as a result of such reductionism. In such a way, Latour seems to place a faith best likened to religious faith in the restorative (if not redemptive) qualities of such a retrieval. But such faith must be misplaced: only in the presence of reductionist realism does the prospect of a truer, richer realism come into focus.

To put it in Latour's terms, if not for the presence of Danaid's barrel, there would be no water to carry, no reason for the complaint that leads to a non-reductionist realism (matters of concern) as a theoretical solution. In the retrieval of a pre-reductionist, pre-factual realism, one finds no epistemological redemption, but rather a reckoning and re-acquaintance, a constellation of temporally related epistemologies—catastrophes at the foot of the Angel of History (of

[96] If one takes a wide approach to the reading of this term, much of the perceived wistfulness comes as a result of the term's etymological relationship to the Old French *troveres/truveurs,* most commonly referred to in English as troubadours. In such retrieval *(retrouver*, to find again, as in something lost) resounds an echo of the poetics of loss and memory, of singing of what no longer is. Even something found again takes on the characteristics of the period of time during which it was lost. For the scientist, just as for Proust, retrieval is always a misery unto itself.

Science)—which must now sit simultaneously at the same pew. As the theorist continues, process philosophy already holds a prominent position:

> Quote B: "What set Whitehead completely apart and straight on our path is that he considered matters of fact to be a very poor rendering of what is given in experience and something that muddles entirely the question, What is there? with the question, How do we know it? […] Those who now mock his philosophy […] have entirely forgotten what it would require if we were to take this incredible sentence seriously: 'For natural philosophy everything is perceived in nature. We may not pick up and choose. For us the red glow of the sunset would be as much part of nature as are the molecules and electric waves by which men of science would explain the phenomenon' (CN, pp.18-19)"
>
> (Latour, 2004, p. 244)

This is a relatively straightforward passage given any familiarity with Actor-Network Theory. As with scallops for Callon (1986), the starting point of the argument, the begging of the question, occurs at the level of classification: objects or phenomena that fall on either side of the generic natural/social dichotomy are deemed fundamentally different; part of this difference exists in the allocation of agency.

In breaking down the categorical barrier between natural and social, it is logically necessary (it is certainly convenient) to wield agency as a hammer first to execute such a breakage and then to arm all former occupants of either category for the reconstruction of a world rid of the natural/social dichotomy: a world post-modernity, where 'post' designates a return to before—a post-modern that is pre-modern in its rejection of modernity.

This is a quick and dirty summary of an argument close to my own heart, but its architects did not go far enough. Just as the distribution of agency across categories is necessary to break the ontological walls that separate them, with the universal distribution of agency (or something akin

to agency that allows for active and meaningful involvement in the production of knowledge) it is necessary to account for the experience of the agency.

And here we encounter a deeply problematic, and yet beautiful, component of ANT: how does one account for experience across all formerly natural or social categories of actants? One might expect that the answer has something to do with phenomenology. Indeed, it does.

Latour argues that the involvement of phenomenology in the production of knowledge about the world would only serve to further entrench our worldly knowledge in the impoverished objectivism of Enlightenment thinking—to reify once and for all, if not only again, what Whitehead referred to as the bifurcation of nature. He does so, I believe, because of his inability or unwillingness—far be it from me to accuse Latour of inability—to account for the experience of non-human actants. That is, in all the effort undertaken to demolish the boundary between the natural and the social, and therefore the human and the non-human in terms of agency, one gets the distinct impression that the theorist still retains a fundamental dichotomy between object and subject, between thing and person, between classes of actants.

Despite the invocation of Whitehead, it would seem that a bifurcation (perhaps *the* bifurcation at the heart of Whitehead's argument) still exists. To demonstrate, a return again to Latour's writings:

> Quote C: "All subsequent philosophies have done exactly the opposite: they have picked and chosen, and, worse, they have remained content with that limited choice. The solution to this bifurcation is not, as phenomenologists would have it, adding to the boring electric waves the rich lived world of the glowing sun. This would simply make the bifurcation greater. The solution or, rather, the adventure, according to Whitehead, is to dig much further into the realist attitude and to realize that matters of fact are totally implausible, unrealistic, unjustified definitions of what it is to deal with things […]"
>
> (Latour, 2004, p. 244)

In all their richness and fervor, Things begin to fall apart when these quotes are read for internal consistency. Latour's playfully antagonistic nod to the language of phenomenology (e.g., "boring," "rich," "lived," "glowing") betrays a weakness in the argument. The stylistic shift present in this line, rhetorically effective though it is upon first reading, necessarily calls into question his own use of analogies and metaphors in the argument he makes. It also arguably betrays a weakness known to the author—engagement with rhetorical devices for the construction of a logical argument presents as an act of enrolment: rather than presenting the architecture *of* the logical move, Latour presents a rhetorical impetus *for* the move. It is as if he is aware of a weak connection and so presents the appearance of a strong connection with wordplay. In the use of these terms, Latour criticizes the linguistic leanings of phenomenology—the phenomenologist's use of rich language to paint a more nuanced picture of experience. Admittedly, this is part-and-parcel with the practice of phenomenology especially according to its most ardent, contemporary practitioners. The study of 'that which appears' (from the Greek ϕ*αινόμενον or* phainómenon and subsequently the Latin phaenomena all roughly meaning 'thing appearing to view' and *logos*)[97] is heavily reliant on linguistic description:

> "The experience of phenomenological reflection is largely (though not exclusively) an experience of language, and so phenomenological reflection on prereflective life would be much better described in terms of an experience of writing […]." (van Manen, 2014, p. 368)

However, as Latour would likely argue, given the historical context in which phenomenology developed, such linguistic description presents as an add-on, an apology by way

[97] Heidegger describes the etymology as follows: "Hence phenomenology means: to let what shots itself be seen from itself, just as it shows itself from itself. That is the formal meaning of the type of research that calls itself 'phenomenology.'" (Heidegger, Stambaugh, & Schmidt, 2010, p. 32)

of floridity and nuance, to the reductionism of its epistemological antecedents. In this unexpected Derridean light, wherein the positive practice of phenomenological analysis occurs always in the context of its negative space—that of reductionist positivism—the language of the phenomenologist seeps from Danaid's barrel just the same. All is not, however, lost for the phenomenologist.

Latour's implicit critique of the language in Quote C (a moment of inconsistency for Latour wherein he engages in the same form of othering criticism he ultimately denounces) alludes, however gently, to the underlying problem of language in describing the world as it is experienced—the encounters with things that give rise to Things—which seemingly must be close to the deep realism that Latour seeks. It seems that Latour would hold that the language of phenomenology is always already reductionist because it is historically juxtaposed against the epistemic tendencies that preceded it. All this to allow the breakage of the barrier between natural and social.

The origin of speech in the body ties all derivatives to that body and thus grounds any description in bodily experience: the body as medium provides the possibility of speech; all speech, then, is grounded in the experience of embodiment. Indeed, in the act of transforming the spoken to the written reasserts the embodied nature of spoken language. As in Derrida's (1998) discussion of circumcision as a form of archival impression, the inscription of language onto a substrate impresses upon that substrate and subsequent readers a physical metaphor for the origin of the words, for the words' originary embodiment.

In ridiculing, however playfully, the descriptive language of phenomenology, Latour in effect negates his own usage of descriptive language in making his argument. How else does the structural metaphor of 'built on top of a much older philosophy' function than to recollect the

experience of physical space, the city space or a dwelling, in order to provide the reader with a bodily relation to his concepts? Of what good would the analogy of filling Danaid's barrel be without the bodily experience of pouring water—of Heidegger's poured gift of the pouring out? What the reader is left with, then, is an absence of a means of effectively communicating the Thinging, the deeper realism that Latour seeks. At least part of Latour's problem with the vestiges of Enlightenment objectivism lies in the ubiquitous reliance on language.

3.3.3 From Latour to Phenomenology: Phenomenological Writing

The phenomenologist Max van Manen provides language that might be read as exactly in-line with the deep realism Latour seeks. Interestingly, it is grounded exclusively in the act of writing as a phenomenological tool: "Writing creates a unique and separate universe, the space of the text that puts the reality of everyday life out of play. In the experience of writing, words lose their taken-for-granted significations" (van Manen, 2014, p. 368). In this light, the language of the phenomenologist does not appear as an apologetic act of misdirection intended to compensate for the shortcomings of Enlightenment realism. Instead, the language of phenomenology appears as generative rather than reductionist. Isn't it possible that the achievement of a conceptual heterotopia, this 'unique and separate universe' wherein 'the reality of everyday life [is] out of play' might be a condition for the appearance of a deeper realism? Might not an appreciation for the gathering of the Thing, an abandonment of matter-of-factual criticism, manifest in the very generative and expansive conceptual domain offered by phenomenological investigation? It seems that only Latour's predisposition against phenomenology and the linear historical causality with which he imbues his characterization of phenomenology precludes such a possibility. I am not

prepared to submit to such a linearity, seeking rather to allow for a broader form of concern: one that fosters the co-existence of multiple (even conflicting) epistemologies.

What Latour has perhaps failed to recognize (certainly to address) is the relationship between subject and object that constitutes a thing. For Latour, the thing is a gathering: but it is a a gathering that occurs at the grandiose scale of the natural and the social. Although ANT is famous (and infamous) for analyzing the agency of inanimate objects, the objects in their agency take on characteristics of the social. That is, rather than constructing a tertiary category of subject-object hybrids (or chimeras), ANT pulls from the object to place it in the subject. Out of a desire to algebraically balance the categories of natural and social such that the divide is no longer necessary or conceptually productive, he has distributed agency and withdrawn experience. One would still, I think, be able to demolish the dichotomy but retain the experience if one were to invoke a narrowly defined, Gibsonian notion of affordances, thereby demolishing the dichotomy by residing in the interstitial space between subjects and objects where both are equally important in the production of a thing. The problem seems to reside in the concept of experience that underlies the agency of actants. Isn't is possible that the experience granted to the human subject exists in categories of its own? And might not these categories derive from the coupling, however brief or persistent, between human and non-human actants? Between subjects and objects? I believe the answer here is, 'yes.'

In order to truly raise the object-actant to the level of agency ascribed to the subject-actant, it is necessary to account for the phenomenological experience of the inanimate-actant-coupled-with-human-actant; it is necessary to account for the experience of the network, rather than its distribution or description. Unfortunately for Latour, such an account can only be provided via linguistic description—ultimately some kind of translation is necessary in order to communicate

the coupling between subject and object, between actants, in any meaningful way. As such, whereas Latour opted to (apparently) abandon phenomenology in order to unify dichotomous categories, I will opt to embrace it in order to not unify categories, but to identify and reside within the space between them: to acknowledge the emergence of the chimera, the third category. In embracing it, I will straddle the line between linguistic discourse analysis and Foucauldian discourse analysis, working under the hypothesis that the core characteristics of subject-object couplings—of things—comprise discourses.

These categories of animate and inanimate, of subject and object, are discourses unto themselves. That is, they are fundamental discourses upon which, and through which, historical *a priori* conditions are constructed. It is therefore in discourse analysis, tinted with phenomenological inquiry, where we might ultimately gain access to the truer-than-true reality Latour sought.

3.3.4 Discourse Analysis[98]

If things are couplings of subjects and objects (see Chapter Two), and phenomenological writing presents as a valid means of achieving a deep realism (see above), then what remains to be shown is the extent to which phenomenological writing can grant access to discourse. I contend that discourse is always already embedded and embodied in the thing: we experience discourse when we form things. If the archive dictates what can and cannot be said, what statements

[98] A precautionary note: While this section introduces Foucauldian discourse analysis, which overlaps in no insignificant way with the greater Foucauldian concept of the archive, I reserve a full discussion of 'the archive' for Part III of this dissertation. What is presented here is what is required to maintain forward motion for the sake of readability.

(*enoncés*) are possible or impossible, then the materialized artifacts of which the archive is comprised (*enoncés* also include events, and events must always include 'things' if the nature of the 'thing' is a coupling) must also bound what can and cannot be done. What is done and what is said are one and the same.

To clarify just what I mean by 'discourse,' I turn to one of the seminal works on the topic: Michel Foucault's 'Archaeology of Knowledge.' But this work provides only an introduction, as I intend to pick up where Foucault left off. That is, as I have stated earlier, the goal of this dissertation is not simply to identify the discourses that subtend the imaginary of IoT, but to abduce the transformations they will undergo as IoT—the real-world, sensor-imbued network of objects—is realized. To abduce such transformations is to identify mechanisms by which such transformations occur.

An early description of discourse is framed by the notion of 'uniformity':

> Before approaching, with any degree of certainty, a science, or novels, or political speeches, or the oeuvre of an author, or even a single book, the material with which one is dealing is, in its raw, natural state, a population of events in the space of discourse in general. One is led therefore to the project of a pure description of discursive events as the horizon for the search for the unities that form within it. (Foucault, 1982, p. 27)

This is exactly the sort of tricky statement one expects from Foucault. (One wonders whether or not his writing would make it past contemporary reviewers.) But it is worth unpacking. In creating a set of objects of study including 'a science, or novels, or political speeches, or the oeuvre of an author,' it is clear that Foucault is not directly interested in the objects themselves—the acts of speech, or the physicality of the books and instruments, measurements and notes that make up a science or 'the novel'—but rather the historical and linguistic categories to which these objects

belong. (It is tempting at this point to argue that each of these categories is derived from the historically constructed means by which users—that is, subject-recipients—of these objects can interact with them, but such an argument is best left for the final section of this dissertation. I ask, however, that you bear this in mind.) But that is not accurate enough: Foucault is interested in the very sinews that bind these concepts together in their own categories, that allow for the existence and indexicality of such concepts as 'the novel.'

In approaching the sinews, preparing a sort of anatomical and physiological assessment of cultural-historical events, he is most clearly a structuralist. That is, in seeking to identify and tease apart the uniformities underlying each of these broad categories of cultural-historical events, Foucault is assuming the existence of some elemental set of characteristics that underlie each of them. Our initial interpretation of 'discourse.' then, is that it is comprised of these heretofore unidentified elements. Further reading from a proximal passage will sharpen our interpretation:

> […] a language (langue) is still a system for possible statements, a finite body of rules that authorizes an infinite number of performances. The field of discursive events, on the other hand, is a grouping that is always finite and limited at any moment to the linguistic sequences that have been formulated; they may be innumerable, they may, in sheer size, exceed the capacities of recording, memory, or reading: nevertheless they form a finite grouping. The question posed by language analysis of some discursive fact or other is always: according to what rules has a particular statement been made, and consequently according to what rules could other similar statements be made? The description of events of discourse poses a quite different question: how is it that one particular statement appeared rather than another? (Foucault, 1982, p.27)

In this continuation of his treatment of discourses, Foucault's inclusion of 'finite and limited' draws the most attention. He seems to be invoking the notion of a set, which is part-and-parcel with his structuralist views. That is, first there appears a set of statements and events, the contents of which can be configured, constellated, or combined in functionally innumerable ways into

discourses, but ways that have a logical finitude. Second, these potential sets of discourse coalesce and coagulate into larger constellations of what is possible and what is not: in short, they concretize—although ultimately with limited durability—to form historical *a priori* conditions: the manifestation of the archive into which a given generation of humans is born.

In his notion of discourse, then, Foucault is referring essentially to potential discursive constellations, or, more clearly, potential cultural-historical milieus. The question, 'how is it that one particular statement appeared rather than another?' readily translates to a broader question of how one world, one set of rules governing an individual's experience within the human archive, arose through a process that must resemble topological transformation, over another?

This is precisely the question I seek here to answer, but projected forward into the imaginary and proximal futures of IoT: how is it that one future of IoT might arise as opposed to another? (One might rephrase as: Where and when is here? And how did we get here?) If IoT is adequately defined as a social imaginary—and I think it is—then we must question the mechanisms of discursive transformation that will impact the constellation and re-constellation of the discursive elements that subtend such an imaginary. In seeking abductive answers to this question, in addressing the transformations, the pre-formations of what Foucault later refers to as the historical *a priori*, I seek the identification (in theoretical or empirical terms) of the mechanisms responsible for such transformation.

As is necessarily the case when dealing in ideas of system builders like Foucault, the explication of one term (e.g., discourse) requires the explication of another. In this case: the historical *a priori*. Generally speaking—and to anyone with a background in even the softest of sciences—*a priori* will resound with questions and concerns for validity. But for Foucault, and for me, this is not what is meant. Instead, what Foucault means:

> by the term is an *a priori* that is not a condition of validity of judgments, but a condition of reality for statements. It is not a question of rediscovering what might legitimize an assertion, but of freeing the conditions of emergence of statements, the law of their coexistence with others, the specific form of their mode of being, the principles according to which they survive, become transformed, and disappear. An *a priori* not of truths that might never be said, or really given to experience; but the *a priori* of a history that is given, since it is that of things actually said. (Foucault, 1982, p. 127)

Put differently, this is not a question of validity, but a question of experiential reality. The term 'given' is best representative of this distinction. The historical *a priori* constitutes the 'given' or received quality of the reality in which an individual lives. In my own case, having been born in the early 1980s, this *a priori* is largely defined by the breakneck race of technology, the rise of big data, the disciplinary-colonial tendencies of computerized empiricism across all domains of the lived world. (Somewhere in there must be included Saturday Morning Cartoons, the Simpsons, Seinfeld, the Clinton, Bush, Obama, and Trump administrations, etc.) However, it would not do to leave the discussion of the historical *a priori* here, where it seems too close to fate, too close to the fundamental removal of agency from the individual. (That said, there is a distinct overlap between the Foucauldian notion of an historical *a priori* and the Heideggerian concept of 'thrownness:' we are, through birth, thrown into an historical *a priori* comprised of explicit or implicit rules, each of which is tied up in the long history of the archive as it undergoes topological transformation by means of discursive transformation, one set revealing itself as not exclusive, but rather a member of a larger superset, etc.)

Foucault continues:

> [The *a priori*] has to take account of the fact that discourse has not only a meaning or a truth, but a history, and a specific history that does not refer it back to the laws of an alien development. [….] Moreover, this *a priori* does not elude historicity: it

> does not constitute, alone events, and in an unmoving heaven, an atemporal structure; it is defined as the group of rules that characterize a discursive practice: but these rules are not imposed from outside on the elements that they relate together; they are caught up in the very things that they connect; and if they are not modified with the least of them, they modify them, and are transformed with them into certain decisive thresholds. The *a priori* of positivities is not ht only system of a temporal dispersion; it is itself a transformable group. (Foucault, 1982, p.127)

But here, in the presentation of the term 'transformable,' is one instance in which my approach differs fundamentally from Foucault.

Foucault's project was one of historical trajectories, of continuity and (more importantly) discontinuity. He sought out discontinuities, points of breakage between one epoch and another—each of which can be described and therefore defined by discourses. For Foucault, discursive transformation, if it approaches the point of what in psychology would be called the 'just noticeable difference', leads to a breakage: this breakage, or discontinuity, signals the shift from one historical *a priori* to another. It is therefore the process of discursive transformation that allows for the identification of a new era, a new epoch.

His was a project that unfolds at the level of the societal, the governmental. It is a project of institutions and power. As an example, consider Foucault's work on the birth of statistics and its relation to the state. Without the collection of descriptive data about a population, the modern 'state' could not exist. In this instance, it is the ability to collect data—and by ability I mean not a mode of inscription, but rather the ability to collect data in a way that jibes with social expectations, of the shared modus operandi for being within a given society—that signals a discursive change. It just so happens that such a discursive transformation bore enough influence over the structure of the archive that it heralded a new era: that of the state. And why wouldn't it? The Foucauldian archive has many points of overlap with the traditional notion of archives. Archives, one might say, are the physical instantiation of one facet of *the archive*. Archives hold the documental identity

of an institution, a government, a corporation, a people. As such, archives become the primary perceived point of interaction with the archive.

My interest takes me in a different direction entirely, one that focuses not on the wide-swing effects of cultural-historical milieus, of historical *a prioris*, but on the individual experience of life within such an historical *a priori:* what it will mean to be a human at the temporal level of the mundane within an historical *a priori* condition largely defined by the realization and ubiquity of that category of 'things' to which IoT gives reference. That is, I am interested not in the wide formation of the historical *a priori*—although this will certainly be touched upon—but in the experience of life within such an *a priori* condition. Where Foucault sought to construct, via his own inimitable style of discourse analysis, a top-down understanding of the historical *a priori*, I seek to understand its formation from the bottom up: not settling to focus on a received set of discursive constellations dictating what can and cannot be done or said in a given life, but rather to approach such an historical *a priori* condition—comprised always already of discourses—as a malleable set of discourses—potential constellations—to which an individual has access in the course of their mundane, daily living. In their malleability resides the possibility for not only discursive change writ large, but also the possibility for entrapment, for the caging of the human with the invisible bars of extant infrastructure.

I posit that discursive transformation occurs, in part, through the cumulative effects of bottom-up actions: through the design, proliferation, and adoption of hopeful monsters, of platforms, interfaces, and information metaphors. In short, I posit that the media formats used in the construction of infrastructure, its adoption and adaptation by individual users, is the very site of discursive transformation, which from Foucault's chosen vantage, could only be identified and described after-the-fact. (Real-time analysis, if it exists today, certainly did not exist for Foucault—

even in the last years of his life when emails began to zip past our bodies, into our disembodied inboxes.) It is for this reason that so much of what follows (Chapters Four and Five, in particular) is devoted to the analysis of media: media present representations of the imaginary of IoT, and in so doing, describe the potential means of interaction between human users and IoT-devices. These means of interaction constitute a discursive set: they present as possible statements, possible events, possible modes of knowledge production—where knowledge runs the gamut from informal to formal—and therefore the possible means in which the world can be experienced.

Media (and by this I mean the semantic contents of media) provide descriptive glimpses of visions, visions of the future. On the other hand, however, the media formats that carry these visions also prime the recipient of the communication in subtle ways. Film does not convey what written text conveys simply by reason of film's and text's materialities. Nor can film and written text convey what a physical, held object can convey.

Where Foucault relied on his virtuosic historiographical ability as concerns the reading of archival materials, I rely here on my own abilities of analysis to identify a contemporary set of discourses subtending the imaginary of IoT, and further on the creative process of abductive analysis to infer what forms, what constellations, such discourses might take in a proximal future defined by IoT. Stated again, but differently, I seek to identify the potential characteristics of an archive that will arise from the social imaginary of IoT.

My approach to discourse—that is, the means by which I will gain access to the archive of discourse—occurs largely in two forms. The first is by means of distant reading. To that end, the next full section of this chapter will address the method of Latent Dirichlet Allocation (LDA) fully. In what remains of this section, I will describe the other: what I refer to as translational distanciation.

3.3.5 Translational Distanciation

Chapter Five deals with a high number of non-textual materials, or rather, materials that are not purely textual, not purely inscriptions on a page. They are both representations and captures. While discussion and analysis of inscriptive or inscriptive-adjacent texts will be present (e.g, discussion of emails, landing pages, and narration), the majority of materials are not easily reducible to inscribed text alone. These materials—videos, diagrams, packaging—certainly constitute 'texts' in the semiotic sense and in the sense of D.F. McKenzie's sociology of texts. But they are also extra-textual: in their physical makeup, their material qualities and characteristics, they form a sort of text that is greater than any semantic inscription they bear. Inscriptions enter into the world through video and packaging in a way that is phenomenologically different from that of text on a page: their spatiality, temporality, and linearity are apparently different from the left-to-right, top-to-bottom flow of (English) writing.

Because of the apparent differences between the forms of textuality I will analyze in this chapter, it becomes necessary to explore and justify the function that writing about these extra-textual materialities plays in terms of analyzing them: in writing about the extra-textual, and therefore translating the reality of the image (both static and in-motion) into the realm of the symbolic, the textual, one risks performing a destructive reduction. Given that the product of this project must, in accordance with university traditions and regulations, take the form of a written document, such a reduction is compulsory. Precisely because it is compulsory, it merits consideration.

Now, there are many potential places to begin this consideration. (It is not new territory, although I do hope to contribute to its mapping.) But rather than beginning with Walter Ong, Gadamer, or Max Van Manen, I will begin with something I heard a long time ago in the backstage-basement of a music venue on Halsted in Chicago: 'Writing about music is like dancing about architecture.' There, smoking cigarettes in the kind of midwestern humidity that gets trapped in concrete-walled basements, while sat on boxes of beer waiting to go on or for a friend to get off stage (I don't remember date exactly, but the place is clear in my mind), I was certainly not the first person to hear this line. In fact, it has been variously attributed to Laurie Anderson, Steve Martin, and Frank Zappa, among others. That it is so widespread hints at the kernel of truth that resides at its core.

This is not to say that it is useless to write about music, or indeed to write about anything that is not already written: the written word, inscription, is the birth of modern history, the site of historiography and the very stuff that perpetuates the archive—if the stuff of perpetuation is not merely viscous and genetic. The logical effect of this statement is twofold: first, that which is written is historical, and in its historicity, it is real rather than merely symbolic—writing makes real the symbols of thought, no less real for their existence in the mind and body than that which exists in the more readily observable world; second, the act of translating that which is non-textual into written text is necessarily an historicizing act. If to write is to historicize and to historicize is to make real, then I have chosen to write through, to translate, the non-textual materials that are the core focus of this chapter in order to make real the possibilities they present: futures, after all, must begin in the imagination.

To render a document or statement historical through inscribing it seems simple enough, but this simplicity is deceptive. This deceptive simplicity comes to the fore when the relationship between text and history is considered alongside one of Vilém Flusser's core theses: we are witness to the end of history (Flusser, 2015b). Based on Chapter Four of this dissertation, it should be apparent to the reader that I am not wholly in agreement with Flusser, but rather that I hope to qualify his statement (just as I hope to demonstrate that the mechanisms of discursive transformation referenced but not identified by Foucault can, indeed, be identified).

Rather than the end of history, resulting as Flusser would argue from the subjugation of the human by Fascism and of human-centered communication by the technical image, I see the birth of functional immediacy, a history of the long present tense. (As Bruce Springsteen said, 'Maybe everything that dies someday comes back.') As I have already argued, the temporal and phenomenal relationship between the human analyst and the super-human speeds of processing that must surely be considered the practical heart of computerized empiricism, creates a temporal loop. The perpetuation of this loop constitutes a new periodization into which all previous history (that is subject to the transformations inherent to the 'digital age') is translated.

The computer crunches data at speeds phenomenologically inaccessible to the human analyst; the human analyst possesses access to an *umwelt* (complete with its own rhythms and temporalities) categorically inaccessible to the computer; the game of catch-up and translation that ensues comprises a long present tense: the computer is used as the doomsday weapon of the objectifying goal of empiricism (a sort of weaponized Domesday Scroll-Codex Chimera); but in objectifying phenomena, this weapon removes them from the realm of the human, of the subject; the human analyst, then, must translate these phenomenologically empty objective findings (through additive processes of inference) into a form that is human-subject relevant. Because of

the very limitations in temporal processing that separate, at a basic level, the human from the computer, this act of translation is slower than the act of computerized analysis. What results is a sort of moveable epistemic and ontological racetrack around which the human analyst jogs, and the center of which moves forward in time into ever more minute speeds of processing. (It is an absurd progress: Sisyphus, like the suburbanites of the 1980s, has learned to jog.)

In this long present tense, we and our computational companion species become the very moveable parts that for Kittler constitute media. As the track moves forward, the human-analyst-turned-jogger can never actually finish a lap. The motion is perpetual, the track never-ending, and the relationship between the two an ongoing ebb and flow between spectrally overlapping but ultimately discrete phenomenologies. The incommensurability of the forward motion of the track and the jogger's motion upon the track does not destroy history, but rather births it anew as a history of the long present tense, a history of potentials: a history of the difference in the jogger's speed and the speed of the ground upon which she runs.

In this long present tense, one finds an overlap between the historical and the contemporary: one finds the entrance into the archive by way of archival documents (Buckland, 1991, 1997), or vibrations (Latour, Jensen, Venturini, Grauwin, & Boullier, 2012; Tarde, 2009), or statements (Foucault, 1982); or networks (Kittler, 1992); or media-containing media (McLuhan, 2016). (The language to describe these entities varies depending on one's disciplinary background, but I believe they are all, at their core, interchangeable in the present context.) In short, one finds that we are always already living in an instantiation of the archive, but that the current instantiation—girded by computer processing and the technical image—is one to which we have (functionally) real-time access, if 'real-time' be defined by the temporality of human experience and thought—the forms of temporality that punctuate the human *umwelt*.

Our access is ‘functional’ because to access the archive is to analyze the archive: to read its contents, to recognize the armature that births an imaginary wherein the act of watching the little robot that vacuums my floor every morning is not patently absurd or terrifying, but simply marked as ‘progress.’ To access the archive is to admit its existence as something separate and separable from myself (from the human-as-subject) and therefore to distance the subject from the archive. To access the archive is to create oneself as the archive’s Other, and in this Othering of the subject, the subject steps aside into a lateral present tense where she is at once both subject and object, both the One and the Other: not a present tense of action in the world, of sunrises and tides, or car crashes and serpentine belts, but a present tense of thought, a distanciation. To reside in this lateral present, encompassed by as much as it produces the long present tense, is to be an historian in an era where ‘history’ has changed its meaning through its own death.

And here, with the mention of ‘distanciation,’ is where the subject-human-analyst gains a foothold, where the act of translating the non-textual into the textual becomes valid as a means of analysis. That which is phenomenologically inaccessible to the human must be translated in such a way as to render it accessible: a translation from the machine-experiential to the human-experiential, the human-readable. This translation occurs through the act of writing; it occurs through writing because of the distanciating nature of writing, of the written text. (NB: I use the term ‘distanciation’ in much the same way as Ricoeur [Ricoeur, Blamey, & Pellauer, 2004].)

But before I move, for once and for all, into a description of this distanciative mode and then into the mode itself, I must clarify one thing: it is not the format of non-written documents that is phenomenologically inaccessible. Surely, we can watch videos; we can hold packages; we can see diagrams. They, like anything else we can say ‘exists,’ are in some way part and parcel with and

of our human *umwelt*. But this does not mean that the imaginaries they produce, implicitly instantiated through infrastructural skeletons of wire and code, are phenomenologically accessible. In fact, I argue that they are not. Plain and simple. They are the specters of the Other, the phenomenological world of the Other: the phenomenology of the deconstructed.

It is through the representation of these imaginaries via such common non-textual modes of communication as video, packaging, and diagram that the inaccessible is familiarized, is presented as accessible: the discursive anatomy and physiology of these imaginaries is disguised by their transmission via familiar media. That which appears through these media is but a fragment of that which appears in the world of the media. A novel discourse network and the life of the human bounded thereby presents itself through the translation of itself via known media, known discourse networks. It is only in the process of distianciative writing that the human analyst can sufficiently remove herself from the Trojan-familiarity of the video, of the email, of the materialistic package, in order to infer the structure and function of discourses in that computerized category of the archive (once formerly a human archive of writing and analog technology) which serves as impetus for the creation of the video, the email, the materialistic package and those other forms of enrolling devices that will be analyzed in this chapter.

What I am calling translational distanciation refers to the act of describing and analyzing one media format via another: in this case, say, describing and analyzing the contents of a video by translating it into a rich text. I have not, however, adequately addressed the second term, although I have already used it a few times.

The relevance of ‘distanciation’ is born of its placement within the greater domain of phenomenology. As I have already (in Chapter Two) done some small work towards familiarizing

the reader with my own approach to phenomenology, I will not repeat myself here. I will, however, borrow from Max Van Manen, who writes: "[…] the space of writing has a different temporal-spatial quality of immediacy that is near and distant. Writing is not just translating speech into text. In writing and reading, one inevitably adopts a relation to language that is reflective" (Van Manen, 2014, p.362).

In this spatial-temporal realm of reflection, one sees the time and space that differentiates our human-analyst-jogger from the speed of her moving racetrack. We see, in fact, all (good) analysis. (There can be no analysis, I think, without some form of reflection—analysis without reflection is not analysis, but receipt.)

Van Manen continues: "[…] the world of the text has its own special reality, an unreality, where words may acquire depthful meaning or a certain indeterminacy of meaning. [….] It is the minded act of writing that orients itself reflectively to a notion that is a feature of lived experience" (Van Manen, 2014, p.363). I argue that what is required if we are to gain access to the increasingly ubiquitous, and therefore increasingly invisible, loop extant between human analyst and computerized analysis, we must engage in the process of phenomenological writing: it is through the distanciation of writing and reading, the existence that occurs in the unreal reality of the text, that we may sufficiently gain independence from our constructed absurd race in order to see more deeply, to understand the discourses upon which the imagined futures of IoT are predicated: to access those facets of the archive to which we might have access, but to access those to which our phenomenological limitations merely allude.

3.3.6 Distant Reading

In the last section, I said that my primary mode of ingress into the observable world of discourse is distant reading. In this section, I describe my logic for using distant reading. I also provide a detailed description of the type of distant reading I employ.

Broadly, distant reading is a reaction to the problems of close reading when it is combined with an ever-expanding corpus of literature. Franco Moretti, the 'inventor,' if you will, of distant reading, couches the need for the practice in lines from the Annales School historian, Marc Bloch: "Writing about comparative history, Marc Bloch once coined a lovely slogan, as he himself called it: 'years of analysis for a day of synthesis'" (Bloch as cited in Moretti [2000]). At first glance, there is little wrong with this summation. Indeed, this is the mode by which great historical texts (and historiographical texts) have always been written. And this is fine—if the focus of historical inquiry is a period of time that is 'largely static.' By 'largely static,' I mean to say a period of time that has definitely passed: an era, an epoch. The long eighteenth century comes to mind.

That it has passed is important because that characteristic allows for its periodization. Once periodization is effected, then boundaries are placed around the events contained in the period. The period becomes an event. (Here, with the use of the term 'event' I allude to the historiography of the Annales School, in-depth coverage of which can be found in the introduction to Part II of this dissertation, as well as in Chapter Four.) The 'event' of the long eighteenth century is defined topically by the works that have become canonical. A little Hume, a little Locke, a little Bacon, etc., etc. (See Siskin & Warner [2010] for an argument towards including Bacon in the long 18th century.) But in creating the event of the century through not only periodizing but canonizing

certain works, we also create a non-event: those aspects of living during a given period of time that go unknown or forgotten as a result of periodization and canonization.

Nevertheless, the formation of an epoch by means of historical inquiry is ultimately beneficial. Such boundaries allow us to say things like, 'That's not part of the long eighteenth century because it happened in 1880.' This is, admittedly, something of an oversimplification, but it serves an illustrative point: to periodize is to constrain. Constraints in this instance are as beneficial to the historian as they are to the poet: only certain acts are possible. An historian dealing with the long eighteenth century is limited to analyzing the contents of archives (and the archive) directly stemming from that period of time. If that's the case, then why is the period in question 'largely static' and not purely static? Because the period—the period-as-event—changes in relation to the historical *a priori* in which the historian works. It is changed retroactively so as to speak to the present, about the present, through the present.

There are only so many works that were written in the long eighteenth century. Being a period that has passed, there will be no more. But to read everything written then is impossible within the scope of one human lifetime. So, as Moretti argues, another approach is necessary. We forego close reading for distant reading.

In the act of distant reading, I argue that one finds a method for aggregating the additional fragments of a given period—particularly when that period is still unfolding—that supplement the 'event' and allow for its analysis as a non-event: that allow for the identification of the mundane milieu that surround the event, itself an indicator of the constellation of discourses involved in the production and maintenance of the event.

In his operationalization of distant reading, Moretti had a broad and deep impact on the burgeoning field of Digital Humanities. Although these two terms—'Digital Humanities' and 'distant reading'—as deftly argued by Ted Underwood (2017) can be demonstrated to refer to different analytical traditions that emerged from separate communities in the middle of the twentieth century, they have, of late, come to resound in consonance. Both 'Digital humanities' and 'distant reading' describe a greater trend towards the 'macroscopic' analysis of literature or literary history (Underwood, 2017). This is very much in-line with Franco Moretti's conceptualization of distant reading as a method of analysis by means of which we might return to the grand notion of a 'world literature.'

In his monograph 'Distant Reading,' Moretti (Moretti, 2013) calls for "a return to that old ambition of *Weltiliteratur*" in order to study the "planetary system" of literature (p.54). In the move from canon to planetary system, a question of scale becomes immediately apparent. How does one move from the closeness of reading to a distant, telescopic view? The answer is scaffolding:

> […] the study of world literature will somewhat have to reproduce this 'page'—which is to say: this relationship between analysis and synthesis—for the literary field. But in this case, literary history will quickly become very different from what it is now: it will become 'second hand': a patchwork of other people's research, *without a single direct textual reading*. (Moretti, 2013, p. 57)

In claiming that distant reading can aid in the reconstruction of a 'world literature,' Moretti makes a claim that is analogous (though far afield) to my own: the goal of both is to render a greater and more visible totality with regard to a given event, a given period, a given historical *a priori*. (In Moretti's case, the 'event' is the existence of a world literature; in mine, which resides in the negative space created by Moretti's methodological claims, I seek to aggregate the latent, the mundane that both surrounds and is enveloped by the event—the rise of IoT.)

Just as the reader—a human possessed of certain skills both innate and learned—always already defines the role of a reader—a user of texts—the algorithmic constructions that allow for distant reading always already constitute a new form of 'textual user.' It just so happens that this particular user exists as a middle man: an interlocutor between vastly scaled corpuses and the traditional reader, the human, who then interprets their output. Along this line, although less explicitly, Stephen Ramsay has claimed that:

> "Digital Humanities is about building things. I'm willing to entertain highly expansive definitions of what it means to build something. I also think the discipline includes and should include people who theorize about building, people who design so that others might build, and those who supervise building (the coding question is, for me, a canard, insofar as many people build without knowing how to program). I'd even include people who are working to rebuild systems like our present, irretrievably broken system of scholarly publishing." (Ramsay, 2011)

If the world may well be 'turtles all the way down,' and the information sciences disciplines with nothing at the center (Lyytinen & King, 2004), then DH may well be construction all the way up. As such, the construction—the DH scaffolding that tries and tries to effect an epistemological colonization of itself by the quantitative methods most usually employed in the sciences—must come under scrutiny. We cannot rely on it or its trappings blindly.

Ultimately, however, it is the human perspective, the bird's eye view (or the algorithmic view as the case may be) that is created through the erection of scaffolding, and therefore must be analyzed just as the view it allows must be analyzed. DH, as with other disciplines that have been colonized by the force of computation, becomes an extension of Enlightenment mediation: an increasing system of apparatuses (both natural and artificial) strung together so as to generate knowledge (Siskin, 2016). But, as was the case for Galileo and his increasingly powerful telescopes, the viewer whose eye is thrown to the heavens through magnification is the ultimate

interpreter: the artifice of scaffolding, of mediating interlocutor, becomes the shoulder upon which one stands to see further. But it is the act of seeing that matters, not the act of standing. A telescope is of no use to a blind man; an algorithm for textual analysis no good for a human without the human concept of literature.

In his view of distant reading, Moretti's "direct textual reading" is bypassed via scaffolding, the essence of Digital Humanities—the construction of a sociotechnical vantage from which to view the whole "planetary system." The "planetary system" *becomes* text by way of digital re-inscription. The scaffolding provides the context for knowledge production by way of extending the now-resident digital alien (cf. Alan Liu [2004]) of DH to pre-digital texts. But the scaffolding is more than just context – it is the context *and* the knowledge produced, an artificial hypotext referring to itself through the spectrality of digital inscription. It is the sociotechnical assemblage by which linearity can be assigned to "a device, a trope, a limited narrative unit" (Moretti, 2013, p. 61), but an assemblage that bears an *a priori* relationship to the otherly-inscribed texts it analyzes. It has only itself as its object of study and must methodologically account for itself. In this formulation of distant reading, it seems necessary to introduce a new motive for research—or rather reintroduce an old one: interpretation.

The application of distant reading to a corpus allows for the generative reassembly of that corpus, and therefore constructs a new, latent text that always already exists within that corpus. This generative reassembly must be a site for interpretation just as any corpus of text must be a site for interpretation. Such interpretation presents as a novel location for the addition of supplemental, fragmentary statements that, in their aggregation with latent discourses allowing a given event, allow for the construction of the mundane around that event—allow for the inferential construction of the non-event, the human experience of that event as mundane.

While I frame such a claim in science studies, similar claims have been made from within the DH community. Emily Earhart, for example, has claimed that the turn towards digital humanities, and particularly distant reading as a definitive practice within DH, represents a move "away from representational concerns and toward interpretive functions as contemporary digital scholars, such as Stephen Ramsay, Franco Moretti, Matthew Jockers, Geoffrey Rockwell, and others, are using technology to devolve, manipulate, and reform the literary text" (Earhart, 2015, p. 91). Earlier work from Mark Olsen at the University of Chicago makes similar claims:

> It would seem that the use of computers to analyze the linguistic and symbolic environment — the collective and social elements of language — in order to understand individual texts and rhetorical stances, suggests that computer aided analysis of text should play a central and well defined role in our understanding of text. This role fits the strengths of computational analysis and the theoretical models used to inform research on text and language. This requires a move away from the traditional literary emphasis on the author's intention in writing the text and the stylistic construction of individual texts. Modern critical theory, particularly of the structuralist and post-structuralist traditions, provide precisely that theoretical opening. (Olsen, 1993, p. 313).

For Olsen, the potential usefulness of computationally derived textual analysis is already validated by the emergence of more interpretive literary traditions: a move away from all corners of the intentional fallacy and toward the social construction inherent in a text, but it seen from a structuralist or other vantage. While the novel always tells a story, the text always relies on a human. As stated above, then, this scaffolding becomes not only a site for analysis, but a new subject for analysis: it is both analytical tool and artificial construction deserved as as much scrutiny as those texts it was built to analyze. The question of scale is of the utmost importance: scale allows for vantage, for abstraction; but all that is seen from any given level of abstraction must ultimately translate back to the level of the human-readable, to a level that is a valid to the naked eye as it is to the artificial eye.

So, I argue that a digital method like distant reading must interpret itself; it is the contemporary tendency to rely on the *prima facie* validity of pervasive, computerized and disembodied representationalism that lurks behind the knowledge productive phenomena of DH (and big data) that deserves interpretation. Moreover, it is in this growing invisibility of the digital that Foucault's historical *a priori* of the inscribed humanities archive becomes a *pervasive epistemic a priori*: an artificial and invisible scaffolding presenting with the appearance of an 'always already' materiality that retroactively transforms the archival materialities of the past in such a way that they are invisibly contextualized by contemporary modes of knowledge production. That the *a priori* condition becomes one of pervasiveness is a result of the increasing concretization of digital methods as unmarked categories: as simply the way knowledge is now created, as if the digital qualities of such methods require no scrutiny or reflexiveness.

But the discussion of distant reading has, up to this point, taken place solely in terms of its applications within the study of literature. This is a symptom of a greater trouble within DH: that 'Digital Humanities' refers most closely to a 'digital literary studies' rather than those other finds that equally comprise 'the humanities,' such as history or philosophy.

3.4 Distant Reading as Contemporary History

Grounded in the understanding of Annales School historiography, as well as in the Foucauldian notion of discourse, in Chapter Four I leverage distant reading as a means of interpreting texts as historical documents: if, as I have argued above, each and any identified period of time (from the second, to the hour, the day, to the centuries of the *durée moyenne*) can be constructed as an event, then each of these fragments belongs to a greater trajectory: that of history

itself, a history of the present tense. As such, the disassembling of a corpus of contemporary documents by means of distant reading can be seen as a useful methodology for identifying and interpreting the discourses that subtend any given 'event' within a greater history.

I'll state this again because it is central to what follows: a corpus of documents written at a given point in time (say, a weekend in 2015), and indexed (as in a folksonomy) in some way to indicate topical coherence, can be disassembled into the latent topics that comprise it. If this corpus of documents is tied to a particular period of time, then it is also tied to the greater periods of time that contextualize them (i.e., the archival historical *a priori* that defines the *durrée moyenne* in which the corpus was created)—it is only a matter of reframing the 'event' to see the lineage between the contemporary event and its historical antecedents. Similarly (and here's the rub) it is also a matter of reframing the event in such a way as to allow the corpus representing said event to hint at the event's discursive futures: its trajectories; the potential discursive transformations that reside within the discursive construction of the event as manifest in the materialities of communication that characterize that event. In applying distant reading to a corpus of documents pertaining to a weekend in the life of IoT, as I do in Chapter Four, I seek to perform an historical analysis of the potential futures resident in the discursive constellation that undergirds IoT: I seek to perform a discourse-history of IoT's future.

And so, it is germane to undergo an analysis of the method itself: a methodological interpretation of distant reading, and more specifically, the algorithm underlying Latant Dirichlet Allocation (LDA). Following discussion of this algorithm, I will then address the extent to which its results, called 'topics,' fit into already well-explored theoretical realms, including the Foucauldian notion of 'discourse.'

3.4.1 Latent Dirichlet Allocation

LDA, is a an algorithm developed by a team of statisticians lead by the Bayesian statistician David Blei (Blei, Ng, & Jordan, 2003). It has gained a great deal of traction within the DH community largely because it has the appearance of naturalness. That is, the performance of LDA requires very little in the way of textual preparation: one simply cleans the text such that it is machine-readable and runs the algorithm, which then churns out a predefined number of topics (each comprised of a predefined number of words) that appear as coherent, if latent, within a given textual corpus.

Where this method becomes particularly interesting is when it functions as an explicit interlocutor—not as a mere filter applied to a large corpus and then discarded, but as an additional facet or aspect of a corpus which is then theorized alongside the corpus, the latent structure of which, its use is intended to describe.

Approaching the LDA algorithm as a kind of filter is, for the purposes of explication, necessary in order to save us from a lengthy detour into Bayes theorem—something which surely falls outside the scope of this project, broadly defined though that scope may be. LDA-based topic modeling is a particular way of viewing a text, or rather rendering sub-textuality visible. As Underwood writes, "Of course, we can't directly observe topics; in reality all we have are documents. Topic modeling is a way of extrapolating backward from a collection of documents to infer the discourses ("topics") that could have generated them" (Underwood, 2012). In generating topics that cannot be seen directly, LDA topic modeling exists as a sort of prosthetic lens: a means for seeing what is theoretically there, but otherwise invisible. It renders visible what might only be

inferred through lengthy and grueling processes of distant reading. Moreover, it renders these inferences visible relative to a corpus too large to engage with close reading. To render such invisible topics not only visible but *meaningful* requires the reinsertion of the human reader: an interpretive user of texts.

In the approach embodied by LDA, texts (or the sites of textual inscription rendered machine-readable) present as the carriers for discourses, but these discourses are not necessarily or immediately apparent to the reader, either for reasons of semantic structure (as in, say, a naive reader interpreting the works of William Blake) or for reasons of sheer size (as in the case of treating the entire run of the New York Times as a corpus). As such, the application of LDA is particularly well suited for exploratory analysis: one works under the assumption that there is meaning within a text, but that such meaning (occurring in the form of discourses) is not immediately apparent to the human reader, but can be teased out, as if through the use of an alternate lighting source, so as to be made visible. If a single text, say, Blake's 'The Tyger,' can be demonstrated to have latent discursive content via close reading, then the same logic applies to a large corpus of texts. What's more, the application of LDA to a large corpus of texts makes possible the identification of discourse that no human eye could identify. Taken in the context of the aforementioned purpose of utilizing LDA for the analysis of a weekend in the life of IoT—to abduce potential futures that reside within IoT—we see that LDA, in its exploratory efficacy, is ideally suited to the task. In its ability to identify, with the aid of a post hoc human interpreter, latent topics within a corpus, then that same human interpreter can execute a process of abduction whereby the interaction between identifiable discourses might be projected into the future. This is the heart of a history of the present: exploration. What if not exploratory can any study of potential futures be?

What results from the performance of LDA is not unlike the results of a series of x-rays taken on a human arm, but presented without any reference to the fact that the olecranon process is proximal to this or that bone: in the form of topics, LDA presents a disjointed list of discourses that are to be found, somewhere, lurking beneath the skin of an inscribed text. In that they can be disassembled and identified from a compiled text, they, too, can be reassembled to identify potential future constellations that may occur and yield discursive transformation, or the allowance of novel statements. In short, LDA disassembles and reassembles the text(s) to which it is applied, leaving the human interpreter with a new version of the text that is to be interpreted and read like so many tea leaves (Chang, et al., 2009).

That an entire emerging field of scholarship, DH, has taken so quickly and firmly to the practice of LDA topic modeling supports the point put forth by Earhart and discussed earlier: the move to LDA represents a shift back to interpretation, but an interpretation that is inherently exploratory. It is this inherent sense of exploration that ideally suits LDA to the purposes of identifying and interpreting the discourses that subtend a contemporary event within a given historical *a priori* (a particular constellation of the greater archive).

In its deconstruction of a text—not necessarily in the Derridean sense, but in the sense of dismemberment—the analyzed textual corpus is simultaneously reconstructed as separate parts, which are then subjected to reassemblage by way of post hoc human interpretation. Just as the 'reader response' approach that arose from Kenyon College (among other schools) in the early to mid-twentieth century focused on the reader's interpretation of a text, so, too, does LDA rely on the algorithmic analysis of a text. Importantly, such an algorithmic analysis must always end in an act of interpretation: the value of LDA analysis always comes down to the value of the interpretation its creator applies. LDA exists as another tool in the textual user's kit.

The meeting point of algorithm and interpretation is an unexpected, even uncomfortable one for many scholars on both sides of the two camps (Snow, 2012). Nevertheless, the interpretive nature of LDA results bears out in the literature. For example, Chang, et al., (2009) conducted research that examined the relationship between the predictive value of topic models and the human perception of a topic model's semantic interpretability, its perceived relevance to a text. Surprisingly, the authors found negative correlations between the two: that is, as a model's predictive value becomes stronger—as the topics it derives become probabilistically more likely to describe the co-occurrence of words within a set of texts—human interpreters judge it as less relevant to the semantic content of the text it describes. Quite the paradox. Taken to its extreme, this paradox bears out some of the epistemological problems described in my close reading of Ashton (2009) in Chapter Two: foremost, the construction of two parallel epistemologies (the human- and the computer-derived), both of which are fundamentally inaccessible to the other. What makes sense to a computer in its phenomenologically obscure *umwelt* does not necessarily make sense to the human within theirs.

What this ultimately means is that the development of a suitable and meaningful topic model intended to describe a textual corpus must be done under the supervision of a human reader, an interpreter. (The text moves from human-readable to machine-readable and back to human-readable, but changed.) It is not a definite process, a mere click of a button. A text, in reaching its inscriptions back into the world that created it—the world to which it always already refers—is reliant upon what might generally be called the human experience of it. While texts come in all shapes and forms each form has in common with the other the end point of a human interpreter. Texts disassembled, 'devolve[d], manipulate[d] and reassemble[d]' require a reader to be validated

(Earhart, 2015, p. 91. As such, any algorithm that is performed in order to 'devolve, manipulate, and reassemble' a text must be performed under the supervision of a human interpreter armed with the heuristics of innate and learned interpretive methods. In short: assuming that the value add of distant reading is to render something otherwise unknowable knowable to a human, to meaningfully disassemble a textual corpus by means of submitting it to the realm of the computerized algorithm is only a valid and productive means of 'reading' that corpus if it is overseen by a skilled human reader, and subsequently reinserted into human epistemology. It simply must be interpreted.

It can be said that the creation of a topic model to describe a textual corpus is as interpretive an act as the form of direct textual reading that distant reading claims to skip. Some small worries arise, such as the presence of confirmation bias, but these are readily done away with: to interpret is to apply skills and cognitive heuristics gained through experience; to develop a suitable topic model fit for describing a text, one must engage some of these heuristics. If a topic model were created blindly, it would fall prey to some of the same criticisms that have been levied against more overtly interpretive (albeit empirical) methods as grounded theory.

No textual model exists in a vacuum, nor should it: to engage in the creation of a blind topic model would be to negate the value of the studying and reading, the experience and the generation of cognitive heuristics that come before it. That is, it would negate the fundamentally humanistic function that texts play in our world. Similarly, if a topic model were developed without the supervision of the human eye, even in such a case that it is possesses great predictive value, it is relatively meaningless without perceived semantic value as Chiang, et al. (2009) described—a value that must be bestowed by a human reader. No matter how many mediating interlocutors one

constructs and places between the human reader and the text, the text must ultimately—in all its variant forms—be considered human in part.

A brief foray into reflexivity: it is possible to see this coupling of machine-created topics and a human reader as an example of a thing constructed. This would not be inaccurate. Indeed, the process of distant reading, wherein each word, each gram, bigram, n-gram, is known, locatable, and interpretable to a computer, is itself a possible effect of the same archival forces that allowed for the rise of IoT.

But what does the heuristically guided performance of LDA analysis look like? The constructer of a topic model should take with them what is known already—the theoretically grounded assumptions from multiple disciplines and relevant interpreters, their hypotheses, their intuitions about a text—and seek to find a model that seems, in part, to fit. That's not to say that one should seek a model that exactly supports all of their assumptions about a text—this would, ultimately, be impossible anyway barring some kind of realized God Trick—but rather that one should, while constructing a topic model, bear in mind their understanding of the texts at hand as derived from prior study and seek to develop a model that can, in an exploratory way, shed new light on further avenues, further directions in which their extant beliefs about the corpus can be taken. That is, a good topic model should appear to the human interpreter to 'fit' well with some of their intuitions, but 'misfit' interestingly with some others.

At the meeting point of algorithms and interpretation, one finds many epistemic-rhetorical risks—and the stakes are particularly high. One risks failing to appease the quantitative researchers on the one hand, and the qualitative researchers on the other. Catastrophic failure would result in simply uninteresting research or knowledge products that have no disciplinary home. But there is

some hope, and indeed some levity in this possibility: would not a monstrous mixed methods mutt of a model summarize neatly the relationship that humans have with their sociotechnical milieu—the current historical *a priori* constructed as it is through a mishmash of computation and raw neuronal power—caught as they are between pre- and post-digital epistemologies?

In the construction of my own topic model intended to aid in the exploration of discourses contributing to the emergence and the futures of IoT, I have chosen to lean into this risk, to, in the words of Donna Haraway, 'stay with the trouble' (Haraway, 2017). Aside from reliance on intuition, this decision is based primarily on my own understanding of intellectual history—particularly through the lens of Foucault's treatment of discourses within his archaeological method.

In what follows, and pursuant to the interpretation of the *longue durée* presented in the introduction to Part II of this dissertation, I present an LDA topic model of tweets scraped from Twitter as a literary-historical snapshot: as a bag of words pulled from the air, from the sea-soaked wires and invisible waves of our mass communicative media, that represents a moment in the history of IoT. In so representing this moment, it provides its interpreter with a glimpse of the discourses that act to construct not only the past of IoT—it's origins and antecedents—but also its futures: the possible trajectories contained within the imaginary it represents.

All this talk of topics, though, does not draw the requisitely explicit connection between the concept of 'topic' as it occurs in LDA topic modeling and the notion of discourse. What follows does just that.

3.4.2 Topics as Discourses

Much of the relevant work about the relationship between topics derived from LDA topic modeling and the notion of discourse arises from the still-concretizing field of Digital Humanities. While the majority of these published works contain, or are entirely predicated on, simplifications or pedagogically-oriented explications of David Blei's original work in developing the LDA method, several provide challenging and intriguing discussion of just what a 'topic' is and how it relates to concepts more traditionally discussed in the humanities fields.

In work that predates the development of the LDA algorithm, the computational humanist Mark Olsen (1993) presages the role of LDA in approaching the discourses that comprise a text. In so doing, Olsen also implies the ever-present status of discourse: that is, discourse is not only a purely historical concept—observed post hoc—but one that must always already exist in any given present tense, even as it slips into the future as in the case of writing upon a page. Discourses exist at each level of the periodized event, the epoch: the *longue durrée*, *la durée moyenne*, and even *l'histoire événementielle*. One might even say that it is the discourses subtending events at each of these scales (and any between or outside) that serve to unify these varied approaches to organizing temporality and historicity along the greater, generalizable continuum of 'time.' As Olsen writes:

> […] systematic analysis of sign or language use across large blocks of text is amenable to both qualitative and quantitative analysis. The image of the Fortunate Islands (later the Canaries) or 'women's anger' can be examined systematically in a large database without resorting to quantification at all, simply by reading and comparing descriptions across many texts of many years. By contrast, one can examine the changing meaning of words that constitute the discourse of gender over long periods of time using quantitative methods that are well known and understood (Olsen, 1993/1994, p. 313).

But this deserves some unpacking, as primary focus appears to rest on the differing uses of qualitative and quantitative computer-aided literary analysis. Rather than addressing this particular tension, I draw your attention first to the temporality of this quote and subsequently to the role of the 'database.' The temporality of the data concerned in this quote—textual material contained in a database—is one of a relatively *longue durée*, or at least one that demonstrates the scalability of time as it occurs in the relationship between a *longue durée* and *l'histoire événementielle*.

One places this excerpt in such a temporality because of Olsen's use of 'long periods of time' to situate the discourse analysis to which he refers; one further realizes the scalability of the analytical temporality because of the compound rhythms at which data and analyst (as a dyad of human and computer, a thing!) exist: the data stretches back through the grand run of literary history, while the computer-aided analysis unfolds at a rhythm of such rapidity as to approach or succeed that of neuronal transmission in the human brain. Still further, and located temporally somewhere between the two, is the rhythm of the analyst whose experiential and formalized knowledge of 'literary history' and what it means to produce literary history unfolds over the scale of a lifetime. While Olsen's situating of discourse in a 'long period of time' most clearly hints at the relationship between his concept of 'discourse' and that analyzed by Foucault in his grand historical project, it (perhaps more interestingly) hints at the continued existence of such discourse across temporalities and rhythms: if it exists in one, and if we are to assume the experiential validity of the continuity of time, the it must exist at all possible scales of time that can be experienced or theorized. This applies as much to the moment of writing as it does to the moment of historical analysis, including both radically diminished intervals of time as occur in computer processing, but also the comparatively augmented temporal intervals at which the human experience of conducting research occurs.

As a restatement of this point about the scalar temporality of discourse: if, as Olsen insinuates, discourses are present in an historical text or corpus so as to be analyzable at a temporal remove (as is the basic case in historical study), then they must also be present in a text at the moment of writing and the moment of reading. If such a thing as discourse exists—and I think it does—then it is not bestowed after the fact, only through the long gaze of historical analysis, but rather at the moment of creation where textual creation is seen as belonging to a class of actions that itself belongs to a cultural archive. Discourse is inscribed into a text at the jussive moment of the text's inscription: it is always there, latent or overt, within the linguistic weave of the inscription.

Olsen continues, further on the same page, with a consideration of the relationship between the author and the symbolic constellations of discourses to which they have access:

> Authors function within symbolic universes of which they can only be partially conscious. If I am correct in assuming that computer analysis of large bodies of material for relatively simple constructions reveals elements of discourse that are beyond the control or awareness of an author, then studies of individual authors and texts will be rendered more ineligible by highlighting the ways in which an author uses, modifies, or rejects contemporary symbols. Indeed, selection of interesting or important rhetorical shifts or manipulations would seem to presuppose careful identification of general patterns of discourse. Knowing what language is available to an author — the symbolic universe in which he/she operates — is a vital part of interpreting the intentions and limitations of the text (Olsen, 1993, p. 313-314).

Underwood (2012) argues that the topics derived from LDA topic modeling 'probably always have the character of 'discourses,'' despite the fact that the size of the corpus analyzed is likely to have an effect on the granularity of topics generated. That is, the term 'topic' is ambiguous in its usage and application across differently sized corpuses. (As Underwood notes, LDA's creator was pointedly 'agnostic' as to the theoretical value of the term 'topic,' preferring to reduce the

notion of 'topic' to that of a 'latent variable.) Underwood (2012) compares his own LDA work on 'volumes of 18th and 19th century words' to Lisa Rhody's work that focuses on much smaller document: poems. Rhody's (2013) work, discussed pre-publication in 2012 and published the next year in a paper called 'Topic Modeling and Figurative Language' highlights the value of LDA analysis in identifying and partially explicating the:

> types of questions we are looking for as humanists. What this small discovery shows is that topic modeling as a methodology, particularly in the case of highly-figurative language texts like poetry, can help us to get to new questions and discoveries — not because topic modeling works perfectly, but because poetry causes it to fail in ways that are potentially productive for literary scholars (Rhody, 2013).

Underwood reaches a similar conclusion in describing his own use of LDA: certain topics are particularly difficult to parse, 'but for a literary scholar, that's a plus.' He further writes that he wants 'this method to point [him] towards something [he] doesn't understand' yet, noting further that he 'almost never finds that the results are too ambiguous to be useful' (Underwood, 2012).

If topic modeling presents as ideally suited to address the types of questions that reside at the core of the humanities—particularly in terms of the figurative language of poetry—then it must be equally suited to the identification and analysis of discourses within contemporary history. What is more figurative, more poetical, than the synchronicity of documents, created by myriad authors dotting the face of our planet and its present tense, that serve to describe (in aggregate and singularity) the goings on of the world itself as funneled through a certain indexing term?

But still, before moving further, the usefulness of LDA for exploring the discursive composition of a social imaginary that births a socially authored text—or indeed gives rise to the possibility of considering myriad, unique, and individual tweets as a form of text—should be

further explicated. To do so, I turn to the work of library and information science scholar Ronald Day.

In the introduction to his monograph, 'Indexing It All,' Day (2014) engages in a discussion of the relevance of terms within a given text, particularly as they are represented and organized within that text's index:

> A term is meaningful within the book only because the book is meaningful within a field discourse. The best indexes are not just machine-made, but are human-made by experts that understand not only the page or the documentation referents of the indexical terms, but also the universe of meaning and sense that makes some of the document's terms more important than others and gives them certain meanings and sense. Human indexes are what machine algorithms strive toward but the use of various syntactical and semantic techniques and technologies (Day, 2014, p.7).

We might begin to extrapolate from this statement about the relationship between terms, indexes, and books by aligning indexes with topics and books with a corpus of tweets. (In this comparison between LDA in indexing, 'terms' already aligns with 'terms,' just as 'discourse' aligns with 'discourse.') In aligning these two models—that of the book's index and a corpus' topic model—Day's analysis becomes all the more insightful. In an exploratory sense, it is possible to view the construction of a topic model by means of LDA as a kind of exploratory index: one of many possible maps that could be drawn not solely of terms as they appear in a corpus, but of terms as they co-appear and limn the specter of a discourse or discursive constellation.

In this light—shining as it does against the blind, assumed validity of big-data approaches—it is not the computerized nature of LDA topic modeling, pregnant as it is with processing power and complex maths, that gives it its worth; it is, rather, the interpretation of such a machined model by the human expert that gives the model its worth. But something funny

happens from this particular vantage: one constructs a text not from a set of tweets, but rather from a string of terms, organized as topics, that approaches what Flusser would call mystical communication—pre-inscribed thought unsubjected to grammar or syntax, or the stylistic rules that govern prose and the printed-page-as-media-format. This approach, then, uses the form of the book as a metaphor allowing the model's interpreter to assign to the corpus a transient textuality that ultimately allows for the creative destruction of such textuality: one imagines a text so as to index it; one indexes it in the form of a topic model so as to erase the imagined image, to move beyond the metaphor of the book. This is precisely the role of LDA in the production of historical knowledge: to intercept the book before it is a book, before it exists as evidentiary document, but while those elements that might assemble to form an evidentiary document are still free-floating in synchronicity rather than synchronousness. It is the role of the reader in this distant style of reading would-be historical documents to discern between topic models in such a way as to use that which, according to their knowledge of the "universe of meaning and sense that makes some of the document's terms more important than others and gives them certain meanings and sense," allows for productive dissection of the would-be text, thereby bypassing the metaphor of the book or completed text and encountering that which 'might be a text:' encountering the sociotechnical, cultural and historical rules that allow for such a potential text. Put differently: the careful curation of a topic model provides indirect access to the archive as it existed at a point in time—within the long present tense—and relative to a certain number of user-subjects.

In so theorizing the applicability of topic modeling for the analysis of a history of the long present tense, we are entering, to my knowledge, uncharted methodological waters. We are not, however, entering virgin waters. That is, other scholars have attempted to analyze IoT by means of LDA analysis. As the next section will demonstrate, however, the application of this form of

topic modeling for the analysis of IoT has not been deeply enough informed by theory or, indeed, interdisciplinary. Still, some small gains have been made.

3.4.3 Prior Applications of LDA in IoT

If one is to leverage any distant reading method to identify and describe the discourses present in a given corpus, it is of the utmost importance that such an investigator is trained in interpretation, or if not formally trained, then possessed of the broad, interdisciplinary knowledge necessary to derive informal, but informed, heuristics for comparative interpretation. As this section will demonstrate, the execution of LDA topic modeling without the proper application of theory—without the necessary framing to contextualize the results of the topic modeling—the results sit like so many dead fish on a table. They are certainly there, but they are unpleasant, neither useful to the sea from which they are pulled nor to the consumer that might ingest them.

Bian, et al., (2016) conducted, among other analytical exercises, LDA topic modeling on a corpus of tweets scraped from Twitter, the results of which ere published in PlosOne. The project described in their paper was undertaken in order to determine the qualities and facets of public opinion regarding IoT. It is worth noting that the analyses conducted by Bian and his colleagues were applied to historical sets of Twitter data, comprised of randomly sampled tweets over the course of three discrete periods of time. As such, the study conducted by Bian et al attempts to analyze public opinion of IoT as it occurs 'in the wild' of Twitter.

Although the results presented by Bian, et al., (2016) are promising, they are somewhat lacking in their theorization. That is, they are presented as almost exclusively descriptive. For example, the topics developed through their LDA analysis of Twitter data were labeled, through a process 'based on human judgment' (Bian, et al., 2016, p.9/14). As noted above, the application of

human judgment is necessary for the creation of a optimally meaningful and interpretable topic model: however, a certain amount is required. The human judgment to be applied must rest on the foundation of wide theoretical knowledge—that 'universe of knowledge' to which Day (2014) alluded.

Bian et al (2016) leveraged human judgment to devise the following topic descriptors: "smart technologies," "connected device," and "big data." Additional topics discovered, but not expected by the authors, include: "emerging security" and "industry leaders" (p.9/14). That unexpected topics arose is a point in their favor: as stated earlier from members of the DH community, a good topic model presents its constructor with creative problems. Such creative problems undoubtedly come in the form of unexpected topics or topic compositions. But, that a topic concerned with security would be unexpected indicates an undesirable level of naivety. One similarly has to question the theoretical depth of their chosen topic descriptors by the considerable (and unacknowledged) overlap between 'smart technologies' and 'connected device.' Although a suitable operationalization or semantic boundary for the term 'smart' has not yet been reached—it will be presented over the course of my own LDA topic model to be discussed presently—it seems likely that the 'smart' quality of a technology is related to its connectedness. Similarly, the authors leave much room for interpreting the relationship between 'device' and 'technology,' or the idea that 'big data' can be a factor of connectedness.

The authors' theorization of these topics is disappointingly sparse. The 'smart technologies' topic, for example, is explicated as follows:

> Smart home systems are already on the market, and production and advancement of smart cars have led the automobile industry. Many highly dense cities are undertaking smart city projects. Based on the top words used in this topic, public opinions seem positive for smart technology, but there is a concern apparent by the term 'hacking' (Bian, et al., 2016, p. 10/14).

Even for topics that were not expected, such as 'emerging security,' the authors do not engage in much interpretation: "As seen in this topic (and in previous topics already), 'security' and 'privacy' seems to be a great concern for the public. At the same time, the topic term 'emerging security' also implies that some discussions were about positive opinions about the IoT to fix existing security concerns' (Bian, et al., 2016, p.10/14).

Nonetheless, their work is relevant to the current project because from it they are able to conclude that: "topic modeling, in particular, the LDA model, is a viable approach to learn characteristics of a concept based on Twitter datasets" (Bian, et al., 2016, p.9/14). Although I assume that the interpretations of these topics is apparently sparse to the reader, I will outline what I find to be missing: grounding in extant sociotechnical theory. That is, while the authors contribute to the IoT discourse in a meaningful way by validating LDA topic modeling for the analysis of IoT via Twitter data sets, they fail to provide meaningful interpretations of the results of the topics. Researchers with even a passing familiarity with IoT should expect notions of privacy and security to rear their mired and ugly heads; similarly familiar researchers should expect the appearance of 'big data.' To put forth through a process of identification the notion that these topics exist as latent structures within the broader topic of IoT is simply not enough: what is required is a greater, deeper theorization of what these topics mean, how they relate to the broader historicity of IoT and the historical *a priori* from which IoT springs.

The lack of theoretical grounding is further evidenced in the authors' (2016) conclusion. The authors write that:

> the public's perception on the Internet of Things is mostly positive for the period of our analysis (2009-2015). As they relate to the IoT, business and technology seem to be the main areas of interest. We also find that the public expresses concern about privacy and security associated with the IoT. Although we had access to

> billions of raw tweets, our analysis was challenged by the limited fraction of the tweets relevant to our study. Also the user demographics available on the social media platforms do not allow our results to be generalized to the general population. Finally, we found that the IoT was not as popular a tweeting topic as we expected, presumably because the social media platform is more popular for younger generations who may not have much interest in the technology business in general.

Perhaps what is most disappointing about this application of LDA topic modeling is not about its application at all, but rather about the disciplinary contextualization of it—and the acceptable conclusions that can be put forth within that context. All in all, one gets the general sense that this research, more than anything, constitutes a missed opportunity. The substantially smaller, although more rigorously theoretically grounded and specifically focused exercise I describe in the next section is intended to pick up where Bian et al left off. That is, it aims to identify latent topic structures within the broader concept of 'IoT' in much the same way as Bian et al, but it does so in a theoretically oriented way.

3.4.4 Data Collection and Cleansing

Unlike prior work regarding the discursive structure of IoT as it is represented in Twitter, the current project involved the purposeful scraping of Tweets occurring over a specifically chosen period of time. Such tweets were further limited to contributions indexed with one of three different hashtags. As a means of gaining access to the discourses comprising the IoT, between 11:41:11am, April 19, 2016 and 05:06:56pm April 22, 2016 tweets from Twitter were collected by means of an OpenSource, java-based scraping software.[99] These dates were chosen as a suitable period of time during which to scrape tweets pertaining to IoT because of the co-ocurrence of a major industry

[99] MyTwitterScraper.jar developed by Jason Dixon. https://sourceforge.net/projects/mytwitterscraper/

conference: IoT West, held in San Francisco, California. The scraper was set to collect all tweets containing the following indexing terms: "#iot"; "#internetofthings"; "#iotwest2016".[100] (As one might expect, the hashtag "iotwest" was the designated hashtag for all tweets related to the IoT West conference.) The scraping process resulted in the collection of 104,448 individual tweets and retweets.

In order to prepare the dataset for topic modeling, several cleansing procedures were undertaken. First, 54,231 retweets were removed from the data. The removal of these data points is justified by the exploratory nature of the analysis occurring at the discursive level. Because the goal of this analysis is to achieve a broad understanding of the general topics, or discourses, that scaffold the discussion of IoT as represented via a relatively brief snapshot of Twitter activity, it is not necessary to engage in an analysis of the network of users and their interactions, nor to confound the generalizability of the resultant topic model with the weight assigned to certain topics in a given, temporally bound window of activity. As such, only novel tweets were included in the dataset.

Once original tweets had been segregated from retweets, data was imported into a specialized, java-based data management software, DataCleanser.[101] This software was used to: first, transliterate all non-Latin characters to ASCII format; second, remove all symbols from the resulting ASCII text; third, remove all remaining non-alphanumeric characters through the implementation of regular expressions; and fourth, remove all partial strings beginning with whitespace and followed by a variant of "http*." This last step achieved the removal of URLs, the analysis of which is outside the scope of this project. (One can imagine a valuable critical discourse

[100] "#iotwest2016" was included in order to include tweets directly relevant to the Internet of Things Summit held by Innovation Enterprise in San Francisco during the period of April 21, 2016 and April 22, 2016 (inclusive).
[101] The free, OpenSource version of DataCleanser is available at: https://datacleaner.org/

analysis or content analysis of those website to which tweets in the dataset linked, but such an endeavor would be nothing short of Herculean.)

Following the portion of the cleaning process occurring in DataCleanser, which achieved a largely readable and standardized dataset, all remaining data were cleansed for non-English contents through the use of Google's "=detectlanguage" algorithm available in GoogleSheets. Once the data was present in this highly standardized format, non-English tweets were removed from the resulting *.csv file. This somewhat lengthy cleansing process resulted in a remaining corpus of 23,647 tweets (hereafter "documents," "data," "tweets") each containing unique, non-duplicative textual material.

3.4.5 Topic Models from Tweets

Multiple topic models of the data were generated using two versions of the Mallet software developed at University of Massachusetts, Amherst. The first version is the historical first, command-line instantiation: Mallet 2.0.8RC3; the second is Topic Modeling Tool (TMT), a simplistic, GUI-based version of Mallet developed by the University of Michigan and the University of California, Irvine. Initial topic models were created using TMT, but were largely discarded because of the software's limited configurability. However, initial familiarity with the topic modeling process was gained through interaction with TMT.

Following the conclusion that topics derived from the use of TMT were not optimally useful or sufficiently nuanced to result in insightful interpretations, I turned to the use of the MALLET toolkit, originally developed at University of Massachusetts Amherst. MALLET

presented as a better alternative to TMT because of the increased control over the LDA process provided the user.

For the purposes of transparency, I provide the full list of MALLET command line instructions, along with simplistic explanatory annotations, used in the analysis of my dataset here:

```
--input /Users/sebergerj/Desktop/05202016/TweetsNoIoT.mallet
--num-topics 10
--num-top-words 20
--num-iterations 500
--doc-topics-threshold 0.05
--optimize-interval 20
--output-state /Users/sebergerj/Desktop/05202016/Twitter.gz
--output-topic-keys /Users/sebergerj/Desktop/05202016/keys.txt
--output-doc-topics /Users/sebergerj/Desktop/05202016/composition.txt
--word-topic-counts-file /Users/sebergerj/Desktop/05202016/topic-counts.txt
```

The first command, '—input…' instructs MALLET to load a particular file. In this case, that file is 'TweetsNoIoT.mallet.' This refers to the full and cleaned (as per the description above) set of tweets scraped from Twitter during the specific period of time. The second command, '—num-topics 10' shapes the LDA algorithm executed by MALLET to limit the number of topics to ten. As noted earlier, the decision to limit topics to ten was born of trial and error, as per the heuristics provided in DH literature described above. This choice is also in line with the directions found in the MALLET user manual:

> The best number depends on what you are looking for in the model. The default (10) will provide a broad overview of the contents of the corpus. The number of topics should depend on some degree to the size of the collection, but 200 to 400 will produce reasonable fine-grained results (MALLET User Manual, http://mallet.cs.umass.edu/topics.php).

This deserves further explication due to the variance in suggested topic number. The corpus treated in this particular model is not large enough to warrant a model comprised of, say, 200 topics; nor is the exploratory goal of the analysis. If, as I argue, topics represent glimpses of the

discourses that underlie the statements present in a given corpus, then the topics that one models should be somewhat broad. That is, they should be open-ended to a certain extent, judged by the human interpreter, as to possible represent a discourse, or set of semantic constellations that will shed light onto the historical roots of the discourses present in the corpus. That the number of topics chosen (ten) is also the default setting of MALLET is purely coincidental. As described above, multiple models were generated with sets of topics that ranged from five to fifty.

The third command, '—num-top-words 20' limited the number of terms that appear in each topic to twenty. A similar process of trial and error resulted in the decision to limit topics to twenty words—topics with a higher number of words were of limited value to the reader, while topics with fewer than twenty words did not provide suitable room for exploratory interpretation (see Rhody, 2013).

The fourth command, '—num-iterations 500' is slightly more complicated than the previous commands. It shapes the algorithm such that each the full text comprising the corpus is sampled five hundred times in the process of generating the specified ten topics consisting of twenty terms each. The MALLET User Guide suggests that "the number of sampling iterations should be a trade off between the time taken to complete the sampling and the quality of the topic model' (http://mallet.cs.umass.edu/topics.php). Given that the corpus in question is rather small compared to say, the ECCO database or other such databases that might be subject to LDA analysis, the time required to perform sampling iterations was not a major concern. (Models with as many as 2000 iterations were completed in only a matter of seconds.) However, while developing models through a process of trial and error, I found that models generated with greater than 500 iterations bore no significant difference to those developed using 500 iterations. The converse, however, is untrue:

models developed with fewer than 500 iterations lacked necessary specificity—the topics did not appear to have the same nuance, and therefore ground for meaningful or challenging interpretation.

The fifth command, '—doc-topics-threshold 0.05' shapes the algorithm such that the threshold proportion of a given topic relative to the text is greater than or equal to .05. (Common settings are 0.1 and 0.05.) Put differently, a topic generated by the model is seen to be valid, and therefore included in the finalized, iterated topic model, if its occurrence in the textual corpus is above the threshold of 0.05, where any topics whose occurrence falls below that mark are not included. The literature suggests that higher document-topic-thresholds (i.e., 0.1) should be used with smaller corpus sizes. However, this instruction is somewhat misleading, given that the theoretical foundations for using LDA are not homogeneous. That is, different scholars use LDA for different ends. Given that my goal in using LDA is to identify topics of sufficient breadth, but also sufficient specificity as to represent discourses, I found that using the lower threshold of 0.05 was effective—the topics generated through this model gave sufficient interpretive breathing room.

The sixth command, '—optimize-interval 20' allows for the weighting of certain topics more than others. That is, this command 'turns on hyperperameter optimization, which allows the model to better fit the data by allowing some topics to be more prominent than others' (http://mallet.cs.umass.edu/topics.php). The remaining commands provided above dictate the format of MALLET outputs. That is, '*.gz' or '*.txt'. It should be noted that .gz files are particular to MALLET. With this explication of the LDA algorithm's construction out of the way, it is now time to turn to the 'wet work,' so to speak: the analysis and interpretation of the topics that it generated.

3.5 Abductive Analysis and Speculative Deduction

Through the methodologies described above, I will identity the discourses active in the construction and evolution of the imaginary of IoT—its potential futures. Such an identification moves the dissertation into a present tense. In order to begin answering the question, 'What will the experience of being human in a future characterized by IoT mean?' we must move from the present into the future. I effect such a move through abductive analysis and speculative deduction.

My approach to abductive analysis is unusual because it does not take place in the context of the scientific method. Over the course of his career, Charles Sanders Pierce worked with no fewer than three concepts of abduction (Fann, 1963). For Pierce, abduction is the set of logical processes by which hypotheses are derived; the process by which hypotheses are deemed worthy of investigation. It exists as a complementary form of inference to deduction and induction. Whereas inductive logic works to fail to disprove a given hypothesis, abductive reasoning takes place prior to the formulation of an hypothesis: it is the means by which an hypothesis is generated.

This treatment of logics is presented through Pierce's own, relatively idiosyncratic taxonomy of logics in which inference comprises the parent category. This parent category is divided into two lower classes: explicative and ampliative. Explicative inference includes both analytic and deductive logic; ampliative inference, also referred to as synthetic inference, includes the process of induction. For Pierce, it also includes the inferential processes of abduction (Fann, 1963, p.7).

The following logic, presented by Pierce, illustrates the basics of abduction:

> The surprising fact C is observed,
> But if A were true, C would be a matter of course;
> Hence, there is a reason to suspect that A is true.
> (Pierce, as quoted in Fann, 1963, p.8).

This particular formulation of logic suits the present project in two ways. First, it describes the motivation for the project. In Chapter Two, I demonstrated that there is relatively little scholarly work that directly concerns the human in terms of IoT. Such a finding constitutes a 'surprising fact.' The surprising fact that humans are left out of the scholarly discourse pertaining to IoT leads one down a path of questioning. Why is this the case?

Consideration of this question ultimately resulted in the following supposition: if it were true that 'the human' as discourse was inextricably bound to the discourse of 'the thing,' then the apparent exclusion of 'the human' from scholarly discourse about IoT would be a matter of course. In the words of Pierce, 'Hence, there is a reason to suspect that [the discourses of 'the human' and 'the thing' are both implied by the term 'things' in IoT] is true.' As was demonstrated in the final sections of Chapter Two, this supposition bears out. In the absence of the human, a subject, a thing ceases to be: rather its 'thingness' is aborted, and it fails to rise from the category of an object.

The second way in which Pierce's description of abduction is relevant to the present project is the temporality it implies. The act of testing C in terms of A is a future-oriented act. As such, there is reason to suspect that abductive analysis might be useful in forecasting potential discursive transformations that will both occur because of and give rise to the future of IoT. But, given that Pierce's use of abduction occurs solely within the scientific method—the production of a testable hypothesis—some logical gymnastics are required to produce a form of abductive inference that will remain useful to a project that is emphatically not a scientific one. This occurs in a reframing of the original (stated above) relationship between 'the thing' and 'the human.' Such a reframing

must question the directionality of the relationship: does the thing come first or does the human? Or is it a bidirectional relationship?

In that 'the human' and 'the thing' are bound up in the same constellation of discourses—or they are, indeed, the same discourse—the relationship between the two potentially falsely dichotomous concepts of 'thing' and 'human' becomes bidirectional, but only insofar as the dichotomy of 'things' and 'human' is sustained for the purposes of analysis. If the discourses of 'the thing' and 'the human' are, in fact, one and the same, then the directionality of their relationship is not directional at all, but rather an encased feedback loop: Ouroboric.

This, then, constitutes another surprising fact, or potential fact: the human and the thing are not mutually exclusive, but rather constitute the same discourse. Shifting from abduction to deduction, this would mean that any transformation affecting the discourse of 'the human' would also be a transformation affecting the discourse of 'the thing,' and vice versa. This inference leads us to an interesting point: we are applying deduction to a speculation. The speculation is: 'the thing' and 'the human' are two discursive sets, but that there is such significant overlap between the two sets (i.e., shared membership) that they are functionally the same. This speculation, then, becomes a given: if this speculation is taken as a given, then to deduce from it is to engage in speculative deduction.

Speculative deduction can be formalized in the following way:

> X is an abduce-able inference;
> Hence, there is sufficient evidence to suspect that X is true;
> *In the case that* X is true, then phenomena subject to the rules of X must be interpreted as such.

.

That 'the thing' and 'the human' are, in fact the same discourse, is abduce-able based on the critical literature review presented in Chapter Two; this means that there is sufficient evidence to

suspect that the 'Internet of Things' is always already as much about 'things' as it is about 'humans,' which therefore means that the dichotomy of 'humans' and 'things' is a potentially false dichotomy. In this light, then, the formerly separate ontological categories of people and things need to be interpreted as subject to the same set of rules: those that govern the greater discourse of {(the thing) AND (the human)}. This is nothing short of a fundamental ontological transformation. What remains to be seen is the directionality of this transformation: that is, which extant ontological category, the 'thing' with all of its object-connotations or 'the human' with all of its subject-connotations, will win the rhetorical battle for metaphorical primacy? Will we see this potential ontological category of {(the thing) AND (the human)} in terms of its object qualities or its subject qualities?

These questions should be reinterpreted in terms of the original question that guides this work: What might it mean to be a human in a world where IoT is realized? Are we becoming more like objects through our coupling with them to produce 'things'? Or are objects becoming more like us by the same process?

These are very large questions. So large, in fact, that they may seem unanswerable. But the present research is inherently exploratory. Grand questions are to be expected. The scope of these questions also evidences the usefulness of abductive analysis. To demonstrate, I turn to Tavory and Timmermans' (Tavory & Timmermans, 2009, 2013, 2014; Timmermans & Tavory, 2012) description of abductive analysis.

Tavory and Timmermans position their own particular version of abductive analysis in terms of its relationship to traditional modes of sociotechnical research: grounded theory and the extended case method. In doing so, they highlight the value added to the research process by the

use of abductive analysis, not the least of which is abductive analysis' openness to extant theories. This openness is key to the current project.

The domains into which IoT extends—the humanities and arts, computer science, information science, the social sciences—are already populated with the work of great thinkers and scholars, working more frequently by way of incremental steps than by way of theoretical leaps. There's just too much out there to overlook outright, to push aside as one might do in the Grounded Theory approach. That is, grounded Theory, as a means of constructing a bespoke theoretical armature explaining a given and well-defined set of data, appears as inappropriate. Why would anyone given the opportunity to spend years cultivating deep and broad familiarities with extant theories of the social, the psychological, and the technical, choose to set such familiarity aside? Such an approach seems to me absurd.

This characterization of Grounded Theory might seem too harsh, particularly to practitioners of the Grounded Theory method. But one finds support for it even in the professional divergence of its two progenitors: Glaser and Strauss. To set aside the extant work of theorists whose contributions might adequately be applied to a novel phenomenon (or set of phenomena) is, then, absurd. It alienates a given circumstance from others; it alienates the world as it observed from the world as it was observed.

In the face of such absurdity, then, another approach must be chosen. As Tavory and Timmermans suggest, the Extended Case Method initially appears as good a candidate as any for the development of new theory. Admittedly, this is an approach to which I find myself drawn. The popular musician Tom Petty once quipped that if, when starting out as a songwriter, you're not stealing from another songwriter, then you're doing something wrong. The sentiment of the statement is also echoed in a more widely known aphorism: imitation is the sincerest form of

flattery. In learning to become a theorist, a process informed by my own experiences of learning to be a musician, it is tempting to settle on the work of one theorist and run with it—to act as a practical proponent of a pet theory or theorist by way of working solely through the lens they created.

It is tempting for me to work my way through an analysis of IoT via media theory, deconstruction in the vein of Derrida, documental analysis of Lisa Gitelman and Cornelia Vismann, Ron Day, or Michael Buckland, the actor-network theory of Latour, Callon and Law, the infrastructure studies of Bowker and Star, the distant reading method of Franco Moretti, content analysis (writ large), the ecological psychology of Gibson and Chemero, or even the hermeneutics of Ricoeur. But any of these approaches, and indeed all such 'pet theory' approaches fall prey to a similar kind of criticism just leveled against Grounded Theory: although the Extended Case Method chiefly differs from Grounded Theory in its reliance on and application of extant theory (e.g., it is deductive rather than inductive), it suffers from a form of theoretical myopia functionally equivalent to that of Grounded Theory.

Whereas Grounded Theory can effectively be criticized for creating a new theory that bears little genealogical relation to previous theories, the Extended Case Method eschews the creativity of theory generation for the continuation of an extant theory. If one is to approach an understanding of a phenomenon or set of phenomena as disciplinarily complicated as IoT, then neither of these approaches will suffice. The former (GT) would risk cutting off IoT from the theories pertaining to the discourses and phenomena that have historically allowed for its rise; the latter would relegate IoT to the realm of the non-novel, indicating that it can already be explained via the lens of one extant theory or another. But, still, these approaches are simply too rich, too pregnant with analytical potential, to overlook entirely. It is primarily for this reason that I have chosen to frame

my work with the method of abductive analysis. It is what might be called a 'happy medium' between Grounded Theory and the Extended Case method.

The use of abductive analysis, particularly as it applies to the generation of theoretical rules which, in turn, lead to engagement with speculative deduction, allows for the consultation of extant deductions, as well as extant inductions. That is: abductive analysis allows for the possibility that while all aspects of every previous theoretical finding or empirical observation leading to a theory might not be correct or suitable for the current project, some of them might be. Abductive analysis presents as a form of theory generation that does not necessitate throwing the baby out with the bathwater.

If we have arrived at the present tense of the Internet of Things, of being human where humanity is inextricably interwoven with 'things,' then it is impossible to rule out the possibility that we have arrived here through the effects of certain theories, certain empirical investigations that may only be partly correct. To engage in an analysis of the discourses active in IoT, as well as the composition of those discourses, while turning a blind eye to the theories and investigations that brought us to this point would be to prematurely wall off the future from the history of concepts, from intellectual history. If IoT is to be interpreted in terms of the social imaginary and the archive, this simply cannot be the approach we choose to take in seriousness.

In this chapter, I have outlined my methodological approach. It is now time to enter the data-driven portion of this dissertation. That is, we enter now the archive of IoT as it manifests in the present tense so as to look forward, to forecast, the futures of 'the human' as they reside within the futures of the Internet of Things.

Part II

As you read this, you are surrounded by objects. If you're reading in a familiar environment, say your office, then you are likely at a desk. That desk probably has a computer of some form on it—some configuration of monitor, keyboard, and mouse; input(s) and output(s). There's also probably some kind of lamp, some shelves, some books, maybe a set of speakers or some small collection of doodads that give visitors an immediate sense of who you are.[102]

If you're reading this at home or in a coffeeshop, the set of objects that surround you is no less predictable. Perhaps there are more photos in your home, a more comfortable chair (perhaps a couch), a television set, a kitchen counter. A coffeeshop: tables, ceiling lamps, maybe a fireplace, and the objects of others. In any scenario, the objects that populate the space you are in partly define who you are within that space.

If, as I have already begun to argue, the discourses of 'the thing' and 'the human' are intertwined, and the 'thing' is created through the coupling of a subject and an object, and possibly *a subject* with ***n*** objects or ***i*** subjects with an object, then you and the objects in your current environment form a highly configurable, but functionally limited, set of 'things'—proto-events born of realized affordances arising between subject and object. The inverse of this logic means that your office is part of you: the things that it contains are part of 'the human' that you are.

The subject-object coupling of you and your desk forms a thing as defined by the actionable qualities that arise between your characteristics and the desk's. (It is a thing for sitting at, working at, writing upon, leaning on.) Similarly, and if we are willing to explore multiple categories of couplings from which things are derived, then your office might be considered a thing unto itself: an object-stand-in for various subjects or subjective forces (e.g., institutions, bureaucracies,

[102] I once worked for a corporate attorney who decorated his office with pictures of himself standing near or shaking hands with famous or powerful people. He had a wife, an ex-wife, and a few kids between the two, all of whom were conspicuously absent. Pictures are worth a thousand words.

governments) containing objects, each of which present in their own individually possessed characteristics possible forms of coupling with you, their user-subject.

It is possible to envision 'a human' as operationalizable solely in terms of the actions that may or may not be taken through and by means of the total set of objects with which they interact and couple. We cannot be what we do not have access to: our interests, our hobbies, our worldviews are dependent on the objects that surround us, that become part of us through their integration with our actions, our possible actions. The realm of 'the human,' then expands and contracts along with the realm of 'the thing:' a change in the objects with which we couple to produce 'things' results in a change in 'the human.'

In this section of the dissertation, I focus on the experiential placeness of things as a means by which to focus on the discursive structure of 'the human.' That is, I focus on the thing in the wild, where the wild is the world of our contemporary historical *a priori*, our archive as rendered accessible through the social imaginary and always already comprised of (coupling/coupled) subject and objects.[103]

While the 'thing' in question will always be discussed, at least indirectly, in the context of the Internet of Things—a moving point at which subject-user, sensor-imbued object, and network meet, thus potentially changing the prematurely bifurcated discourses of 'the human' and 'the thing'—as I pointed out in Chapter Two, the semantic content of 'things' in IoT is almost wholly overshadowed by the term, 'Internet.' If we are to begin to develop a meaningful—and by that I mean sufficiently transdisciplinary and humanistic (but emphatically not 'posthumanist')—

[103] In referring to 'our historical *a priori*,' I do not wish to imply that *my* particular relationship to the current historical *a priori* condition is universal: we are certainly not all white, cis-gendered, Western, thirty-somethings living in Southern California. The experience and construction of the world differs in beautiful ways across cultures, embodiments, and societies—I do not intend to deny this or attempt to homogenize experience. I do, however, wish to imply that within the current historical *a priori*—one that encompasses each of the aforementioned conditions—there is room for myriad identities as they arise across myriad cultures. This is not a reductionist statement, but an expansive one: technology touches upon them all.

concept of IoT, then we are obligated to delve into the messy, always already mediated (and mediating) realm of the 'thing' as it exists outside *and* inside the notion of IoT.

I now build on the introductory discussion of 'things' provided in Chapter Two by situating it in the observable world. In doing so, I dive deeper into the realm of 'things' through further theorization and empirical analysis—but an analysis that is always colored by the primacy of the existential (and absurd) and phenomenological.

As I will demonstrate in Chapters Four and Five, things—ever present before and after the Internet—occur and manifest through their coupling with individual subjects and groups of subjects, at remarkably variable levels of scale. In so doing, they comprise the human at various levels of scale: they define the human in multiple facets. And this is key: the human is scalable. Scalable across temporalities; across situations; across ecologies and environments both social and cultural, both historical and imagined. In terms of embodiment, these levels range upward from that of the body to the home to the city to the nation and, indeed, to the broadest reaches of formalized knowledge production and control.

All of these efforts and discussions are undertaken in order to build a baseline understanding of just what the social imaginary of IoT looks like—of what 'things' are made, and therefore into what they might be 'remixed' in a sense as archival as it is artistic (Lessig, 2008)—of what the present tense face(s) of the human archive point(s) to, of what discourses it is comprised and what possible discursive transformations it allows. The findings later presented in these chapters will take the form of discursive identifications, which in turn, will provide the basis for the speculative deduction of possible discursive transformations that are made possible through the rise of IoT, the task to which I devote the third section of this dissertation.

Your objects, those with which you choose to populate your environments, or those that are chosen for you as in the form of water coolers, fluorescents, and cubby-hole mailboxes of professional settings, (or, indeed, the sidewalks, street lamps, and palm trees of your neighborhood), in their habitual proximity to you, co-constitute *you*—constitute the 'you' that extends beyond the walls and temporal mirrors of your own experience and movie-theater eyes into the categories of social situations in which you find yourself. They bound and guide you—'nudge' to borrow a term from Thaler and Sunstein (Thaler & Sunstein, 2009)—across categorically different sections of your life: the professional, the personal; the glossy and the intimate; the silent and the gregarious. They bear part of the lode of identity, of personality whether one chooses to view this construct from either a state or trait vantage (Funder & Ozer, 2004; Pervin & John, 1999; Sharp, 1987).

To put a finer point on it: in surrounding you—co-constituting in concert with you the environment in which you reside—things play an active role, reflecting your own agency by their very thingness, in deciding what actions can be taken in a given situation. When these things are seen in terms of their archival history, they exert power, form with you the discursive content of the contemporary human archive, ripe as it is for inscription, reinscription and palimpsest-like erasure—an erasure that is more an obfuscation than pure erasure.[104] They are part and parcel with the environmental constraints that guide what is possible and is not possible in a given situation, not unlike the rigid structures of sestinas and sonnets (Strand & Boland, 2001): one acts within the set of possibilities afforded between oneself and actionable rules of the objects that surround and envelope, to perform the poetics of experience.

[104] This argument is not unlike the one that subtends the weight of Actor-Network Theory, but it arises less from a sociology of actants than from an ecological psychology (J. J. Gibson, 2014; Lombardo, 2017) and media theorization of environments (Peters, 2015b).

This need not be interpreted as a purely deterministic, practical statement wherein all actions via the objects in our environments are addressed to the worlds outside our cerebral eggshells.[105] Actions by means of objects can just as readily be directed inward, a case that further highlights the role of the thing—the affordances arising between subjective perceiver and objective perceived—in maintaining identity. (One thinks of Linus Van Pelt, fully grown, and longing for the sweetness of his childhood's security blanket…) This 'identity' not only includes one's personal or group identity, but also a much larger categorical identity: that of the (Western) human extant in the first quarter of the twenty-first century: the human in their particular historical *a priori*, their own particular corner of the greater archive.

Having already turned our attention to scholarly notions of the 'thing' and the 'Internet of Things,' I now move the discussion from the controlled man-behind-the-curtain realm of laboratories and universities, into the world of the text (the world-as-text *à la* D.F. McKenzie [D. F. McKenzie, 1999; Donald Francis McKenzie, McDonald, & Suarez, 2002]). Given the relatively narrow operationalization of IoT as provided by scholarly work, we must now zoom out into the messier realm of the social imaginary: 'the thing' and 'the human' as they co-constitute one another in the lived and mundane world. As an entry to this mundane world, I begin by considering the role of things in literature.

Things are everywhere in literature. No one has made this point more convincingly than Bill Brown in his series of articles and books pertaining to 'thing theory' (Brown, 2001, 2004, 2010, 2016). In these works, Brown focuses on the role of certain objects in canonical works of art and

[105] Indeed, at times my arguments will tend towards theories of direct perception, rather than the deeply engrained Cartesian notions of representationalism (Wagner, 1993) and indirect perception (Lowe, 1981) wherein an impermeable, permanent divide between subject and object creates a ubiquitously accepted dialectic.

literature. Here, however, I attempt to further his lines of argument by considering not canonical works, but less revered works (still, however, active in constituting a social imaginary—mine, at least). I also expand discussion of the thing in literature to include the nascent theory of things—of couplings between subjects and objects predicated on complementary characteristics—currently under development in this work. In an effort to illustrate the personal nature of things, I direct the reader first to a short work by the Scandinavian artist and designer, Margareta Magnusson: "The Gentle Art of Swedish Death Cleaning" (Magnusson, 2018).[106]

In this pleasant memoir disguised as a self-help guide, the author declares that her 'vice is really things: […] Beautiful things such as an African wooden bird, strange things like a signing magnetic pig, and funny things like a solar-powered waving bear' (Magnusson, 2018, p. 62). In exploring the role of the thing in the experience of being human, she goes on to suggest that such things as those in which the owner takes great pleasure make ideal gifts for dinner party hosts or close friends: 'If you are invited to lunch, don't buy the host flowers or a new present—give her one of your things' (p. 62). Although such a course of action, if habitualized, would likely not endear any guest to many American hosts, this suggestion alludes to the deeply personal nature of our objects: in coupling with them, in either an outwardly active manner or an inwardly reflective one, we define ourselves through them. They serve as reminders of ourselves, of load-bearing existential infrastructures for the narratives we use to bound our identities, to trigger or house memories.

In my own case, I think of a bartender I knew in Paris who, being an avid reader, wanted to exchange books with me. I had recently purchased a Don Delillo novel at Shakespeare & Co. and

[106] This particular work is part of a growing trend of 'self-help' books intended to aid the reader in decluttering their homes. The presence of this trend, itself, highlights a changing relationship between the human and the objects they accumulate.

had been singing its praises, which spurred her suggestion: “I’d love to read it. Why don’t you give me your copy and I’ll give you one I just read,” or something to that effect. I’ll admit that I couldn’t part with the Delillo because doing so felt like I would be parting with a potential memory: a tangible symbol of a day spent smoking strong cigarettes next to the Seine and reading. I bought a new copy and gave it to her. Her face betrayed clear disappointment. The pain and pleasure of giving and receiving certain things betrays their existential importance just as much as Casi’s face betrayed her disgust at receiving an object of little value to me.

As additional anecdotal evidence for the role of ‘things’ in defining ourselves, but in this instance defining ourselves through our emotional states, consider the Danish notion of *hygge*. There is no direct translation of this term in English, though one might think of it as hominess or a slightly more socially-minded and ritualistic version of ‘cozy.’ The term is given in-depth treatment, albeit in a ‘lifestyle- or self-help-prescriptive way, by the Danish author and happiness researcher, Meik Wiking (2016).

In his short bestseller, ‘The Little Book of Hygge,’ Wiking illustrates the role that certain objects play in the production not only of personal emotional states, but in terms of national or cultural identity. As he repeats frequently, candles are important, as are fireplaces, scarves, wool socks, and tea. According to the author, the essence of a cultural phenomenon that ultimately refers to one’s relationship with oneself or one’s relationship with a close-knit, small group of friends or family members, can be boiled down to the effect that a constellation of objects has on the environment in which one resides. Things not only bound the set of actions we might take in any given environment, but they also influence the experience of emotion. (From an aesthetic point of view, one recalls the studies of the relationship between paint color and affect [Elliot, Fairchild, & Franklin, 2015]. It turns out we probably should paint our walls puke green if we want to be calm!)

But the role of things in the maintenance and negotiation of identity is not solely relegated to the realm of self-help manuals. In the more literary realm, and with regard to the subtle role that things play in defining our characters (both fictional and lived-in), one thinks of poor Mrs. Clutter in Truman Capote's *In Cold Blood*: "'Little things really belong to you,' she said, folding the fan. 'They don't have to be left behind. You can carry them in a shoebox.' [….] 'And—it's important always to have with you something of your own. That's really yours.'" (Capote, 2001, pp. 27–28).

The little things to which the doomed Mrs. Clutter refers—including a tiny umbrella bought by the equally doomed Mr. Clutter on a trip to San Francisco, or the dollhouse-scale tea set received as a childhood gift—are things to be *had*, and in having to reflect a sense of control over one's (possibly) out-of-control life. In the case of these tiny objects, and contextualized by a character prone to 'fits' and bluntly diagnosed nervousness, the mere size of the objects is the objective aspect through which she performs part of her personality: in a life in which control is lost, it can be temporarily reasserted by the enveloping of the tiny object with the hand, the physical consideration of its size, and the notion that tiny objects need not be left behind—they can be controlled and therefore owned. In owning and controlling, Mrs. Clutter not only performs her own mental shortcomings, but in a reciprocal way, stabilizes them, concretizes them: in performing her identity through the control asserted over tiny objects, Mrs. Clutter simultaneously exercises a form of control not otherwise present in her adult life, but also binds herself in the role of the un-controlling, the meek, the nervous and broken.

Capote's Mrs. Clutter proves—more through the author's style, perhaps, than through her own qualities—to provide still further support for the identity-regulating role of things. One needs only look a few paragraphs into the unfolding narrative to see:

> The room she so seldom let was austere; had the bed been made, a visitor might have thought it permanently unoccupied. An oak bed, a walnut bureau, a bedside

> table—nothing else except lamps, one curtained window, and a picture of Jesus walking on the water. It was as though by keeping this room impersonal, by not importing her intimate belongings but leaving them mingled with those of her husband, she lessened the offense of not sharing his quarters (Capote, 2001, p.28)

The room in which Mrs. Clutter sleeps, a symbol of her mental fragility, defines her in a negative sense: not through the objects that are present, as in the case of her tiny umbrella, but through the objects that are absent. The bed, the bureau, the Mid-West-generic portrait of Jesus: these are what might be called standard objects, so devoid of personality as to approach the generic quality of the 'prototype' (Lakoff, 1999; Rosch, 1999; Rosch & (U.S.), 1978). In being generic—one might find these in a well-used hotel—they are conspicuously absent of specificity. They reflect the hollowness of Mrs. Clutter's shattered nerves, the echo of thunderous fits. In the absence of personal objects found in her sleeping quarters, one reciprocally sees the spread of her character across time and space in the presence of her personal objects still found in the marital bedroom: in the spatial divorce of Mrs. Clutter and her personal objects, the reader finds evidence of a fracture, of a co-constitution between subject and objects that is no longer possible. In her distance from her personal objects, Mrs. Clutter evidences a distance from herself.

Just as in the separation signified and performed through the dislocation of Mrs. Clutter and her objects, spread as they are across the two rooms that demonstrate different eras of her life—one of the marriage bed and one of the sick bed—objects define the realm of possible action not only by their positive affordances (i.e., what can be done), but also by the negative affordances that arise between subject and object (i.e., what cannot be done). Consider the role of a more plainly infrastructural category of objects: barriers.

A subtle treatment of the thing-as-barrier can be found in Heike Geissler's (2018) recently translated, second-person meditation on the experience of working in an Amazon warehouse entitled, 'Seasonal Associate':

> And now: things, oh boy, *things*. It's because of all the things that you are here, which someone or another wants to buy, and you're here in the first place. […P]roducts in your hands, for example this baseball cap that already looks so lived-in it could hardly get much more worn. Used- or distressed-look fashion, you get the point, but the cap is nothing but a ragged piece of cloth, more like something for adherents to a radicalized acceleration of the commodity cycle, people who only buy what has to be thrown away because it fails to meet its requirements as a usable product, serves only to move money and material. The cap has an Iron Maiden logo on it and has slipped out of its bag. You almost sense the greasy feel of sweat mixed with dust. You're tempted to try it on for a moment, perhaps because it looks like something you found on the street for which you might have some use. A colleague at the next desk calls over a guy was fired two weeks ago for trying out a skateboard he was supposed to be receiving. You nod, stuff the cap back in the bag, and tape it shut. (Geissler, 2018, p. 95-96).

In this excerpt, the reader is met with an unusual type of 'thing:' the type of thing that is not actually a thing because of what a subject might couple with it to achieve or enact, but rather because of the fact that the subject *cannot* couple with it in any meaningful way. This Iron Maiden baseball cap, so beat up and 'distressed' as to be almost nonfunctional, serves as a perspicuous example of things that cannot be things purely because of historical *a priori* conditions that severely limit the agency of the subject. Consumerism, rapid shipping, on-demand purchasing: all of these add up to a scenario in which the subject cannot couple with a given object for fear of reprisal.

For Geissler, you, as an Amazon warehouse worker, are something less than a true subject capable of full the range of 'thinging.' There are strict limits to the ways in which the subject, you, can interact with the objects around you. These limitations are not physical, but institutional. They

are imposed imperatives: wear that baseball cap and you will be fired despite the fact that you have a perfectly hat-suitable head.

So, it is not only the affordances that arise between a subject and object that lead to a potential thinging, but also the cultural or institutional context in which the dyad of subject and object meet that determines the possible emergence of a 'thing.' The subject-object relationship as determined by institutional or cultural characteristics and practices can, indeed, be a boundary that forbids the construction of a 'thing.' This type of subject-object relationship exists as a wall between the proto-thing and the thing itself: it is a membrane that is impassable but for certain negative consequences. Things are complicated.

Wherever you are—office, home, coffeeshop, train, airplane, but hopefully not a driver's seat—when you are reading this, there are almost certainly walls in sight. Walls are objects that figure prominently in everyday life. In a way, walls are perhaps the purest form of the thing: to be embodied in relation to them is to be always already subject to their limitations: we can't walk through walls.

Walls separate spaces. They provide closure and space, solitude or closeness. They compartmentalize and organize, function as physical analogs to the dialog-boxes that appear on bureaucratic forms or the uniform shipping containers that organize and standardize the transnational shipping industry (Klose, 2015). Walls are constant and omnipresent reminders and reassurances that the world is organized.

In social scenarios, walls provide the physical basis for in-groups and out-groups both in terms of status, exclusivity or inclusivity and safety. One thinks of the wooden walls built at Jamestown to keep the hostile natives at bay, or the fictional walls of Mycroft Holmes' Diogenes Club that

separated only the most aloof of members from the more gregarious and dirty society of Victorian London. For the twentieth century American psychologist, Abraham Maslow, the importance of safety and the shelter that walls and wall-like structures (i.e., roofs) provide was second only to physiological needs in terms of his famous Hierarchy of Needs (1943). Without shelter, there is little chance of achieving self-actualization according to Maslow.[107]

Walls are load-bearing in not only a physical, architectural sense, but also in a societal and cultural sense. They are the lowliest of infrastructures as highlighted by the desire to cover them, to decorate, to live a human life in terms of them. They are the substrate on which we inscribe, via screws, the pictorial stories of our lives, posters, calendars, reminders.

But walls also carry with them a more negative connotation. They are the devices of imprisonment, of forced isolation either from one's 'true' self (metaphorically) or from a society writ large. Pink Floyd's 'The Wall' comes to mind—from the question 'Mother should I build the wall?' to the final lyrics of the penultimate track, 'The Trial,' "Since, my friend, you have revealed your deepest fear, I sentence you to be exposed before your peers. Tear down the wall!" to the album's final lyrical content: "It's not easy banging your heart against some mad bugger's wall" (Pink Floyd, 1979). So, too, come to mind the Berlin Wall and the resonances of a former movie star's 'Mr. Gorbachev, tear down this wall!,' and sputum stained walls of the holding cells at the Long Beach Police Station and the muffled resonances of an apartment neighbor's first-person shooter sound effects. In both literal and figurative senses, walls are double-sided.

In either the positive or the negative sense of walls—and indeed in every shade of grey plaster and pink insulation between—they are generally not thought of as active. That is, they are *just* walls. Their activity is so ubiquitous as to render them conceptually invisible: they are the noise

[107] For those of us unburdened by degrees in psychology, one might think of self-actualization as the ability to reach one's full potential: to become one's true self as defined by aspirations.

against which the signals of our lives resonates. They stand there and carry, contain small spaces between spaces, they support the ceiling. They divide your space from everyone else's or place you in someone else's controlled space. They might settle over time or shake during a quake, teem with the life of a wolf spider infestation in rural Ohio or the ever-present cockroaches of California apartment living, but the extent of their action or mobility doesn't generally rise above the noise to the status of signal in mundane situations: they just stand there, encasing doors and windows, holding pictures and screens. But this does not mean that they are permanently, categorically relegated to the realms of the inert, the forgettable in the social imaginary. Walls are very definitely things. A late 1960s Chicago Blues track will illustrate.

In 1969 the Chicago Blues guitarist, singer and producer, Little Milton recorded a track called, 'If Walls Could Talk' (1970). It was released as a single in 1970 on the Chess Records imprint, Checker. The composition of the track is attributed to Bobby Miller, a producer for the Chicago-based Chess Records and the Detroit- and, later, Los Angeles-based Motown records. After a recording of the track was release by Little Milton, a few different artists recorded and published renditions of the track, thus entering it into the canon of American blues music. My personal favorite is recorded by Ry Cooder on his 1974 'Paradise and Lunch' release (Cooder, 1974). The general format of the lyrics included in the Cooder version are as follows:

> Well, if things could talk then I'm sure you'd hear
> A lot of things to make you cry my dear
> Ain't you glad (Ain't you glad)
> Oh, ain't you glad (Ain't you glad)
> Glad that things don't talk

Subsequent verses address the possibility of shoes talking ('When you say you've been visiting a friend'), doors talking ('If doors could tell who's turned the knob / when he's away out on his

job) and cars talking (‘If cars could tell who’s been inside / And who’s been taking you out for a ride). Miller by way of Milton and Cooder, closes his meditation on the silence of things with the following:

> If things ever told on me
> My whole life would be through
> ‘Cause I’m guilty how about you?
> If things ever talk that way
> Ain’t no telling what they might say
> Ain’t you glad (Ain’t you glad)
> Oh, ain’t you glad (Ain’t you glad)
> Glad that things don’t talk

That ‘walls’ are not specifically included in a song entitled ‘If Walls Could Talk’ is telling—it ‘talks’ more loudly in its silence than the objects the song describes. In the Cooder version, walls ostensibly represent the container of these other objects. But more than that, they signify what Herbert Simon (1996) has previously defined as the ‘artificial’ in both object and custom: in serving as the container of these other things, these doorknobs, cars, and shoes, they signify the silent relationship between subject and object in constructing or constituting the ‘thing.’ Walls signify an ‘always already’ condition of cultural-historical infrastructures in which potential subject-object relationships take place. In both physical and conceptual senses, walls constitute load-bearing entities (de Bolla, 2009, 2013; de Bolla, Peter, 2013) that subtend the structures of our contemporary historical *a priori*: walls, like entries in the encyclopedia, form categories.

In existing as barriers between two spaces, walls also provide the possibility for duplicity: they allow for the segregation of truth and fiction and for an individual subject to straddle the line dividing those categories. Although the focal point of, ‘If Walls Could Talk,’ is on romantic infidelity, through the enveloping of everyday objects like shoes, cars, and doorknobs into the

broader signifier-category of 'walls,' the lyrics can be read to ask a much broader and deeply relevant question: 'What would happen if the silent, objective, inert witnesses of our daily lives were no longer silent? Or, if they remained audibly silent, bore witness nonetheless?'

But one need not hear the noise of communication to fear the interlocutor. Perhaps not an interlocutor who verbalizes, but one who interjects through action or collection, through the muddling of plans, or the confounding of one's sense made of the world. Interlocutors complicate. So, too, do objects that imply possible interlocutors.

I turn to the narrative provided by Nabokov's Humbert Humbert in Lolita (2010) to illustrate:

> I felt instinctively that toilets—as also telephones—happened to be, for reasons unfathomable, the points where my destiny was liable to catch. We all have such fateful objects—it may be a recurrent landscape in one case, a number in another—carefully chosen by the gods to attract events of special significance for us: here shall John always stumble; there shall Jane's heart always break (Nabokov, 2010, p.211).

Poor Humbert. (Poorer Dolores on the Dotted Line…) To be so threatened by the very objects of civilization! But despite his attempt to blame the gods, to blame something like fate and therefore lessen his own burden in the construction of an obsessive and deranged psyche, there is something to this notion of bathrooms and telephones.

This something has to do with third parties and the unseen, the private. Within the privacy of the public privy's closed door, a potential gathering of the fairer sex (as would so surely terrify and disgust H.H.) signifies his betrayal, the conceit of his carefully constructed world of juvenile rape; within, too, the silenced other end of a telephone conversation, Humbert finds fear—the fear of the uncontrollable and the unknown. But, more than that, the telephone in its dormant state evokes uneasiness: it is, as an object on a wall, in a booth at a candy store, a waiting interlocutor. It is a portal from one place to another, connected by the cables of voice, that provides unwanted

entry into an otherwise cozy and secure situation: it is a point of entry for possible unknown subjects ready to ruin and save the terrible dyad he has formed with Lo, the thing that he and Lo constitute.

Just as much as Cooder wondered what might happen if objects spoke, Humbert Humbert feared the possibility that others will speak as interlocutors *through* certain objects and thereby transform the 'thing' he has constructed via Lolita. We might (reluctantly) take a lesson from Humbert's paranoid worldview: with certain objects comes the possibility of additional subjects that interact with them, that invade through their use of the bathroom or the telephone, your own relationship with that object. In so doing, those subjects are put in a position of power—a power to impact and influence your own little world. Given that IoT is predicated on connectivity, this form of interlocution deserves to remain in the foreground of our treatment of IoT. Although, like Bruce Sterling (Sterling quoted in Burnham, 2016), I am not predisposed to frame interlocution in terms of privacy. To do so would be to unreasonably restrain potential discursive transformation via the shackles of another, already outdated and falsely-concretized discourse. Square pegs don't fit in triangular slots.

It is worth noting that objects imbued with active characteristics were already well-established in the contemporary imaginary of the 1960s. The Jetsons had aired for two seasons some seven years prior to the release of Cooder's 'If Walls Could Talk'; the robot had long been in the imaginary, with its roots stretching back from the golem to Frankenstein's monster, through the Czech word for 'forced labor' (*robota)* to chess-playing automata, to Worlds' Fairs smoking or speaking demonstrations (Bell, 2015, 2018); the introduction of caller-to-caller direct long distance calls had already diminished the sense of isolation that distance provided. The two-way wristwatch

of Dick Tracey (still refusing to die in its form or function by way of smart watches) had shown up in the funnies since the early 1930s.

In a Derridean fashion, one might argue that the visible or positive space created by the inertness of objects (i.e., their apparent lack of agency) gives rise to the possibility for their agency. The positive space of inertness begs the negative space of agency. That objects became over time routinely imagined as possibly more active could be seen to give rise to the condition within the social imaginary of the 1960s, and indeed of the early 21st century, that allows for or assumes the legitimacy of creating objects that 'talk' or that are somehow more agentic than normal objects: objects that are not mere objects; objects that strive through our own design to break the dichotomous ontological walls of 'subject' and 'object.'

Somewhere between these future visions of objects and the more literary visions that opened this introduction, we are confronted with an intermediary object, one that carries identity—at individual, social, cultural, and historical scales—alongside the inscriptions it carries: the book. Staring at its covers, its spine, the book may appear too obvious, discussion of its importance too 'on the nose.' But, the book-as-object has its own stories to tell beyond and alongside the stories of adventure, history, self-discovery, torment and research it may carry amidst those anatomical features. Two examples will illustrate: that of the lowly bookshelf and that of the personal library.

First the bookshelf. I do not expect every bookshelf in existence to match the prototypical, magnificent full-wall structures you might be thinking of, or even the bright blue book truck I had to buy for my apartment to temporarily solve the problem of limited shelving. Instead, I imagine the historicity of the bookshelf as a symbol as it appears in William Gibson's novel, Neuromancer (NB: it is worth nothing that Lydia Pyne has addressed some of these lines in her work

'Bookshelf,'(2016) but I quote Gibson directly because her analysis and choice of quotation leaves something to be desired):

> His offices were located in a warehouse behind Ninsei, part of which seemed to have been sparsely decorated, years before, with a random collection of European furniture, as though Deane had once intended to use the place as his home. Neo-Aztec bookcases gathered dust against one wall of the room where Case waited. A pair of bulbous Disney-styled table lamps perched awkwardly on a low Kandinsky-Look coffee table in scarlet-lacquered steel. A Dali clock hung on the wall between the bookcases, its distorted face sagging to the bare concrete floor (W. Gibson, 2000, p. 12).

The bookshelf sits there, highlighted by description, amidst the other objects in a room far-removed from the readership of the 1980s. And yet, there it is. Not only does it serve to ground the reader in the futuristic, steam-punk world that Gibson created, but it serves to situate the life of the protagonist in muddled binaries we have come to know in the early twenty-first century: the division between home life and work life in the form of an office that might have been intended as a home; past and present in the form of reproduced pieces of furniture or *objets* designed in fashions spanning thousands of years. That the humble bookshelf speaks to the owner's personal relationship with their designed environments is not apparent in Pyne's analysis, which leaves out the lines 'as though Deane had once intended to use the place as his home.' It is for this reason that I do not provide a direct citation to Pyne, but rather a reference to William Gibson. It is for this reason, too, that I believe such a relationship needs further explication.

Books—or at least words inscribed on a substrate—are age-old signifiers of narrative, or the hopeful durability of narrative. The narratives they contain or that are represented through inscription are not only historical—as in an untenable history devoid of subjectivity—but they are also deeply personal. Their personal qualities, however, do not extend solely to those of the author(s). Instead, as I will demonstrate through a brief reading of a piece by Walter Benjamin,

the received inscriptions that populate bookshelves speak of the personal qualities of the reader, too, who has inserted him- or herself into the narrative *as reader* and who has lived after that act of reading.

In a little-discussed piece by Benjamin (1969), entitled "Unpacking My Library: A Talk About Book Collecting,' the author provides an invaluable glimpse into the relationship one has with their collection of books.[108] Benjamin begins this piece with a friendly invitation: "I am unpacking my library. Yes, I am. The books are not yet on the shelves, not yet touched by the mild boredom of order. I cannot march up and down their ranks to pass them in review before a friendly audience" (Benjamin, 1969, p. 59). As though he expects the glazed eyes of grade school pupils, glazed at the site and weight of daunting organization, he alludes to the boredom of stodgy 'collecting,' and almost immediately moves beyond it: "what I am really concerned with is giving you some insight into the relationship of a book collector to his possessions, into collecting rather than a collection."

Always astute, Benjamin circumvents the staid and dusty assumptions about the function of books—that is, assumptions about the book as a material form, as something owned. He does not provide the reader with a laundry list of the rarest volumes in his collection, as a child might do with a set of baseball cards. Rather, he cuts to the quick: he discusses his library in terms of his life. His library is a reflection of his life, of his experiences. The volumes contained in his collection are memorial, relays into memories of what he has done, where he has been.

The act of collecting books, for Benjamin, is the act of collecting not only the narratives they contain, or the artisan knowledge of printing and binding embodied in their materials, but also the narratives to which they belong outside themselves. Each book in the collection, regardless of the

[108] For the purposes of shoring up any problems arising from the conceptual space between owning books and collecting books, I contend that the combination of 'bookshelf' and 'book' constitutes a collection—to have a place designed for housing a particular type of artifact is at least tentative evidence towards collection.

semantic content it bears in its inscribed form, harkens back to the moments in life when the book, the collection and acquisition of the book, overflowed into the greater narrative of Benjamin's own life:

> Now I am on the last half-emptied case and it is way past midnight. Other thoughts fill me than the ones I am talking about—not thoughts, but imagines, memories. Memories of the cities in which I found so many things: Riga, Naples, Munich, Danzig, Moscow, Florence, Basel; memories of Rosenthal's sumptuous rooms in Munich, of the Danzig Stockturm where the late Hans Rhaue was domiciled, of Sussengut's musty book cellar in North Berlin; memories of the rooms where these books had been housed, of my student's den in Munich, of my room in Bern, of the solitude of Iseltwald on the Lake of Brienz, and finally of my boyhood room, the former location of only four or five of the several thousand volumes that are piled up around me (Benjamin, 1969, p.67).

Benjamin throws the book into the realm of the object: the venerated object of one's accretion. These are objects that tell stories beyond those they contain, that stretch out spiderwebs to tie author to printer to seller to collector, resonating most clearly with the memories of the collector. (Perhaps the memories of other actants in the book's network resound as undertones or overtones—but this is more in the realm of the literary.) Through his loving description, one begins to see the object of the book not as a carrier of semantic inscriptions, but rather as a memorial dog-ear: each book in the collection is, itself, a folded page in the memory of the reader, marking the possibility of remembrance of entry into that least accessible archive of the mind, of experience, of the inner narrativity of one's life.

Where the book serves as memorial signpost, the memory serves as text. Where the memory serves as text, the meat and substance of the mind and body, all wrapped up in one to be lived through via the senses, serve as media. Where the personhood of the reader can be viewed as a form of media—and it must be for it is the root of the metaphors that describe us and reciprocally describe the sensorial prostheses we create—we find yet another inconvenient and exhilarating

breakdown of the subject/object dichotomy. We are left with memory and mind as media: a type of media that knows no parallel outside the body. One that can maintain multiple, simultaneous and even contradictory notions; one that can bend and flex across temporalities as no readable, externalized media can do. We are left, in the case of Benjamin and his books, with the breadth and breath of the affordances between subject-reader and object-book, where the reader reads himself through the act of recollection, of remembering. The subject extends to the object to be met by itself, its reflection and the *act of reflection*. Beyond its membership in the archives of knowledge and narrative, the dyad of reader and read belong to *the human archive*.

All these things, all those things. So many things. As I have argued in this introduction to Part II, the objects that comprise our environments also comprise us. They are not 'out there' and we are not 'in here.' We meet in the middle to produce things; in producing things, we produce ourselves. It is the act of thinging that gives us our humanity: we experience emotion through things; we develop worldviews through things; we protect ourselves with things and protect ourselves from ourselves through the contextualization that certain things provide. To be a human is to be in relation to—*by means of*—things. Not necessarily in a desirous way, but in a physical way. Our embodiment does not end at the membrane of skin that encases our organs and bones and fluids. To be human is to produce things, to be in relation to objects, and to be able to entertain the notion that we, too, from certain vantages are objects, as well. It is to reside across time in the liminal space between the increasingly blurred ontological categories of subjects and objects. It is to ride the tide of that blur, the process that blurs as enacted through our designs and actions.

As a means of characterizing and then investigating the possibility of things in the contemporary imaginary of Internet of Things—a possible future in which objects from door knobs

to shoes to cars to pills do, in fact, talk in the form of data collection—the remainder of Part II of this dissertation will be devoted to analysis of a few forms of empirical data: Tweets from Twitter; promotional materials (including videos and print media) from industry stakeholders; emails; landing pages; GUIs; and consumer packaging.

Chapter Four: Distant Reading, Discourse, and IoT

4.1 Introduction: Towards Reconciling Temporalities

In Chapter Two of this dissertation, I began empirical consideration of IoT by means of a literature review. This literature review was purposefully focused on the analysis and critique of IoT as it is defined in scholarly literature. In being so focused, it treated definitions and descriptions of IoT as data: rather than approaching objects themselves (e.g., IoT-enabled devices such as FitBits, Nest Thermostats, etc.) descriptions and operationalizations of IoT were treated as objects that function to bound the limits of IoT—to a provide a scholarly placeness. As such, it provided a baseline for understanding just what we're talking about when we talk about IoT—at least from the formal perspective of research. As pointed out, however, such an analysis falls short of approaching the extent to which IoT functions as part of a larger social imaginary (Taylor, 2004).

The goal of this present, second part of the dissertation is to more directly observe and analyze IoT as a component of a greater social imaginary: IoT as it is portrayed outside of the realms of research and scholarhsip. In so doing, it approaches IoT as a discursive construction contained within a greater historical *a priori,* itself a symptom of—or phenotypical expression of—the human archive and its potential futures. This chapter marks the beginning of formal attempts to identify and define the discourses that contribute not only to the rise of IoT, but more importantly, the discourses that are likely impacted by processes of transformation brought about by IoT.

In this chapter, I present theoretical and methodological underpinnings of Latent Dirichlet Allocation (LDA) (Blei et al., 2003), a form of textual analysis, or distant reading (Moretti, 2013) more broadly known as topic modeling. It is important to note, however, that while I will touch on the basics of the statistical theory that underlies LDA, I will focus less on this aspect than on my own interpretation of its possible applications (as supported by various pieces of scholarship from

the burgeoning field of Digital Humanities). Within the context of this reading, which gives rise to a 'snapshot' approach to LDA the goal of which is to reassemble a given text a novel way, I further discuss the relationship between the topics that arise from such an analysis and the Foucauldian notion of discourses. Finally, I analyze and describe the individual topics uncovered through distant reading in order to create an empirically grounded, though highly interpretive, armature for the identification of discourses and potential sites of discursive transformation that will follow in subsequent chapters.

This armature begins its employment as a snapshot of the imaginary of IoT in the form of ten topics, which are subsequently reassembled into groups. This final reassembling of topics comes as a response to prior work that attempts similar LDA-based analysis of IoT-related Tweets, but yields theoretically unsatisfying results. I rely on the notion of 'addition' (as used by Braudel in his critique of Bendetto Croce) (Braudel, 1970, p.148) to justify a more literary, open interpretation of the topics generated in order to gain novel insight into the discursive construction of IoT.

4.2 La Longue Durée et L'Histoire Evénementielle

I have been fascinated by the historiographical notion of the *longue durée*, pioneered by Fernand Braudel of the Annales School of historiography. My interest stems from the apparent discord between the increasing speed of knowledge production in computerized empiricism and the notion that we are always already, as members of a culture and society, subject to the long-term powers of a greater history, a history that extends from the relative ephemerality of material goods and cultural materialism through to the much longer history of geological time, and physical time. These various rhythms of history—the temporal boundaries we assign to the passage of time

in order to practice the construction of historical knowledge—are, of course, all part of the same continuum. The primary point of theoretical interest here is to develop new means of dividing that continuum, or new vantages from which to view facets of that continuum, in order to explore the construction of a history of the present tense as it manifests digitally.

As one might expect, the continuum of history runs from the very long term to the very short term. However, there are functional and experiential blindspots that emerge along such a continuum based on human limitations. Just as the average human life at the beginning of the twenty-first century rarely lasts longer than a century, and therefore precludes the experience of longer rhythms, so too does the experience of perception preclude the human from directly experiencing the highly diminished, even infinitesimal rhythms at which computerized analysis of data occurs. In that these two categories of durations, of rhythms, are inaccessible to direct human experience, I contend that they are functionally equivalent: they both belong to a category from which humans, by virtue of being human, are alienated. Both occur at rhythms beyond the reach of human perception. Both require systematic forms of inference to approach an understanding of them. This chapter is devoted to the description and application of just such a form of inference and begins with a careful consideration of the 'events' that constitute the focus of historical inquiry.

In approaching the two ends of the continuum, the *longue durée* and *l'histoire événementielle*, I use the term 'discord' not because these two concepts of, or approaches to history, are inherently incompatible, but because they overlap in uncomfortable ways: in a epistemological era predicated on computerization, wherein the reduction of the world to machine-readable data has become an unmarked category—reductionism almost seems to disappear in the rhetoric of big data wherein data sets are large enough to functionally replace the phenomena in the world they are collected to describe—it is all too easy to construct knowledge based only on the immediate history black-

boxed behind the interfaces of computerized colonialism. That is: computerized empiricism has grown to such a widespread usage across disciplines—I direct your attention to the rise of Digital Humanities—that it all but supplants prior forms of knowledge production, and in doing so, supplants prior knowledges.

The lopsided tendency to adapt ever faster, more efficient means of data analysis—sometimes contextualized with the term 'acceleration' (R. A. Bentley & O'Brien, 2017; Gleick, 2000)—highlights an unexpected outcome of the computerization of knowledge production: not only can a taxonomy of historical inquiry be constructed according to the different scales at which such inquiry takes place (e.g., years, decades, centuries, millennia), but so, too, can knowledge production itself be placed into an analogous taxonomy based on the breadth and speed of data collection and analysis. As such, the production of empirically derived knowledge, as produced by, say, LDA or other similar forms of computerized, digital-data-heavy analysis, appears to belong more to a prior form of historical analysis concerned with the history of events (Simiand's '*l'histoire événementielle*' [Braudel, 1970]), than to any longer form history that directs itself to questions of temporal arcs, greater trends. But in concerning itself with a history of the ever-faster present tense, data-intensive and computerized methods for the production of history overshoot their mark: they alienate the human analyst, the historian or historiographer, from the phenomenon in question just as the long arc of geological time alienates her. The present, if operationalized in a way that cannot be experienced or cognized, resides in the same realm as the distant past: both escape the experience of the observer and can only be approached by inference.

It is as though the speed with which computerized knowledge production performs itself on a set of data stands in for the temporality of the event such data represent: the temporality of the experiential world, of human phenomena occurring within a given historical milieu, is reduced to,

and supplanted by, the temporality of processors and internal clocks, transformed into a medium as fundamentally, experientially inaccessible as the bodies of water that formed the Grand Canyon.

Data and the world they represent are reduced to a temporal realm that unfolds at scales bearing more similarity to unexperienced, pre-cognitive neuronal speeds of neurotransmitter and electrical transmission than the speeds and rhythms of the lived-in world. What we are left with here, as humans in a human world increasingly divorced from the experience of being human, is an empiricism that is manifest as an eternal return to the present, but a present that occurs at a speed phenomenologically inaccessible to the living human. This is the inverse of the extended present tense: a present tense extended into pre-experiential increments by rhythmic diminution; things become faster as the increments of time by which they are measured diminish. This observation and analysis of events occurring in this pre-experiential present tense is predicated on mediation: in that such mediation (i.e., analytical outputs represented on a computer screen) acts as a bridge between human interpreter and humanly uninterpretable events, it can be thought of as a prosthesis, not unlike the canonical blind man's cane in the literature of phenomenology. So, then, the functional equivalency of studying the minuscule present and the long past becomes characterized by the prostheses that allow for inferences about that which is fundamentally unobservable: the production of historical knowledge at either end of the continuum (and possible all points between) must then always be contextualized by the issue of embodiment, the relationship between mind and body, and the role that objects play in the act of inferring about, and therefore accessing, a fundamentally inaccessible form of event.

What is needed in response to this unfortunate state of phenomenological inaccessibility is a rebalancing: if, as was argued by Benedetto Croce in the early twentieth century, all history is a

history of the present tense (Croce, 1921), but the scale at which the present tense unfolds is shrinking by means of computing capabilities—by increasingly virtuosic speeds of prosthetic interaction—then we find that all history (created through computerized interventions) is a history of an inaccessible present tense: a snapshot taken with an aperture much quicker than that of a human's blink.

The metaphor of aperture illustrates: a good photographer can manipulate her apparatuses in such a way as to capture images that do not register as stand-alone to the human eye. This certainly does not mean that the images do not exist, but rather exist at a speed at which they are only processed as part of a greater set of action in the world—a continual signal. The removal of the image from the stream, the experience of the environment, can be a thing of great beauty and value; however, it only gains its value once its stillness, the graphical manifestation of aperture speed, is reinserted into the flow of signals that the human interprets. The snapshot of the eagle catching a trout, of the whale breeching, of Nolan Ryan releasing a baseball at impossible speeds, is only meaningful as an artifact when it, being divorced from the flow of signals in which it naturally occurs by mean of a camera lens and shutter speed, is reinserted into the experiential realm by the act of viewing. It is not enough to take the picture, not enough to create the data: the picture, the data must be interpreted, and through interpretation, reinserted into the realm of the experiential, lest it lose its import.

If this is the case, then it becomes necessary to reconcile two apparently phenomenologically irreconcilable present tenses: that of computation and that of human experience; that of the human-independent means of data collection and analysis proposed by Ashton and discussed in Chapter Two, and that of the primarily human. The speed with which computation allows the creation of empirical knowledge negates Croce's statement in part: whereas for Croce all history is a history

of the present, I argue that we, as a nearly ubiquitously computerized society, are moving into an era of the practice of history wherein all history is a history of the near future, a history of the lag and catch-up between human experience, the computerized analysis of data, and the temporal gap between collection-analysis of data and the human construction of 'what should be done with such analysis.'

If the long past is as experientially inaccessible as the infinitesimal present, then both are rendered functionally similar by means of the human act of interpretation and inference that occurs at the temporal rhythm of human cognition. What needs doing is the construction of a logic of reinsertion, by which I mean a logic that accounts for the removal of data from an inaccessible tense, its rendering as accessible, and its reinsertion into a phenomenological realm defined by normalized human sensation and perception: the speeds of the universe and of the computer must be reconciled with the recently impoverished speed of human embodiment. In an attempt to provide such a reconciliatory logic, I develop in this chapter what I refer to as the 'snapshot approach.' This snapshot approach will allow for the identification of the discourses that comprise the social imaginary of IoT, as well as the potential transformations they might reasonably undergo.

Although the historiographical theory of the Annales School is not the primary focus of my dissertation, it bears some discussion here given its relationship to the 'snapshot' approach I take by means of engaging in the primary steps of LDA topic modeling. Given the strong claims I have just made in the paragraphs above, explication of Braudel's '*longue durée*' is essential. In order to make my way (efficiently) through the aspects of Annales School historiography that color the background of my own inquiry, I will present and explicate several key—although necessarily

reductive—excerpts from Braudel. In so doing, and in relation to Braudel, I will also present an excerpt from Sartre's '*Questions de méthode*,' which was published in various forms in 1957, 1959, and again in 1960 and translated as Search for a Method in 1968 (Sartre, 1968).

First Braudel. The quotes that follow are drawn from Braudel's 'On History' (Braudel, 1982, translated by Sarah Matthews) and serve in their inimitable way as a call to historiographical action, wherein the scope of historical practice should be scrutinized, even revolutionized. Such scrutiny or revolution occurs at the point of disjunction between what Francois Simiand referred to as '*l'histoire événementielle*' and its opposite: *la longue durée*.

Braudel writes:

> […] we find a history capable of traversing even greater distances, a history to be measured in centuries this time: the history of the long, even of the very long time span, of the *longue durée*. This is a phrase which I have become accustomed to for good in order to distinguish the opposite of what Francois Simiand, not long after Paul Lacombe, christened '*l'histoire événementielle*,' the history of events. The phrases matter little; what matters is the fact that our discussion will move between these two poles of time, the instant and the *longue durée* (Braudel, 1982, 27).

For Braudel, the *longue durée* presents as a foil to an increasingly myopic history of the event. It is a history of continents and sea levels rather than earthquakes and waves. But while the difference between a long history and a history of events can be inferred through the negative definition of events implied by a positive definition of '*longue durée*,' it is still necessary to further clarify just what is meant by 'event.'

Braudel goes on to trouble the term 'event' to further explicate the importance of a telescopic view of history:

> Take the word *event*: for myself I would limit it, and imprison it within the short time span: an event is explosive, a '*nouvelle sonnante*' ('a matter of moment') as they said in the Sixteenth century. Its delusive smoke fills the minds of its

> contemporaries, but does not last, and its flame can scarcely be discerned (Braudel, 1982, 27).[109]

The notion of 'delusive,' or of the delusion created by in-the-moment-events is key for understanding the relationship between the two scales of temporality discussed. Focusing on the imprisoned notion of 'event' risks leading the analyst, the historian, in the direction of misdirection, of unwarranted expectation. Events delude by the semantic framing effected by the term 'event:' one expects an occurrence, and in expecting an occurrence, one comes to expect something accessible to the human (whether through inference or experience) by virtue of the roots of 'event' in a human language. But, so, too, does the *longue durée* delude. (What is history at any scale of time if it has no bearing on the prison of moments and events in which each of us lives our lives?)

The '*longue durée*' and its components become an event as any other: they become something framed by human cognition and logic, always already framed by the temporality of the human analyst. Just as it is easy to lose orientation within the cloud of smoke pouring off of the eventual present, it is reciprocally easy to lose sight of that present tense—of life lived through the interface of the human archive—because of the smoke arising from fires of multiple centuries. In loosely Derridean terms, the coinage of '*longue durée*' as a reaction to an extant historical mode (*l'histoire événementielle*) indicates that '*longue durée*' must always exist in relation to a shorter history: that the two cannot reasonably exist without each other, and in being so logically entangled, they comprise elements of the same greater set, each of which can be reduced to related conceptualizations of the notion 'event.'

[109] Matthews's translation of 'nouvelle sonnante' as 'a matter of moment,' is problematic. I prefer a reading that focuses on 'sound,' as in 'new resonance.' 'Resonance,' rather than 'sound,' does well to situate novelty within a greater historical trajectory.

To conceive of a *longue durée* and the history of the event as dichotomous categories requires the acknowledgment of the existence of both. As such, to practice historical analysis in the vein of the Braudel's *longue durée* is to keep one eye focused on eras and ages, and the other eye on that of the mundane—the prison of the event, even as the prison includes cell blocks for all temporalities. Both provide the requisite context for their counterpart, and in providing such context, give reciprocal meaning. As such, la *longue durée* presents as an event, too, or perhaps a container of events where the container is, itself, an event: it is conceived of and treated according to moments experienced through the human kit of sensation and perception. The event, it seems, is as inescapable as the role of the human in producing historical knowledge.

But this may change if the notion of 'event,' the temporality of its utterance and semantic content—its importance in the experiential realm where concept meets world—can be divorced from that of human temporality. It is possible that such a divorce is already in effect, although in a somewhat unexpected form: in the inaccessible scale of time at which computerized data analysis occurs. Such analysis, by means of transplanting data-in-the-world to a realm of experientially inaccessible time, might well break the notion of the event, tied as it is to an experienced phenomenon, free from the prison of human experience, thus allowing consideration of that which has not yet been experienced: the near future. In divorcing the present tense through the increased rhythmic diminution of computer processing, any such computerized production of history becomes not a history of the present tense, but a history of a future where the human historian races in an unending game of catch-up to analyze data already analyzed at speeds no mind can achieve. Whereas, for Braudel (Braudel, 1970, 1982; Braudel & Colin, 1987), in reading the work of Croce (1921), all history was a history of the present tense, I contend that all computerized history is a history of the future, of the trajectories of computerized processing, of the world as it

may well be through the archival possibilities inherent in the ubiquity of computerization, of a prosthetic and parallel cognition.

In Braudel's questioning of events, one sees, after the fact of course, the precursors to questions asked somewhat indirectly by Foucault in his 'Archaeology of Knowledge' pertaining to the nature of 'statements,' wherein statements (*enoncés*) belong to a broader realm including both events and statements (as the term is generally understood in English). This broader realm is defined by Foucault as the archive — notably, the term 'archive' signifies its status as a conceptual boundary object (Star, 1989, 2010). In dropping the 's' from 'archives,' the term's common appearance in both French and English, Foucault alludes to a boundary space, a conceptual liminality, between the written, evidence based 'archives' of Rankean history and a broader sense of history wherein the past meets the present in an ever expanding and reducing (telescoping) scale of temporalities, stretching from minutes and seconds to the vast scope of geological time.[110]

In the work of Braudel as it is interpreted in our present historical *a priori* defined largely by the emergence and ubiquity of computerization, the reader finds the kernels of a historiography that turns itself simultaneously to the mundane, as well as the catastrophic pile of events (*à la* Walter Benjamin's Angel of History) which is built by the accretion of the mundane and subsequently redacted, dissected, and reduced to an ostensibly representative group of 'important' events that provide an easily discernible narrative for a given period of time—usually one that occurs somewhere between a century or two (an era) and the scope of one human life. In the functional equivalency of the *longue durée* and the increasingly infinitesimal present tense of a computerized *histoire événementielle*, the event is always necessarily framed as illusive, as

[110] Unlike Foucault, Derrida's treatment of the archive seems to have included the possibility for such telescoping to include temporalities inaccessible to the human body. Derrida did, after all, devote one or two lines of his Archive Fever to the question of email's impact on the Freudian archive. (Derrida, 1998, p.17).

delusion: all that remains is the mundane, the non-event. The non-event is that which is experienced—to borrow a line from John Lennon, the non-event, like life, is 'what happens when you're busy making other plans.' The question, in light of this statement, becomes whether or not the mundane, the non-event, can be approached as a topic of historical inquiry.

As Braudel writes, 'All historical work is concerned with breaking down time past, choosing among its chronological realities according to more or less conscious preferences and exclusions' (Braudel, 1980). My own foray into the imaginary of IoT and my desire to construct a snapshot history of the non-event in the projected future of IoT is no different: I have conscious preferences for the scope of my own historical inquiry and make exclusions, too. But my preferences and exclusions benefit from the analysis of those historians and historiographers who brought the importance of such actions to light.

One sees in Braudel's dialectic treatment of events as belonging to both (paradoxically) the immediate present and the *longue durée*, precursors of Derrida's work on archive theory. Notably, one detects resonance with the notions of jussive and sequential violence—wherein that which is effected through violence in a present tense is always already impacted by the conceptual, or categorical trajectory or a jussive violence—and resonance with the notion of 'spectrality' that would come to reside so closely to the center of his archival project. This spectrality, which will receive detailed coverage in the final part of this dissertation, refers to the form of presence that is connoted by absence. That is, and in terms of Braudel's *longue durée*, spectrality presents itself in the absence of long-term focus found in *l'histoire événementielle*. Such an absence of the long term is not an absence at all, but a negative space that bounds and defines (through violent conceptual means) the scope of the imprisoned event—the present tense in all of its delusive potential.

Although Braudel wrote of the l*ongue durée* prior to the works of either Foucault or Derrida that will take center stage in the third part of this dissertation, it deserves further explication here, beyond the simplified dichotomy of short-term and long-term temporality and duration. Perhaps it is *because* Braudel wrote before Foucault and Derrida that they deserve explication: in calling for a break from *l'histoire événementielle*, Braudel is performing a certain violence that both validates and necessitates the subsequent approaches taken by Foucault and Derrida, focused as they are on the appearance of discursive discontinuity and spectrality (respectively).

I argue that this break from the 'event' is ultimately effected by the rise of computerized analysis: in breaking from the event as it exists within the prison of human experience (of subjectivity), computerized analysis of data creates an un-event, no more or less accessible to a human interpreter than centuries of water passing by a chosen point. That is, the human interpreter can extrapolate and infer its prior existence, but cannot, in fact, drink it, bathe in it, or even see it. The possibility of an event is erased through the location of its ontological identification within the alien phenomenology of the computer. What remains is the construction of an event from an un-event—a feedback loop extended between the present tense of lived human experience, the past tense of the computerized analysis (broken down into phenomenologically inaccessible increments of time) and the near future tense of human analysis. In this subtle dance between the world, data about the world, the computer and the human, we arrive at a new prison, a new periodization of the event: the long present tense, history-as-snapshot.

In further explaining his characterization of the 'event' as delusive, Braudel discusses a key methodological issue with *l'histoire événementielle*:

> Doubtless philosophers would tell us that to create the word thus [as the prison that Braudel defines] is to empty it of a great part of its meaning. An event can if

> necessary take on a whole range of meanings and associations. It can occasionally bear witness to profound movements, and by making play, factitiously or not, with those 'causes' and 'effects' so dear to the hearts of historians of yore, it can appropriate a time far greater than its own time span. Infinitely extensible, it becomes wedded, either freely or not, to a whole chain of events, of underlying realities which are then, it seems, impossible to separate. It was by adding things together like this that Benedetto Croce could still claim that within any event in all history, all of man is embodied, to be rediscovered at will. Though this, of course, is on condition of adding to that fragment whatever it did not at first appear to contain, which in turn entails knowing what is appropriate—or not appropriate—to add. It is the clever and perilous process which some of Jean-Paul Sartre's recent thinking seems to propose (Braudel, 1982, p.27).

In this somewhat lengthy excerpt, Braudel borders on issues of linguistics and semantics that would later (or simply elsewhere) be addressed by semioticians. That is, there is an openness to the term 'event,' bounded only by the preferences and exclusions of the interpreter (Eco, 1989), through which the reader inserts herself into the triadic composition of the sign. Braudel hits on a fundamental problem, a basic condition of human communication: to use a word in a meaningful and purposeful way, is to undo the wholeness of its meaning for the sake of specificity.

To employ the term 'event' in either the sense of *l'histoire événementielle* or that of the *longue durée* to which it gives rise, is to reduce the concept of 'event' as one that potentially conflicts with itself in the temporality of the phenomenon it describes, to something other than its totality. In approaching 'event' as either the delusive prison of the present or the (equally delusive) panopticon (Bentham & Božovič, 1995) of the *longue durée*, is to define by way of violence, to create within the word an archive unto itself, an archive wherein meaning is inscribed, and through inscription the archive as 'whole' is destroyed.

In so constructing the 'event' as dichotomous—in the short-term or the long-term— and therefore never fully whole in any given usage, Braudel addresses a fundamental condition of any present tense, even as he directs those historiographers who would become part of the Annales

School to focus not on the delusive smoke of the present, but on the broader, subtler and slower history of the *longue durée*. In both cases, however, we ultimately return to a Derridean violence: that which is the subject of history, by virtue of being historical, is not the subject of experience, but the subject of description and therefore the temporality in which that description originally occurs. To pass worldly phenomena through the filters of history, always somewhere in the vector of 'event,' is to filter phenomena in a way that cannot be experienced directly. It is in this way that any history (including Croce's history of the present tense) belongs to the same category as a history of the future: it is a history of that which is inaccessible in time, but for *post hoc* inference and analysis.

To put a finer point on it, I will turn my reading first to an apparently unrelated notion (affordances), and then to the piece from Sartre to which Braudel referred. Braudel, in laying down the cornerstones for a new form of history, centers on the problematic concept of 'event.' While it might seem more logical to turn to Foucault, for whom the notion of 'event' was so central, the appearance of 'event' as a basic unit, as a fundamental pillar in the experience of the world, lends itself more to comparison with Heidegger's treatment of the term 'thing.' Both terms (event, thing) are so basic in their semantic qualities as to seem unending in their analytical possibilities. That is—as was the case for Heidegger's treatment of 'thing' (Heidegger, 1968)—any treatment of event must move beyond the realm in which the concept is used and delve deep into the rabbit holes and caverns of philosophy. In particular, a philosophy of time and space, of physics. I make no claim to being a physicist, so such a direction would be wholly inappropriate for me to pursue. However, there are aspects of time and space about which I am qualified to write: namely, the occurrence of subjectivity within time and space.

Contra Heidegger's treatment of 'thing' (see my analysis in Chapter 2), I maintain that 'event' retains no meaning in the absence of a subject that experiences it, or in bearing witness to it in either a present tense, or through inferential processes of abduction, induction or deduction (what Russell would categorize as 'knowledge by description' [Russell, 1951]), reifies it with language as 'event.' Just as the 'thing' in my reading of Heidegger is bounded first by the cooccurrence of subjective qualities and objective qualities, and then rendered as 'thing' by the action taken born of the possibilities of combination, so, too, is the event created by a similar cooccurrence of subjective and objective qualities.

The notable difference between 'event' and 'thing' is as follows: where a 'thing' is generated at the point of action as a result of subjective and objective qualities, an 'event' is created—in a wholistic sense—through the interpretation of the 'thing.' That is, the thing—actionable potential realized across the subject-object divide—becomes 'event' as would be addressed by history through the interpretation of its historicity; through the contextualization of the 'thing' in terms of a broader temporality. This contextualization has as much to do with the subject and object that gave rise to the 'thing' as it does with those interpreters who describe it and reduce, redact, or add to it in order to position it along an historical narrative—regardless of its temporal scale. This is the dance of subjectivity within an historical epistemology that had, theretofore, relied largely on the constructed objectivity of evidence-based (i.e., empirical) practices. In being fundamentally a human concept, the 'event' exists as an object, and that object (always already) coupled with the historian-subject becomes a 'thing.' That is, it becomes a dyad of subject and object, each of which possess certain characteristics that in combination yield a set of potential statements about that 'thing.'

It is not just now, however, in the constructed objectivity of empirical history that my interest lies, nor is it the location of what I find so intoxicating about the historical potentials of Braudel's writing. Rather, it is the spectrality that surrounds the defining of 'event' in a reductionist way that catches my attention. If we begin with the inference that any operationalization of 'event' is a reductive one—'empty[ing] it of a great part of its meaning'—and the inference that a *longue durée* approach is to correct some of the epistemological errors of *l'histoire événementielle*, then a third possibility—not necessarily between, but rather above and between as in the third point of a triangle in relation to the two below—becomes visible. We begin to see the 'event' not as a signifier of something concrete, something that happened or unfolded over any given period of time, but rather as fundamentally a scene for interpretation and inference. The event is not ***x*** or ***y***, as in either form of narrative prison, but it is the greater set to which ***x*** and ***y*** belong: it exists as potential narrativity, where such narrativity is bounded by at least two primary external forces and one internal to the interpreting subject: the first two forces are derived from what Foucault calls the historical *a priori*.

There is first the historical *a priori*, or set of archival conditions, in which analysis takes place. This would be the world in which Braudel lived—the cultural norms, the technologies, the streets, and the looming threat of Nazism. There is then, secondly, the historical *a priori* in which the event occurs. These are not necessarily separate or separable should the temporality of the event and the interpreter overlap. The third force, the possession of the subjective interpreter, is that of their own social imaginary: that is, those elements of culture and experience that are ingrained in the subject so as to make the subject, and through which the subject necessarily makes sense of the world.

It is as a result of this third force that questions of 'addition'—'adding to that fragment' in the words of Braudel—come into play. The subject-interpreter (the historian, or given the scope of the

Annales School: the humanist-scientist) adds to the historical *a priori* of the event and their own milieu those inferences that are derived from subjective experience. In the case of computer-aided analysis, this addition is always already one of 'the future,' of the possibilities inherent in computerization: we see IoT not as it exists in the present, but through the addition of potential futures; the future becomes entangled in the present and therefore the past. One might think of these as heuristic abductions, or the forms of inference that arise not from the careful use of logic, but from sets of lived experiences that allow one to infer that 'unexpected observation C' could be explained by A or B, thus adding A and/or B into the logical mix (Fann, 2012).

In this light, any addition of meaning into a given fragment-event is necessarily a phenomenological occurrence: it is derived from the subject sense made of that which appears in the world. As such, the construction of the historical event-as-thing (and therefore as non-event) must always be an act of interpretation, grounded as it is in the coupling of a subject with an object. But notably, in the case of computer-aided addition, it is the occurrence of phenomenological absence that is added: the inclusion of something that cannot be experienced, but only inferred or seen *post hoc* as a result of products and outcomes.

In the words of Sartre, referenced rather obliquely by Braudel, this phenomenological occurrence is one of abducing the 'totality' of an event where the totality of an event must include that which is absent from it, its future histories:

> But in no case, in Marx's own work, does this putting in perspective claim to prevent or to render useless the appreciation of the process as a *unique* totality. When, for example, he studies the brief and tragic history of the Republic of 1848, he does not limit himself – as would be done today – to stating that the republican petite bourgeoisie betrayed its ally, the Proletariat. On the contrary, he tries to account for this tragedy in its detail and in the aggregate. If he subordinates anecdotal facts to the totality (of a movement, of an attitude), he also seeks to discover the totality by means of the facts. In other words, he gives to each event, in addition to its

> particular signification, the role of being revealing. Since the ruling principle of the inquiry is the search for the synthetic ensemble, each fact, once established, is questioned and interpreted as part of a whole. It is on the basis of the *fact*, through the study of its lacks and its "oversignifications," that one determines, by virtue of a hypothesis, the totality at the heart of which the fact will recover its truth (Sartre, 1968, p.25).

The key conflict in this quote—and the reason I have deduced it as the referential recipient of Braudel's opaque citation—is the relationship between 'detail' and 'aggregate.' We see in this choice of terms an echo of Braudel's 'event' as it occurs in both *l'histoire événementielle* and *la longue durée*. Any approach to the event (in Marx's case, the Republic of 1848 as event) either in terms of a short duration or a long duration never actually approaches a totality. The totality of Marx's Republic of 1848 must include that which it cannot include: it must include the future histories, the interpretations of Marx's own interpretation. It must include that which cannot be deduced or induced, but rather abduced: potential histories of the present as filtered through the lens of Marx's Republic of 1848. As such, the process of telescoping between the detail and the aggregate, between the event and the *longue durée*, cannot ever be complete—exist as a totality—unless some attempt is made to account of the future histories of the event. In this way, to discuss the totality of an event is to discuss the event's existence within the archive, the set of all possible statements of and about that event.

This seems like a fool's errand, the prediction of future histories. But the foolishness of the errand is based entirely on the notion of prediction, where 'prediction' means to violently reduce the possibilities of the future. A softer version of prediction is necessary: forecasting. What I mean by this is the careful, experientially and analytically grounded identification and description of the discourses that allow for a given event—its framing, its temporality, its creation as an event—and

an abductive analysis of possible transformations of those discourses based on their own inherent possibilities.

Braudel, Croce, and Sartre should not, however, be unreasonably criticized for failing to address this aspect of totality. Rather, through their own contributions to the theory of historical knowledge production, they each worked as guides towards the possibility of a future history; the rise of computation and its proliferation across disciplines including history further catalyzed such a possibility.

It is within this state—wherein the theories of Braudel, Croce, and Sartre sit alongside the power and speed of computation, with its phenomenological qualities as inaccessible as that of the long past—that I return the reader's attention to the discussion of distant readings soon to be presented: the use of computing in the analysis of historical data (or any data, for that matter) necessarily allows for the addition of further fragments to a detail, to an event. Through such careful addition of fragmentary supplements, it becomes possible to construct not an 'event' but a greater, broader non-event: to construct the mundaneness that surrounds the event. In that the computational mechanisms involved in computerized analysis are fundamentally inaccessible to the realm of human phenomenology, but must rather be inferred, they always already allow for evidence-based aggregations, additions, based on that which cannot be experienced, but which might reasonably be expected to fall into the greater set to which the historian (as analyst) and the event (as subject of analysis) belong.

4.3 Analysis of Topics

Ten topics were derived from the previously described LDA analysis.[111] It is tempting to assign them unique names beyond the string of words that comprise them, but I will resist that temptation: to assign a name, a bucket with a label into which each of these topics would fit, is to jump the gun in an overly reductive fashion. More than that, it would somewhat diminish the value of the loose and interpretive knots that ties these strings together: the topics that follow are purposefully introduced as dismembered and anatomically anonymous—they are as the limbs left in Grendel's cave, born of a necessary (archival) violence that sustains the text their mythology creates.[112] However, following analysis and interpretation of each of these topics, it will become germane to do something along the lines of reassembly, or re-memberment—to organize them in a way that reaches somewhat beyond the standard, vanilla categories provided by Bian, et al., (2016) in their own LDA analysis. Such re-memberment will occur through the final analysis of this chapter, presented in the Summary section.

4.3.1 The Topics

Each of the ten topics—not unlike the topological structure of Derrida's 'Archive Fever'—are presented as beginnings: exergues, prologues to the broader discursive structure of the text they partially describe. Metaphorically: each of them serves as a potential door through which one

[111] For a detailed discussion of the LDA method, please refer back to Chapter Three.

[112] It is worth noting here that I use the term 'mythology' in the form used by Vilém Flusser (Flusser, 2011a): a form of pre-textual thinking, wherein such pre-textuality is achieved through the dismemberment of the text—the unraveling of the text's [*textere*] threads.

might pass into the disassembled hallway of the greater textual corpus to which they belong. In this hall, perhaps of marble or other stone, one finds the reverberations of the text's layers like cocktail conversations at a Gilded Age dinner party, its possible readings, its myriad and diverse underlying authorial intentions and readers' responses. The topics present the text they describe as a truly open work (Eco, 1989): not as a cohesive work ready for interpretation as described by Eco, but rather as an *opened* work—a dissected work, a body and its parts on a surgical table—ready for the Modern Promethean task of interpretive reassembly, of a study in textual anatomy and physiology. We disassemble the text with knowledge of Gestalt principles so as to see beneath it, beyond it, into its constituent parts that, in sum, create a broader archival presence than they do in isolation.

Topic 1:

data bigdata big analytics cloud business digital companies industry manufacturing top healthcare future technology key making tech management sasgf innovation

The words comprising a given topic are listed in order of their weight. That is, they are listed in order of the extent of their semantic importance within the topic created: the earlier the word appears in the list that comprises the topic, the more central that word is to the discourse represented by that topic. As such, it is tempting to refer to Topic 1 as the 'data' topic. But for the reasons described above, I will refrain at this point from doing that. Instead, suitable analysis of this topic—suitable in that it leverages the exploratory value of this method—begins with examining the relationships between the terms in the list so as to gain a clearer and more nuanced interpretation of the discourse being represented.

For example, the first three terms appear to reside closely in the same semantic realm: each of them has as a referent some aspect of measuring the world. This becomes clear through an analysis of the term 'data.' Data is derived from the Latin, 'datum,' meaning that which is given about the world. Immediately, then, we see that this topic is about describing or explaining the world from which data is pulled, and of which it is therefore representative.

The modification of 'data' by the terms 'bigdata' and 'big' further places the empirical roots of 'data' within a twenty-first century context. Just as 'bigdata' and 'big' serve to provide 'data' with contemporary historicity, the terms also contextualize 'data' within an emerging epistemological assumption: that a positive correlation exists between the amount of data that can be gathered and the completeness of knowledge that can be produced relative to the phenomenon or phenomena described by that data. The terms 'bigdata' and 'big' situate 'data' within an historical *a priori* wherein the production of knowledge about the world is assumed to arise from computerized data collection, echoing the human/computer dialectic outlined by Kevin Ashton in 2009. (See Chapter 2.)

Moving linearly from 'bigdata' and 'data' to the fourth term, 'analytics,' continues to shed light on the discursive characteristics of this first topic. 'Analytics' refers simultaneously to the notion of analysis—or the systematic assessment of a set of data—and to the notion of a certain kind of practice within industry: a post-Taylorist practice of leveraging data to better understand the functions of an actant within the greater actor-network of a given industrial institution. With the inclusion of the term 'analytics' we begin to see that this topic is as much about understanding the world that is described by data as it is about understanding the particular worlds of given industrial actants: 'analytics' flows directly into the terms 'cloud' (a particular metaphor for the maintenance and accessibility of large quantities of data, such as those maintained by institutional

memory and archives), 'business,' 'digital,' and 'companies.' Each of these terms situates 'data' in all of its sizes, but primarily 'big data,' in the realm of the market place, in the realm of industry. This situation is further evidenced by the direct inclusion of the terms 'industry,' and 'manufacturing.'

'Top,' although somewhat more ambiguous than the terms that precede it in this topic, can also be read to refer to the competitiveness of industry. It sits among the other terms in this topic as a modifier that indicates a hierarchy of companies constructed based on their analytical efficacy. 'Top,' sandwiched between 'industry,' 'manufacturing,' and 'healthcare,' indicates that through leveraging data, companies can achieve heightened competitiveness (or a greater market share based on performance) in these areas.

The next term, 'future,' is one of tremendous significance due to its resonance with previously examined IoT texts. (See Chapter Two for analyses of Kevin Ashton's 1999 article, as well as Neil Gross's article of the same year.) The term 'future' also appears in several other topics derived from the LDA topic model currently being discussed. As such, I will reserve analysis of this term for later in the chapter. Suffice to say that the presence of the term 'future' limns an implied trajectory of IoT, contextualized by this first topic through the importance of the term data. It is as if a data-driven future is to be at the very core of the future of IoT.

Topic 2:

Internet things market industrial future connected billion business smart world retail change industry top global impact ways tech play years

The discursive referent of this topic is somewhat self-evident. Given that 'Internet' and 'things' begin the string, it is no stretch of the imagination to assume that this topic broadly refers to the point at which 'internet' and 'things' meet: the networking of objects. In this way, this topic can be seen to represent the broadest operationalization of IoT. The terms that follow, however, provide deeper context: the combination of 'internet' and 'things' is modified, or further specified, by 'market' and 'industrial.' IoT, then, is to be viewed through a lens of commerce.

The appearance of the term 'future' adds theoretical flavor: it alludes to the notion that IoT, as much as it is something that exists in the present tense—an imaginary represented by networked objects—is concerned with forward motion. That is, there is a temporal trajectory implied in the meeting of 'internet' and 'things.' The nature of this trajectory comes into focus as the topic is further analyzed, particularly in terms of one of the seminal IoT articles analyzed in Chapter Two.

This topic echoes the findings derived from the discourse analysis and close reading performed on Neil Gross's 'In the Twenty-First Century…' provided in Chapter Two. In that chapter, I provided a close reading of the ways in which the futures of IoT, as indicated by the future-framing of Gross's article, are always already informed by a particular historical *a priori* as it manifests in various disciplinary scholarly literatures. This topic, derived from non-scholarly materials, sheds light onto the secular futures of IoT: the presence of the term 'future' similarly frames IoT as an imaginary—as a means of normalizing and making sense of human actions (at both a personal and societal level) in light of technological development.

This topic limns a set of possible discursive transformations—achieved at the grand scale of the global—that may result from the realization of IoT. But insofar as it alludes to the change inherent in 'future,' it also references a continuation of human temporality: by the presence of the term 'years' in this topic, we see that the trajectory of IoT development overlaps with the human,

phenomenological experience of time at a relatively small scale. So, although any discussion of IoT must necessarily be a discussion of futures, such a discussion must not lose sight of human temporality—that set of rhythms through which the human life is lived and experiences are gained.

That 'future' is immediately followed by 'connected' and 'billions' not only implies a distal diminution of the human 'network'—the graph of human interconnectedness—but also a scaling up. The term 'connected' implies greater connectivity between nodes on the human graph, comprised of, let's say, a category of actants ranging from the individual to the societal to the industrial and governmental.[113] 'Billions,' with the rhetorical force of high numbers, implies a scaling up. At once, through the resonances of the term 'connected' and the rhetorical function of 'billions,' we see that the meeting point of 'Internet' and 'things' is characterized by both a shrinkage—a higher degree of connectivity—and a greater scale as is represented by 'billions.' This topic, so far, presents the notion that the scaling of up networked things in the range of 'billions' will also, by virtue of networking, create a more densely intertwined graph of actants. There will be more actants, but they will be more closely connected.

The effect of scalar connectedness is as yet undefined. It exists as only a faint silhouette in this topic; however, one term alludes to the possibilities present in scalar connectedness: 'ways.' 'Ways' can be interpreted as a placeholder for the term 'modes.' That is, one hears the silent statement, 'the world (as defined by those nouns identified in this topic) will change in certain ways;' this silent statement, when combined with the notion of 'play,' alludes to modes of knowledge production, 'ways' in which the world will be known by and through myriad actants,

[113] This is necessarily a tricky concept, as it calls into question the notion of agency—I argue that the possession of agency, the state of being agential, constitutes the condition of being a 'node' in the graph. As seen in discussions of ANT, the property of agency is not solely a human or animal property.

all of which are subject to the combined characterization provided by ‘connectedness’ and ‘billions’ in the context of ‘internet’ and ‘things.’

The notion of scaling up present in the resonances of ‘billions’ is further supported by the presence of other terms in this topic: ‘world’ and ‘global.’ The scalar changes implicit within the imaginary of IoT occur at the level of the globe, the near-absolute container for human endeavors. But lurking within this greater scale, this higher vantage of observation, can be found competition. This competition is that of business, as represented by the terms ‘industrial,’ ‘smart,’ ‘retail,’ ‘industry,’ ‘top,’ and ‘impact.’ When these terms are read together, they outline a sense of commerce in which one actant (i.e., a corporation) leverages the connectivity and scale of IoT to outperform another. So, again, in this topic we see a continuation of certain aspects of the societal and cultural *status quo*, but continuations that will occur at vast scales and with greater intertwingling (Dechow & Struppa, 2015) between actants. It seems possible, too, that the result of these two forecasted conditions further defines the notion of ‘smart,’ which will receive more detailed coverage in the next chapter.

Topic 3:

Great today world join talk event day time check innovation love real learn week april good forward tech summit startup

Topic 10:

Follow latest software stay info hey touch designs engineer development platform job open developer san york cloud join wireless service

In general, these two topics can be interpreted as pertaining directly to the conference (IoTWest) that coincided with the collection of data. That is, one should read the words comprising this topic as directly communicative—they are likely communications between event organizers and followers of the #IoTWest Twitter feed. Primary focus will be given to Topic Three, followed by Topic Ten.

That this is an appropriate reading is supported by the presence in Topic Three of terms like 'join,' 'event,' 'day,' 'time,' 'check,' 'week,' 'april,' and 'summit.' Contextualized by these terms, one also reads 'today' not as a general reference to our broader, contemporary historical *a priori*, but rather to an actual day: a date on a calendar on which a certain event falls. One similarly reads 'great' as a rhetorical enrollment of attendees or potential conference attendees: echoes of keynote speakers' and organizers' optimism and enthusiasm for their events pervades this topic, indeed colors it entirely.

This rather mundane finding, however, is more important than it initially appears. In that this topic, as I will continue to argue in what follows, represents an attempt at enrolling individuals into the network of social and professional events that surrounds the imaginary of IoT, it implies the importance of social and professional events in the maintenance of the imaginary of IoT. That is, this topic indicates that IoT is not merely a conceptual constellation of discourses—a hopeful sociotechincal infrastructure birthed in the rarefied labs of MIT and various Research and Development departments—but that the imaginary of IoT is something that is maintained through social practices.

For IoT to succeed as an infrastructure, as another layer of ablative technologies through which and by which users (i.e., humans) live in and know of the world, the practitioners and designers of IoT must enroll additional individuals into the imaginary. This is accomplished, in part, through

the organization and curation of IoT-related events in which professionals, scholars, and lay-persons meet to proselytize the values and importance of the future that IoT represents. It is apparent through the inclusion of 'startup' in this topic that at least some of these potential enrollees are to be found in fledgling businesses. But all description aside, a primary exploratory finding from this topic is that the imaginary of IoT is socially maintained—the imaginary of IoT is, to some extent, maintained and negotiated through person-to-person communication.

This topic hints at two other important characteristics of IoT: first, a sense of optimism among its designers and practitioners as indicated by the terms 'great' and 'love;' second, and perhaps most interestingly, the use of several temporal terms indicates that the development of IoT unfolds in a present tense even as it is directed towards an imagined or envisioned future.

First, optimism. That a generally optimistic or positive opinion of IoT is held by the public-at-large—at least those who use Twitter—is not a new finding. In a limited way, the optimism and general good humor represented in this topic echoes the findings of Bian, et al., (2016) described in Chapters Two and Three. However, a sentiment analysis of opinions about IoT is not the goal of the current project: assuming that IoT comprises a social imaginary that rests like a mask on the long present tense of the human archive, one assumes the heterogeneity of opinions towards IoT: IoT is necessarily going to be subject to both positive and negative opinions. Rather than discussing the extent to which it is positively or negatively viewed, I will briefly turn attention to the enrolling function of the positive sentiment evidenced in this topic.

As the saying goes, 'You catch more flies with honey than vinegar.' The point of that aphorism is manifest in the positivity of the term 'great' that opens this topic. It is further bolstered by the presence of the terms, 'love' and 'forward.' The valence of the term 'love' is apparent, while that of 'forward' deserves more attention. While 'forward' might refer to a future tense, it is also ripe

with a sense of progress and expectation: one looks forward to something in a positive light; one similarly makes forward progress towards a goal. In combination, these two terms not only color this topic in a positive light, but also allude to the need for such positive light in the act of enrolling potential users and designers. I have already noted that the words present in this topic evidence a social foundation for the imaginary of IoT; in the presence of such positive words as 'great,' 'love,' and 'forward,' one is able to abduce that the positive framing of such social maintenance is a means of enrolling individuals and actants writ large into the greater social ecology of IoT's imaginary.

Second, and finally in terms of this topic, I direct attention to the periodization present in this topic. That periodization appears as a germane descriptor is evidenced by the inclusion of the word 'time' in the subject. Time is, after all, experientially incomprehensible but for its division into measurable increments. (Failing the use of such periodizing increments, time presents as a largely binary category: that which was and that which will be, funneled through the ever-fleeting present tense, which leans in either direction depending on one's vantage.) Each of these periods fall directly under the temporal-experiential umbrella of the human. That is, they refer to periods of time by which and through which humans live out their lives: the topic includes 'today,' 'day,' 'week,' and 'april.' As a result of these terms, it seems that the maintenance of IoT occurs in a temporality that is directly accessible to humans. That statement, obvious though it may be, bears importance: it indicates that the imaginary of IoT, although already demonstrated to be directed towards the possible futures that IoT represents, unfolds and is maintained in those increments of time by which a single human life can be measured. Its maintenance and growth occur in the present tense of *l'histoire événementielle*, but its futures reside in a projected *durrée moyenne*.

That the imaginary of IoT is ostensibly managed and maintained, at least in part, in the temporality of the living human (e.g., weeks, months, days) and further through social events in

which humans might involve themselves (e.g., the IoTWest conference) indicates that a certain portion, however large or small, of IoT-as-social-imaginary (and therefore as part of a the greater archive which manifests as our current historical *a priori*) is accessible to the scholarly observer *in the present tense,* or in the long present tense that reaches from the moment now back to the linguistic emergence of 'IoT' in 1999 and forward into the possible futures of the imaginary of IoT. The IoT can be demonstrated to unfold and mature, to be maintained and negotiated, in a long present tense. If this is the case, then we arrive at a somewhat staggering finding: that the Foucauldian archive can, to a certain extent, be accessed even as it is in the present-tense state of transformation; the Foucauldian archive is not only present through the accumulation and analysis of historical documents pertaining to events that unfolded across expansive temporalities, but is present and accessible through the accumulation of present-tense documentation and its analysis through the method of distant reading. I will return to this notion in the summary of this chapter, and will, for now, proceed to a discussion of the next topic in the topic model, which deals again with the concept of scale.

Topic Ten, beginning with the terms 'follow,' and 'latest,' further situates the development and maintenance of IoT in the realm of daily activities as mediated by communicative mechanisms. 'Follow' places the developmental discourse of IoT in the context of social media. It is no stretch, then, to imagine that much of the discussion pertaining to IoT—as well as the enrollment of additional users—occurs through the use of social media. In this way, Topic Ten differs slightly from that of Topic Three, but is clearly related. It differs because it adds a layer of mediation into the communicative mix: whereas Topic Three concerns itself with face-to-face maintenance and curation of IoT, as might occur at a conference, Topic Ten introduces different modes of communication. These modes—those of various social media platforms that allow for 'following,'

which include Twitter and Facebook—come with their own forms of mediation. That is, they allow for certain types of communicative interaction based on the functionalities of their platforms. (To speak in person is not the same as to write/read on a webpage.)

While it is certain from cursory analysis of these two topics that person-to-person communication plays a role in maintaining the imaginary of IoT, and likely in transforming it, the extent to which different modes of communication allow different kinds of maintenance remains unknown. Although this is a shortcoming of using LDA as an exploratory means of analyzing an archive-in-motion, the method has done its job: it has allowed for the identification of future routes of inquiry. For the moment, it is simply important to remember that IoT, as much as the literature that defines it deals in the human-computer dialectic, is inseparable from the people—the human individuals—that maintain its imaginary and design its futures by means of communication as much as engineering.

Topic 4:

Smart home smarthome cities energy tech sensors arduino technology earthday make survey power automation building homes wifi smartcities system city

This topic, beginning with the cluster of terms 'smart home smarthome cities' represents a certain scale of IoT — or, rather, two separate scales, both of which ascend to a level of abstraction beyond that of an individual user and their body with which they interface with a given object. Beyond the body, above and around it, these four terms construct a sense of the environment in which a body, a user, resides. (The inclusion of the term 'earthday' hints at yet another scale of IoT: that of the global with an eye towards ecology.) Both of these scales of IoT, that of the home

and that of the city, are modified by the primary term in this topic: ‘smart.’ In order to gain a foothold towards understanding what unites and separates these scales, as well as other scales implied through the negative semantic space created by ‘cities’ and ‘home,’ (e.g., the body, the governmental) it is necessary to first grapple with the deceptively transparent term ‘smart.’ Although it is now relatively common for objects to be described as ‘smart,’ there is a lingering strangeness to such description: how can an object be smart if an object does not cognize?

The application of the adjective ‘smart’ to inanimate actants is an instance of anthropomorphism, or, perhaps more broadly, the assignment of a descriptor best suited to animal behavior to an inanimate object. The tenth definition of ‘smart,’ which is listed as the most common usage in North America, as offered by the Oxford English Dictionary will illustrate:

> 10. a. Clever, intelligent, knowledgeable; capable, adept; quick at learning, responding intelligently to a situation, etc.; astute, shrewd; (of an action) characterized by cleverness of astuteness. (OED)

The terms, ‘clever, intelligent, knowledgeable’ all allude to a noun (and the related worldly referent) modified in such a way as to demonstrate an above average ability to interact with its world in such a way that information from the environment is processed (although it is not my intention to imply behaviorist or Von Neumann information processing) in an expedient fashion. That speed of processing is implied by ‘clever, intelligent, knowledgeable’ can be seen when the aforementioned definition is cross referenced with another, etymologically older definition of ‘smart’:

> II. Senses relating to the quality of speed, intelligence, neatness, and similar qualities.
>
> 8. a. Of an action, movement, etc.: quickly or deftly executed; fast, rapid; (of pace) briskly maintained.

8b. Of a person or (occasionally) a thing: quick in action or response; lively, active; prompt. Frequently in predicative use. Chiefly regional in later use.

Although these definitions most clearly construe a meaning of 'smart' that applies to traditionally agential actants—those capable of action, movement, cognition, etc.—the presence of 'thing' in definition 8b requires consideration. It muddies the waters, hinting at a term that is always troubled, resting on the precipice of the ontological boundary between subject and object. The OED provides a cross reference with a set of phrases in which 'smart' in this sense is used to qualify objects. The primary example given is the following phrase: 'smart as a whip.' Upon encountering this phrase, one imagines images of a whip cracking, perhaps at the end of Indiana Jones's hand or that of a lion tamer. But even in this 'quick in action or response' aspect of definition 8b, one finds echoes of even earlier definitions that have little to do with the common North American usage. To get to the link between speed and intelligence, we must dig deeper, play the role of the philologist.

The first definition provided by the OED is as follows: "1. Painful, uncomfortable; sharp, severe, intense." (This is related to the verb form's infinitive: to smart.) One sees that although 'smart' in definition 8b can at times be used to qualify an object, that qualification appears to have less to do with the intelligence of the qualified object, but rather with its speed—its quick response to the whims of the subject that wields it and the rapidity of bodily reaction, of pain, to the object's responsiveness. The porous boundary between body and object, then, is always already instantiated in the word 'smart:' from the hand of the wielder to the object wielded to the bodily response of that object's impact on another body; from subject to object to subject again. The whip of smartness extends beyond its subject-bearer or wielder into that subject's environment, not unlike the proverbial blind man's cane, to encounter and contact a third actant in the chain: a subject that

feels the smart of the whip through the channels of the nervous system, reaching from the skin-boundary of the body to the brain. ‘Smart,’ as with a great many other lexical chimeras, transcends and troubles the subject-object dichotomy if only to highlight their intimate, enfolded relationships.

Having addressed the largely colloquial and regional application of smart to objects, we are left primarily with the initial sense of ‘smart’ as provided in definition 8b, somewhere in the triangulated semantic space between ‘clever,’ ‘intelligent,’ and ‘knowledgeable.’ Naturalized as we are to the digital technologies of our contemporary historical *a priori*, it is difficult to envision an application of ‘smart’ to pre-digital, knowledge bearing—that is, inscribed or inscriptive—technologies. One might think of a printing press as smart, but such usage of the term was not yet common at the rise of Gutenberg’s age. Similarly, it is difficult to assign this adjective to the trappings of formalized intelligence or knowledge: a book, although an integral carrier and transmitter of knowledge, cannot be said to be ‘smart.’ Something, or somethings, changed or transformed in the realm of the sociotechnical and the linguistic over the past few centuries such that ‘smart’ became applicable to inanimate knowledge-bearing (inscriptive) objects.

It would appear, through an analysis of this topic and the other terms that comprise it, that IoT embodies the historical, sociotechnical-evolutionary changes that allow inanimate objects, non-cognizing actants, to be described as ‘smart.’ (This in and of itself provides evidence of real-time, or at least present tense, discursive transformation: that which was impossibly stated prior to the rise of IoT is now a possible statement—'objects are smart.’ Although objects such as homes and cities can apparently be smart in the context of IoT, I maintain that such things must be considered couplings of subjects and objects, rather than objects alone and unto themselves. That is: IoT objects can no more be ‘smart’ in the absence of subjects that couple with them to constitute

‘things’ than the balance of one’s checking account can be described efficiently through imaginary numbers.) It is time, then, to turn to the other nineteen terms that comprise this topic, constellated under the umbrella of ‘smart,’ so as to better understand this transformational process: hints at the processes by which objects become ‘smart.’

Of primary interest are the terms ‘cities’ and ‘home,’ as well as their variants, and those terms that shed light onto the means by which these objects demonstrate ‘smart’ qualities: ‘energy,’ ‘tech/technology,’ ’sensors,’ ‘arduino,’ ‘power,’ ‘automation,’ ‘wifi,’ and ‘system.’ Cities and homes are places—and by that, I mean they are concepts with placeness. Their placeness includes the greater, although artificial (Simon, 1996) environments in which humans live and work and play and sleep. Resident in the relationship between ‘smart’ and ‘city’ and ‘home’ is the presence of the human, a subjective actant. Again, as with our initial discussion of ‘smart,’ the term’s application to objects (or collections of objects as in the case of ‘home’ and ’city’) flirts with the barrier between the subject and the object: it resides in the liminal space between the two, perhaps as a connection or semantic binding agent. This brings us to the secondary terms mentioned above.

That ‘energy’ is weighted more than those terms that follow it indicates that smart homes and cities are primarily ‘smart’ in relation to energy consumption. One assumes, then, that a smart home or smart city uses energy in a more efficient manner than non-smart homes and non-smart cities. One further abduces that in being ‘smart,’ these objects, these homes and cities, are embedded with human values and further designed by way of being ‘smart’ to bolster those values, such as eco-friendliness. The presence of ‘earthday’ within this topic further indicates that the ‘smart’ quality of cities and homes is somehow related to a set of human values that is to be retro-fitted by way of ‘smartness’ to certain objects in order to paint them in an eco-friendly light: that in becoming smart, homes and cities will leave less of an energy footprint in the greater ecology

of actants (both animate and inanimate) that contains them. Such attention to ecological impact is also possibly implied through the presence of the term 'system,' although this noun may well have a double meaning, referring at once to the greater ecological system that contextualizes a given smart home or smart city, and also to those constellations of technologies that ascribe to a home or city the qualifier 'smart.'

A certain agency presents itself in this topic as well. It does so through the terms, 'make,' 'survey,' 'automation,' and 'arduino.' From the start, one sees that the term 'make' implies interaction between a subject and an object: the subjects acts upon an object or set of objects so as to 'make' something, to produce some actant, some other object to be enrolled into a values-based vision of the artificial world even as it overlaps with and indeed consumes (by way of naturalization) the natural world. (I contend that this 'object-actant' that is made is the very essence of the 'thing' in IoT, but this will become clearer later on with the discussion of 'sensors.') A similar sense of agency is present in the term, 'survey.'

The term has its roots in reference to vision: one surveys the terrain, surveys as to navigate or way-fare or assess some quality of the environment. We find in the term's visual roots yet another resonance with the theory of affordances developed by James Gibson, which arises out of his theory of visual perception. But where 'survey' meets 'smart,' we move one step beyond Gibson's theory of affordances, beyond the realm of pure interaction derived from direct perception, to the point where direct interaction with the environment becomes abstracted into durability through the process of inscription. We move, then, from Gibson's theory of affordances to the aforementioned quagmire of Bertrand Russell's dichotomy between 'knowledge by acquaintance' and 'knowledge by description.'

In the act of surveying, a subject-actant exerts some mental control over their environment, if only by the act of visually cognizing it, and through the act of visual cognition, produces durable knowledge about that environment. (Durable, at first, insofar as the brain and the body are durable to the extent of a human lifespan; durable in a secondary fashion if that knowledge is coupled through inscription with an extra-bodily substrate such as stone or paper or silicon.) It is, indeed, a tangled web that characterizes the in-situ, acquainted thinging that takes place when a subject-object dyad is formed to comprise a 'thing' by way of actionable possibilities and that 'thing' is represented through inscription so as to be made durable across time as a form of description. All the more so when one takes into account another resonance of the term 'survey:' to gather data, or to capture it from the world thereby creating that oxymoron 'raw data' (Gitelman, 2013), or what Johanna Drucker refers to as capta (Drucker, 2014).

Within this particular resonance of 'survey' we find again a troubling dichotomy between the internal and the external, between the archived and unarchived, the body and its environment. We find, as with the term smart, a liminal interlocutor, an ontological stowaway sleeping in the cracks between subject and object, linking them in its dreamlike status as an unmarked category. Whether through the use of 'arduino' boards or 'tech/technologies' in the form of 'sensors,' the 'smart' quality of IoT objects places them in the space between what is and what might be, in the very realm of affordances that arise between a subject and an object and thereby transform them into a thing, into a hybrid of subjectivity and objectivity: a couple.

That such smartness is bestowed on collections of objects such as the home and the city (however impoverished that definition of home and city is) implies that the 'things' of IoT are not necessarily—and likely never—solely comprised of one subject and one object. That is, in the heterogeneity of objects (and subjects) comprising a home or a city, 'things' arise in myriad

constellations of subjects and objects, both plainly visible and obfuscated. The dichotomy of the visible and the invisible comes to the fore in the terms ‘sensors’ and ‘system.’

Systems, of course, have visible components. But systems also, of course, are known to demonstrate ‘emergence,’ or (roughly) unforeseen outcomes based on the interactions of their functioning parts. Emergent properties are invisible in at least one sense: they lurk as unforeseen, unknown outcomes of system functionality: our designerly eyes and engineering minds are blind to them even as our imaginations run wild in the process of building.

Sensors, too, are predicated on visibility and invisibility. They are designed in a certain way so as to be sensitive to certain, rigidly defined forms of input. But the notions of visibility and invisibility reach beyond mere prosthetic sensation and/or perception: that a sensor is designed to collect data implies that such data will be manipulated, analyzed, surveyed by certain competent actants. (Perhaps these are algorithms; perhaps they are analysts.) In that such data, by means of being ‘data,’ are captured for the purposes of analysis, this implies the presence of analyzing actants. Given the highly intertwingled nature of the social graph to which an earlier topic alluded, it seems unlikely that all such analyzing actants will be known to all others. That is, while I might enjoy seeing the progress towards health (or unhealth) on the output of my FitBit, I do not reasonably know what other analyzing actants have access to this data. Surely the FitBit Corporation—more on that term later—accesses my data, but with whom do they share it? In the meeting point of the terms ‘sensors,’ ‘survey,’ and ‘system’ one finds ample room for myriad unidentified, unidentifiable, and invisible actants that are inserted into the initial subject-object coupling that constitutes the ‘thing.’ The web of ‘smart’ along differing scales of IoT becomes only more tangled the more one digs into it.

Topic 5:

Security devices connected learning machine tech benefit privacy wearables mobile wearable cybersecurity technology cars car data health device running cyber

Now about the elephant in the room: security. I have, up to this point, largely and purposefully avoided discussing the discourse(s) of privacy and security. (Although, traces of 'security' were present in my discussion of the medical definition of skin analyzed in chapter two.) I can no longer, in good conscience, maintain this avoidance. It's right there, staring back. 'Security' begins this topic, and so we address it—but carefully as one might address the Gorgons: don't make eye contact for fear of permanent stasis.

Security might be interpreted as referring to a particular genre of human values. In this genre one might find terms like 'safety' or 'stability.' But I believe this approach is only partially correct: too often does such an approach to 'security' result in a quagmire of critique, a 'he said, she said' of pathological normality (Canguilhem, 2012) in which the 'he and she' in question struggle to maintain a possibly outdated and outmoded notion of security. That is, discussions of security tend to focus on maintaining a discursive homeostasis: *what is* and *what might be* are forcefully defined in relation to a past-tense sense of *what security has been*. To be sure, there is nothing inherently odd about this formulation: we understand the present and future as following from the past. But the conceptual placeness of the term 'security' confounds any sense of forward motion, of potential discursive transformation relevant to 'security.'[114]

[114] I have also largely avoided the topic of security in IoT because that is not where I am best suited to contribute to IoT scholarship. Works such as Smith's 'The Internet of Risky Things' already cover the ground quite well (Smith, 2017).

In this formulation, one begins to wonder whether or not the concept of security is anything but a placeholder for the insecure wish to maintain a status quo, to reside in the constructed 'good old days.' There can be no progress through the notion of security when 'security' refers to keeping something safe by means of exclusion, especially when that something kept out is a discursive transformation regarding the notion of 'security.' As with the violence of Derrida's Freudian archive, security protects itself from itself, does violence to the spectral possibility of discursive change by a reflexive folding: 'security' folds upon itself to protect its semantic content from change. Security is as security does.

The notion is like an alcoholic who seeks sobriety, a freedom from shakes and booze, by counting the number of drinks they have in a day.[115] In counting the drinks s/he does not have, a boozehound-turned-teetotaler is still an alcoholic because their sobriety is measured in terms of alcohol consumption (or the lack thereof). There is no escape from it because of the specter of alcoholism. The drunkard gains freedom from the category of alcoholism only by denying its relevance: this is not a mere abstention from imbibing, but a fundamental shift of frame in which that chilled shot of Stoli's loses significance through its conceptual excision from the drunkard's world. To frame the potential for productive discursive change relative to the constellation of statements that, in a gestalt-like way, undergird 'security' with the term 'security' is to sit at the bar jealously swilling club sodas and lime, all the while claiming to be free from the influence of alcohol. But still, there it is: 'security, devices, connected…' The combination of terms directly addresses the perpetual, cyclical hangover of discursive 'security.'

My path for discussing security, tailored to the armature of this work, is one of liminality and membranes, of the One and the Other, of the in-group and the out-group, and the physical and

[115] This is, admittedly, a harsh simile. I maintain its validity, however, because both alcoholism and preoccupation with security are pathologies that give rise to negative symptoms.

conceptual nature of that which divides any of those diametrically opposed dyads. According to the sketch of IoT provided by Chapter Two's literature review, as well as those topics already described in this Chapter, I will address the notion of security in terms of the subject/object dichotomy.

As 'things' change—by way of their subject-object compositions—so, too, do the boundaries between internal and external, of what is to be kept secure and what security is. As with the smartness of the whip-as-object born of the coupling of wielder and wielded, security is to be found in the coupling, in the affordance-like space of possible action that defines the relationship between a given subject and a given object. In the present discussion of 'security,' I will not speak of security's history—beyond an initial foray into its etymology—but rather its speculative futures: its potentials. By this I mean the ways in which the notion of security as it presents in the burgeoning archival corner of IoT might not resemble itself even though its semantic contents destroy its possibilities just as they protect its pasts.

The Oxford English Dictionary provides the following definition of 'security' as it appears in its present context:

> 2e. With reference to encryption, or telecommunications or computer systems: the state of being protected from unauthorized access; freedom from the risk of being intercepted, decoded, tapped, etc.

This definition is couched within three broader definitions:

> 1. The state or condition of being or feeling secure.
>
> 1a. The freedom from care, anxiety or apprehension; absence of worry or anxiety; confidence in one's safety or well-being.
>
> 2. Freedom from danger or threat.

In the terms used earlier, definition 2e is fundamentally about the One and the Other and the access that both have to that which is inscribed. Let's come at this concept through the lens of the first discrete category of technologies listed in this topic: 'wearables.' More specifically, let's consider a FitBit as a prime example of a wearable technology.[116]

A FitBit—let's say the FitBit Alta HR to be specific—is generally worn on one's wrist. (Earlier models were often carried in watch- or change-pockets or clipped onto brassieres.) To get at the complexity and quagmire of security in the imaginary of IoT, let's ask: What does 'security' mean in the context of a user who wears a FitBit Alta HR? The answer is manifold.

First, with regard to safety: a feedback loop exists between the user and their device. There is a certain security, or feeling of security, that arises in the act of wearing a FitBit. The addition of the device to one's *habitèle* (Boullier, 2014), signals a security against ill-health—a sort of activity-based piggy bank against the day of old age and degrading bodies. There is also in wearing a FitBit, dare I say, a certain sense of security against being left behind, being unable to keep up with technological trends. This could be thought of as the security of the status symbol, securing one's place among the current, the relevant, the planned-obsolete. But this is just one of two of the facets of security that arise when considering the nature of the subject-object coupling that comprises the FitBit as 'thing.'

A more formal facet of security, perhaps closer in relation to definition 2e provided above, is that of the security of the data created by the coupling of the user-subject and the FitBit-object. To approach this facet, we must first demonstrate that the primary functionality of a FitBit is not to be worn, not to improve the wearer's fitness, but rather to collect data.

[116] Chapter Six includes a detailed analysis of several aspects of FitBits, as well.

The role of data in defining the identity of device-object, the proto-thing awaiting coupling with a user-subject, is glaringly present in its name: FitBit. The portmanteau of the concepts 'fitness' and 'bits' signals a relationship, embodied by the device it describes, between someone's fitness (presumably the subject-wearer) and the collection of digital data, or bits. But names can be deceiving. The object-device's name signals only the designers' intent on evoking a relationship between fitness and the collection of data—health through quantification. We'll need to eat a bit more to get to the meat and potatoes.

Consider the FitBit GUI, or more specifically, that a property of FitBit devices is the presence of a GUI. A graphical user interface is the smoke to the fire of data collection, and, as the saying goes, 'where there is smoke, there is fire.' That which is represented via the GUI, whether found on the screen of one's smartphone or laptop, or on the interface of the wearable device itself—scratched though it may be from commingling with change in pockets, bra clasps, or car keys—is necessarily the aggregate of data collected by the worn device. Whether it is steps, calories burned, weight lost or gained, or one's heart rate, all of it is data derived from the array of sensors and algorithms that comprise, in-part, the object-device, 'my FitBit.' Without this data, or some portion of it not narrower in scope than descriptive pedometric data, a FitBit would simply not be a FitBit. Therefore, first and foremost, a FitBit is a data collecting object. It's identity as a 'thing' carrying the actionable affordances of a FitBit is predicated on the data it collects rather than what one might do as a result of the feedback loop between the device-object and the wearer-subject.

If a FitBit, thusly operationalized, is first and foremost a data collecting device, then it becomes possible to zoom out to a greater level of abstraction in analyzing the 'security' of a FitBit. It is a security pertaining to data, to that which is represented to the subject-user by means of the GUI. This notion of data-based security blooms into complexity quite quickly: at a simplistic level, there

is the security that is maintained or sought between the wearer and the device; at the complex level, there is 'security' as a placeholder for the membrane that divides the dyad of the user-device from those individuals and institutions outside of the dyadic loop between wearer and device who/that might gain access to the data that is collected. (These individuals and institutions need not be thought of as black-hat hackers—it would be naive to assume that FitBit does not grant to third-person parties access to certain types of data.) This second form of security is 'complex' in the sense of complex systems because all the components of the system are not known: they must, therefore, be thought of as complex so as to allow for the logical possibility of emergence—of unforeseen outcomes based in system functionality that will trickle down to the subject-wearer, the object-device, and to any other institutions or individuals that commune in FitBit data.

In more general terms, the inclusion of the word 'connected' in this topic further highlights the complexity of security. As we have seen in previous topics, as well as the literature review presented in Chapter Two, the imaginary of IoT is predicated on connectivity. It is, I believe, unreasonable to assume that a historical-homeostatic definition of 'security' can be maintained in the context of pervasive connectivity. This line of thinking pertains if one considers the specter of catastrophe that arises, comorbid, with any designed technology:

> To invent the sailing ship is to invent the shipwreck. To invent the train is to invent the rail accident of derailment. To invent the family car is to produce the pile-up on the highway. To get what is heavier than air to take off in the form of an airplane or dirigible is to invent the crash, the air disaster (Virilio, 2007, p.10).

Or,

> When you invent the ship, you also invent the shipwreck; when you invent the plane you also invent the plane crash; and when you invent electricity, you invent electrocution… Every technology carries its own negativity, which is invented at the same time as technological progress (Virilio, Petit, & Lotringer, 1999, p.89).

Derrida's notion of spectrality, or that which is present by means of its absence, resonates through this thinking. In designing and producing the family car and thereby rendering it present -- in its functionality, the teenage mobility it allows, the money it earns for its producers... the generally positive reasons for which it is designed -- the designer is also producing an absence that is inseparable from the car, *necessitated and realized by* its presence. That absence is its breakdown or collision, its anti-lovers'-lane-moralism, the bankrupting of Detroit, noise pollution and air pollution in urban centers, etc. These are the specters of the invention, the ghosts of 'wicked problems' (Buchanan, 1992)

We come, then, to a paradox: IoT is predicated on connectivity; connectivity means (to a certain extent) extension and inclusion; extension and inclusion are antithetical to security, where security is defined as exclusionary. Security in IoT, then, represents the specter of the historical a priori from which IoT emerged exerting influence over the possible transformations IoT renders possible.

In terms more closely related to the example of the FitBit: in its efficacy, its presumed successful functionality predicated on the secure maintenance and reportage of fitness-related data, reside the specters of malfunction or hyper-functionality (Seberger & Bowker, *In Press*), of unwanted interlocutors or viewers, of health surveillance and therefore fitness-based subjugation. There resides absurdity in its purest form: alienation. The GUI of the FitBit Alta HR, for example, as well as subsequent models, can be set to display the wearer's heart rate. Given that these devices are worn on the wrist and also function as timepieces, one risks divulging an embarrassingly high heart rate to anyone who has a line of sight while simply checking the time. This is a relatively small instance of alienation, but it is alienation nonetheless: the act of wearing a FitBit can be

interpreted as an act of signification. It signifies the wearer's enrollment into the sociotechnical ecology of techno-mediated fitness; but such enrollment does not necessarily signify routine workouts. What results is a liminal state in which neither identity—that of the techno-mediated fitness junky or that of the unfit couch potato—truly fits. The wearer is neither here nor there, but stuck in the membrane that divides the two categories.

But still, even with the lurking spectrality of failure—an in-built, ghostly feature of any design—one finds a benevolent human value lurking in the string of words that comprises this topic: 'benefit.' It is a slippery word, to be sure. The age-old question resounds in its utterance: *cui bono*? To situate the notion of 'benefit' within a greater discourse in which 'security' takes a prime place is to muddy the value of 'benefit.' If, as I have argued, 'security' is always already defined by the negative space of 'insecurity'—that is, that the two are part-and-parcel and, like memory and forgetting, cannot reasonable or productively be addressed in the absence of the other—then the actants that 'benefit' from security must also include those that benefit from the catastrophic failure or wicked problems that arise from designed security. The road goes both ways, benefitting the white hats and the black hats just the same.

'Security' is about preventing Eve from gaining access to information (and therefore communications) between Alice and Bob. As such it implicitly refers to a barrier—physical or otherwise—that prevents Eve and the Other from gaining access to the intimate communiques between Alice and Bob (the One). But when Alice and Bob *and* Eve are core players, as they must be, in an envisioned imaginary of massive-scale connectivity—and where Eve has many placeholders in the form of sensor-imbued devices—then any discussion of security must be one that fights against historical-homeostatic notions of security. To prevent Eve from gaining access to Alice and Bob (the subject-wearer and the object-device) is all well and good when Alice and

Bob are self-contained actants; but to prevent access to Eve when she is a known, yet undefined, component of the object-device worn by the subject, is to move to Edinburgh expecting three hundred days of sunshine every year.

As concluding remarks regarding this topic: 'security' manifests as a relationality. That is, in the presence of such terms as 'wearable(s),' 'connected,' 'mobile,' 'car(s)', one deduces mobility and *therefore* relationally. Issues of security arise from the context of the relationship between user and device, user and environment, and device and environment. (Unfortunately, this issue of relationally brings to mind heretofore unsolvable problems that arose in the era of GOFAI, such as the frame problem [Dennett, 2017]). So, one might interpret the core of this topic, and indeed the core of discussions concerning privacy and security, to the durability and configurability of subject-object couplings: security arises as a problematic because it assumes stability, or durable and impenetrable relationships between a given subject-object dyad or set of subjects and objects. The connectivity of IoT, however, flies in the face of this particular flag. As such, I believe it is appropriate to engage in further analysis of the configurability and connectivity that underlies concerns of privacy and security rather than directly engaging in analysis of security *per se*.[117]

Topic 6:

Future blog wearables good post testing read systems work robots security solution case google robot startup step brand article video

[117] Security is a discourse that is not contained within IoT, but rather (through the works of security researchers) seeks to contain IoT. The two are overlapping, but fundamentally separate discursive constellations: IoT is about new constellations of subjects and objects; security is about wrangling those new constellations in such a way as to make them resemble known constellations. IoT moves forward; security holds it back.

As with Topic 3 (discussed above), in the sixth topic the reader is confronted with questions of media and temporality: that is, questions concerning the extent to which futures are communicated via certain forms of media, as well as questions of the durability of media formats across time. This is apparent in the presence of the first two terms: 'future' and 'blog.' In this simple dyad of terms, one finds the complexity of futures that unfold in the present tense of written communication: this is, in its purest form, evidence of the accessibility of a contemporary archive found somewhere just beyond the actions and intentionality of the social imaginary. The third term, 'wearables,' appears to confound this simplistic reading; however, recalling that a topic is comprised of co-related terms, it becomes apparent (or at least possible) that 'wearables' is a semantic stand-in for those technologies or IoT-enabled devices about which thoughts are communicated.

Pursuing this mode of analysis—dividing and conquering, as it were—it is possible to divide the terms in this topic into three related categories, each of which is represented by one of the first three terms. First: 'future.' This term largely stands on its own, serving as the overall descriptor for the topic. It is possible, however, to place the terms 'startup,' 'testing,' 'solution,' and 'step' within the category 'future.' The notion of a 'startup' is necessarily predicated on the shift from the present tense into a future tense: a company begins as a 'startup' and evolves into something greater. To 'startup' resonates with mechanized life, with computerized life: one assigns computational tasks upon 'startup;' one starts up an application so as to perform some kind of task; one starts up an engine as a prelude to travel or production. In each of these possible readings, these echoes of some central meaning, 'startup' refers to a state change that is undertaken in order to accomplish some future task. As was discussed in the analysis of Neil Gross's article in Chapter Two, the notion of a 'step' must also fit into the category 'future:' just as the semantic resonances

of the term ‘next’ in Gross’s statement, ‘in the next century…,’ imply a series-based understanding of the future tense, so, too, does the term ‘step’ in this topic imply a series that works in/towards the future.

That ‘testing’ and ‘solution’ fit into this category is somewhat less apparent. However, one needs only consider the goal of ‘testing,’ falling somewhere between a noun and a verb in the form of a gerund to illustrate its fit. One employs testing to evaluate: evaluation is necessarily a process of comparison, of comparing performance against expectation. (This is true in educational settings as much as it is in technological settings.) To expect, similarly, is a process that marries the long present tense—in this case a process of design and implementation, of realization—with a rubric-based set of goals, or performance standards. This rubric-based set, acting like an ideal, represents a potential state of functionality, of ideal functionality, that is measured *through* testing. Testing becomes, then, a functional gateway to measure progress as it unfolds in the long present tense. Within this long present tense resides the specter of the future: it is the obligatory passage point between action and expectation. One then produces a solution to any mismatch between observable, tested state and the expected ideal state; similarly, one can envision the realization of the expected ideal state as a solution itself.

With regard to the second term in the topic, ‘blog,’ one can construct a similar category into which other terms from the topic fit. A blog is most clearly a form of communication. As such, the second category of terms includes all communication-related terms: ‘post,’ ‘read,’ ‘brand,’ ‘article,’ ‘video.’ Each of these terms deal with the communication of ideals, of expectations. ‘Post’ serves as both a noun and an infinitive: one posts on a blog; one similarly reads a ‘post.’ The action of reading, broadly conceptualized, applies to the remaining terms as a means of interaction: one reads a brand so as to interpret the symbolic representation of that brand’s

products; one reads articles and videos to gain purchase on their semantic content, on their inscriptions. ‘Read’ then serves as a sub-category within the greater category of communication: it is the means of interaction that fosters communication.

Perhaps more interestingly—although we will return to the notion of interaction soon—this category pertaining to ‘communication’ makes overt reference to different forms of communicative substrates, or inscriptive carriers. As stated, these run from blogs, posts, brands, to more traditional forms such as articles and videos. It appears, then, that this topic provides the analyst with a basic, introductory set of communicative media that are used to convey certain aspects of expected futures. One begins to wonder whether or not the media formats, given that they imply certain forms of interactivity—those forms of interpretation or information receipt broadly covered under the umbrella heading ‘read’—limit or shape the types of futures that can be communicated. That is, are there qualities of video that allow communication of different characteristics of IoT futures than those readily represented in text? Similarly, do the differences in blogs and articles—differences most apparent in the formality of writing—perform similar functions?

Finally, we come to the third category found in this topic: that of the objects of communication. In this category, initially implied through the third term, ‘wearables’ one finds the following words: ‘systems, ‘work,’ ‘robot(s),’ ‘security,’ ‘case,’ and ‘google.’ This is perhaps the most heterogeneous collection of terms we have yet encountered. What binds them together is their relationship to the two categories already described: they appear as the objects of communication, those concepts that reside in the future of IoT and about which communications are created.

It would be, based on the depth of this topic, premature to undertake an analysis of the ways in which these terms are interrelated. Suffice, for now, to say that we have identified, through this

exploratory LDA topic model, evidence of a communicative structure pertaining to the realization of the imaginary of IoT. In this light, then, one finds the following formation: communications are produced in a present tense relative to a given technology, which in combination with other communications about other technologies, constructs a vision of the future—which might be said to represent the imaginary that gives rise to the future, the sense and sensibility surrounding the construction of the future through the execution of the present tense.

But back to the aforementioned notion of interaction: That other media formats are included in this topic, such as 'article' and 'video,' as well as means of interacting with them (e.g., the verbs 'read' and 'post') further indicates the role of the human interpreter and communicator in the construction and maintenance of the imaginary of IoT. More interestingly, however, in the inclusion of the verbs 'read' and 'post' one finds resonances with embodied cognitive science. The extent to which we interact with the semantic content of communication is, to some extent, necessarily impacted by the materiality of the substrates that carry those communications. This thought opens some very dangerous theoretical doors: what does it mean to interact with semantic content? What is the barrier (if any) between the semantic content of a communication and the form that communication takes? These are at once questions fundamental to the human experience and production of the documental, topical facet of the human archive—of inscribed statements that in their inscriptive formality allow for the creation of new statements—and to the very meaning of 'intelligence.' These are, indeed, strange waters.

In the feedback loop that one might envision between user/reader, communicative substrate, and semantic content inscribed upon that substrate, one sees a system. This system is complex. It is embedded in questions of cognition, of embodiment, and the enfoldedness of Cartesian dualism: the subject and the object are divided; *cogito ergo sum*. A great deal of work has occurred in the

field of cognitive science to argue against this simplistic view of intelligence. (See [Chemero, 2003; Malafouris & Renfrew, 2010, 2016; Penny, 2017; Renfrew, 2010; Withagen & Chemero, 2012.]) We see, then, that within the imaginary of IoT resides a potentially immense discursive transformation: that of the reconfiguration of the subjects and objects that comprise a 'thing' within IoT, and which questions or troubles the subject/object dichotomy that has been reinforced in contemporary understandings of mind/body relationships since the Enlightenment.

Topic 7:

ibm platform mobile windows app android watson raspberry aws cognitive build core development world raspberrypi apps cloud virtual web reality

Topic 8:

intel cloud jobs focus data center digital customer mobile time watch making real cut kids cuts schools smarter pcs experience

Topic 9:

Solutions dell microsoft azure partner technology sap program services partners teams nec analytics launches technologies smart startup solve global city

Topics Seven, Eight, and Nine are highly interlinked, as indicated by the presence of corporation names at the beginning of each list. While it would be possible to engage in a discussion or explication of each individual corporation's approach to IoT as represented by the modifying terms that follow them, a more efficient analysis—and, I believe, a more meaningful

one—comprises a simultaneous analysis of all three together. Such an approach allows for the deeper consideration of just what is meant by 'corporation,' the category to which IBM, Intel, Microsoft, NEC, and Dell most clearly belong. An understanding of the concept 'corporation' will situate the bodies within the greater framework of subject and objects that I have been building in the present analysis, and subsequent to findings derived from the critical literature review presented in Chapter Two.

This approach is directly contrary to that which was taken in the previously discussed LDA-based analysis of IoT (Bian et al., 2016). Instead of identifying corporations as actors within the broader category of 'business,' I seek to identify the relationships that exist between corporations as they are legally defined in the United States and the notion of the individual, the user. Contextualized by the Internet of Things, this relationship is assumed to be one mediated by an object: an object that couples simultaneously with an individual user and with the corporation that created it, that maintains the infrastructure upon which it is reliant.

In so doing, it will become possible to examine novel ways in which corporations function as actors (actants) within the greater ecology of IoT, existing not necessarily at a scale somewhere beyond that of the smart home or smart city (as in an entity that is responsible for the design and production of the devices that populate both of these scales), but at a scale more similar than dissimilar to that of the individual, the user. To undertake such an analysis, it is necessary to take a detour into legal theory. As the authoring of this detour occurs under the auspices of a dissertation for a US university, it will primarily concern legal theory as it pertains to the United States. (Although an analysis of the concept of corporation as it occurs in the European Union or Scandinavia would be highly interesting, it is simply beyond the scope of the current project.) Of particular interest is the notion of 'corporate personhood.'

Broadly speaking, corporate personhood refers to the contentious notion that corporations (in United States law) can possess certain rights that, according to the Framers, were to be bestowed to individuals—that is, to natural humans—by way of the ratification of the Bill of Rights. The inherent contentiousness of corporate personhood in American legal theory stems from what might be considered an oversight in The Constitution: it gives no mention to 'corporations,' even though entities resembling corporations had been in existence for a little over a thousand years.

According to the legal scholar Carl J. Mayer, the rise of corporate personhood in the United States can be traced to the late nineteenth century:

> […] to claim legal status, nineteenth century lawyers argued that corporations should be considered 'citizens' or 'persons' for application of various constitutional provisions. […] Most of these cases were decided early in the nineteenth century—before significant government economic regulation—and involved the corporation's right to sue or be sued (Mayer, 1989).

Mayer continues: 'The Supreme Court's most renowned decisions, however, were in the 1880s and 1890s, holding that corporations are *persons* for the purpose of fourteenth amendment equal protection and due process.' So, in the present moment during which our historical *a priori* is likely to be characterized by a fundamental reconfiguration of subjects and objects by way of the Internet of Things, we are already entrenched in a legal argument that is a couple centuries old.

The discursive construction of the corporation, however, is much older. One sees its age through its etymology: the Latin *corporare,* to embody*,* as well as frequent citations in the Oxford English Dictionary that stretch to the fourteenth century. The entrenched notion of embodiment that is central to 'corporation' is never far from even contemporary arguments about corporate personhood. In contemporary legal literature, three broad theories of corporate personhood are

generally held: ‘fictional entity theory,’ ‘real entity theory,’ and ‘nexus of contracts theory’ (Graver, 1999).

In these theories, one meets with an interesting reversal (or infrastructural inversion) between the Cartesian notions of mind and body: a corporation is necessarily embodied in some sense, tied as it is to the etymology of the term; but this embodiment is largely invisible, certainly untouchable. The body of the corporation is not unified. Although it might be symbolized in the building that houses it, in the contracts that define its functionality, even in the individuals that comprise it from CEO to mail clerk, none of these ‘bodies’ captures the essence of the corporation: not of them can be said to be the *body* that is corporated.

And yet, the corporation acts as embodied subject. It possesses agency that can be leveraged in the marketplace, in government. It builds a memorial archive unto itself in the form of documentation and paper trails, receipts and bills, charters, mission statements, memos. But do the file cabinets and hard drives and cloud-based servers that house these corporate memories constitute a metaphor for a mind of the corporate body? Does the commerce-based survival of the corporate body approach in some small way the notion of being-as-knowing so tied to the production of individual knowledge on a daily basis? The answer to these questions is uncertain: one could easily formulate positive and negative responses, both of which would need to be undergirded by lengthy qualifications.

The identification of corporations as actants in this series of topics presents as a meaningful frustration: it highlights the value of LDA as an exploratory method, particularly in producing a history of IoT in the long present tense, because it is both expected and unexpected. I am not so naive as to imagine a set of topics describing IoT-indexed tweets to be devoid of references to corporations; but I am not so wise as to know with any immediacy how to interpret these

corporations. What is known, however, is that the role of the corporation should be kept under close scrutiny in the analyses that follow in Chapters Five and Six. Through LDA analysis we have seen that corporations play a role in IoT; we have not seen evidence of exactly what kind of role they play. Suffice to say that the corporation, in more ways than one, begins to resemble a subject in the gathering of the IoT-enabled thing.

A note on Topic 9

Although the first term found in this topic is not a corporation, and therefore not apparently subject to the current analysis of corporations as fictional entities, the overall sense one receives from this topic does. That is, the internality and externality of embodied fictional persons rings throughout the topic in the presence of corporate names (‘dell,’ ‘microsoft,’ ‘nec’), functions carried out by such bodies (‘services,’ ‘analytics,’ ‘launches,’ ‘sap’ [which refers to a particular language through which applications are realized]) and the composition of individual actants or agents that work within the structure(s) of a fictional body: ‘partner,’ ‘program,’,’ ‘teams’.

In this topic, the interpreter is greeted with a bipartite glance at a fictional entity: its composition, or those visible and contractually defined characteristics that give rise to it in the first place, and also the functionalities of that fictional entity that are carried out based on agreements set forth in their contractual obligations. Ultimately what we are left with is a notion of corporate personhood that allows interpretation of the corporation as a particular ‘subject’ within the greater constellation of subjects and objects that comprise a ‘thing’ in the imaginary of IoT. That the corporation can be considered, in some lights, to act as a subject indicates that there may be reason

to develop a theory of affordances that arise between corporate subjects (i.e., fictional entities) and real-world objects—not to mention affordances between corporate entities, objects, and the subject-users of those objects.

4.4 Extended Analyses

This chapter has comprised an initial attempt at leveraging the exploratory power of distant reading, in particular LDA analysis, to perform an archaeology of the archive of IoT in the long present tense. I have argued that IoT can be conceptualized as a forward-moving social imaginary: at once a deeply held schema for making sense of and validating actions in the world and the modus operandi for effecting sociotechnical change—building a new layer of infrastructure.

This social imaginary, I contend, is a contemporary manifestation—one comprised of manifold, simultaneous, and possibly contradictory futures that have as their root a particular technologically driven modus operandi for living in the world, a sort of anti-absurdism that combats absurdity through its embrace—of our own historical *a priori* and the possible future *a priori* conditions to which it may give rise. In being a contemporary manifestation, and therefore subject to the temporalities and rhythms of those actants responsible in its maintenance, the imaginary of IoT becomes the logical site of discursive transformation, of the mechanisms by which, discourse by discourse, one historical *a priori* transforms into another. The sociotechnical imaginary of IoT exists as the dermal layer, the point of interaction, that separates and unites human subjects from and to the greater history into which they are born—a history that is as material as it is conceptual.

The first topic I analyzed demonstrated, after some interpretation, that IoT as a discursive constellation is concerned with the production of knowledge about the world. That is, IoT

(particularly through the presence and importance of the bi-gram 'big data') appears as a site of knowledge infrastructure, or an infrastructural layer of mediation through which data are collected. But more than that, it evidences that future modes of knowledge production are envisioned in terms of the received epistemic culture in which IoT was birthed: that of computerized empiricism, where 'computerized empiricism' is functionally synonymous with 'big data.'[118] IoT, then, is seen as an extension of this computerized empiricism, predicated as it is on the value and presumed validity of 'big data' despite big data's well-documented problems (boyd & Crawford, 2012; Jacobs, 2009). From this analysis we see that IoT is as much concerned with epistemology as it is with ontology: indeed, it seems to signify a discreet point of overlap between the two, where what is known to be in the world defines how the world can be known.

By way of a secondary finding relative to this topic, it is also apparent that at least some of the actants relevant to the future of IoT are companies, or corporations. While greater support for this finding—and a more nuanced statement of it—will follow from analysis of subsequent topics, that such a finding is inferable from the first topic is important: this is, after all, a question pertaining to the nature of 'things' in IoT.

From the allusion to corporate actors, we know that such corporate actors are involved in some way in the production of those 'things.' If, as I have already begun to argue, a 'thing' is born in the interactive space between a subject and an object (i.e., the set of affordances that arises as a result of complementary characteristics), the presence of a corporate actor in the production of a 'thing' is inherently interesting: to what extent are the actions of the corporate actant represented in the objects such a corporation produced? Is that the sole or even primary role that the corporate actor plays—to produce objects for consumption? If there is a role beyond that, then is the

[118] It is worth using an alternative term, rather than relying on 'big data,' because of the extent to which the latter term obfuscates the changes it effects on traditional empiricism.

corporate actor more directly involved in the affordance-based production of a thing? If so, then is the corporate actor a subject or an object? Is it something else?

That companies and corporations are implicated in the future of IoT, and therefore the potential historical *a priori* to which a realized imaginary of IoT will give rise, calls into question the very nature of the 'subject' that combines with 'object' to form a thing (and vice versa, assuming that it is too early to determine whether corporate actors function as subjects or objects). As described above, corporations are ontologically tricky things: in the eyes of United States law, they are neither individuals nor non-individuals, but reside somewhere between. But they are given certain access to and coverage from the United States Constitution, particularly the First Amendment, which ensures freedom of speech.

Because of this coverage—and in conjunction with the definition of 'things' that I have developed—I tend to read 'corporation' as an emergent form of subjectivity within in the construction of 'things.' That is, the corporation in the imaginary of IoT emerges as another form of 'subject'—categorically similar to, but separable from that of the human user—that couples with an object to produce a 'thing,' or set of affordances that give rise to potential actions. Where this finding becomes particularly interesting is in the idea that multiple subjects (e.g., a corporation and an individual user) can be coupled with the same object, thus giving rise to a mixed membership set of affordances: through this set of affordances, power is redistributed by the axis of the coupled object between user and corporation. The corporation designs the object, the object is used by a user, data about the user's use patterns (or data pertaining to whatever other phenomena the object is designed to collect) are then returned to the corporation, which then tailors the functionality of the object to unspecified functionalities.

The complexity of this loop between actants implied in the 'thing' of IoT is further indicated through the analysis of the Fourth Topic, which is concerned with the 'smartness' of objects. The attribution of the modifier 'smart' to objects appears to occur at various scales—at least two. These two appear at the level of the home and of the city. Although this is a somewhat predictable finding, given any familiarity with the extant literature on IoT, or, indeed, with IoT devices themselves, it is nonetheless important: that IoT is envisioned in certain scales helps to solidify a possible framework for further analysis. That is, the various implied scales of IoT potentially serve as a framework in which the actants involved in the maintenance of IoT, as well as the actants that are active in the imaginary of a future IoT, can be situated. From the (at least) two scales of IoT implied in Topic Four, one finds an armature for continued investigation. I will return to this notion following discussion of the remaining Topics.

In my analysis I demonstrated that the application of the term 'smart' to an object arises in part from the interstitial spaces between subject and object wherein 'smartness' occurs, as in the case of the whip. I argued that the term 'smart' when applied to an object indicates that the object tin question allows its user to demonstrate, through the use of the object, an above average ability to interact with the world. Given that the object is made 'smart' through its inclusion in a network of other network-enabled objects, one can only assume that objective 'smartness' is derived from that connection; moreover, that objective smartness, then, is derived from the analytical capabilities belonging to the corporations and companies that designed the object in question. Smartness, it seems, belongs to network-embeddedness of the object. From this initial finding, then, we can say that the constellation of subjects and objects that comprise a 'thing' undergoes a change in IoT. The dyadic, subject-object coupling of the pre-IoT thing gives way to a constellation of ***n***-subjects around a given object.

But this finding brings us to the most difficult topic in the analysis: Topic Five, which is concerned with 'security.' This topic presents as difficult not because of the author's aversion to discussion of 'security,' but rather because the very nature of the changes in the subject/object composition of 'things' in IoT is contrary to extant notions of security and privacy. Whereas security and privacy were discussed in terms of internalities and externalities, the very configuration of subjects around a singular object in IoT indicates that this formulation of security and privacy is no longer valid: one cannot design a secure and private 'thing' if the very nature of that thing enrolls additional subjects into its being. The internalities and externalities that govern the maintenance of security and privacy need to be renegotiated, redefined.

Despite the inherent contradictions already identified in the discursive makeup of IoT, all is not already said and done regarding the futures of IoT. Indeed, the widespread membership of 'future' in the topics derived indicates that much is not yet known or finished. Indeed, it is actively under construction. The site of much of this construction, as evidenced by Topics Three and Ten, occurs at the level of the daily, of interpersonal human interactions as they occur at conferences and industry events. The human user, that is, is not completely divorced from the imagined future of IoT, or, indeed, from its design. IoT, although predicated on a fundamental assumption of the human/computer dialectic (Ashton, 2009), is maintained and curated by human actors. To put it differently: even though the vision of IoT is based on the notion of an earthly electronic skin (Gross, 1999) and on the ubiquity and superiority of computer-collected data (Ashton, 2009), IoT is always already a human creation. For all of the implied rhetoric about the heightened efficiency of IoT-supported tasks and the greater accuracy of IoT-collected data, the IoT cannot reasonably displace the primacy of the human in the act of knowing the world. IoT is artificial (Simon, 1996), but in being artificial it is also necessarily a human production.

Finally, a more direct discussion of 'future.' As with the mode of analysis that allowed for the present identification and interpretation of discourses, IoT itself resides in a long present tense. The maintenance and construction of IoT from both individual users and less well-defined corporate bodies occurs in a constant feedback loop between the infinitesimal present tense—occurring at the super-human speeds of computer processing—and the myriad points at which the present branches laterally in thought to the past and to the futures. There can be no stronger evidence in my mind of the existence, then, of IoT as an archive-in-motion: a present, accessible, and observable Foucauldian archive that will undergo (and is undergoing) discursive transformation. It will be the goal of the next two chapters to identify and analyze the materially grounded means by which this transformation occurs.

As promised, back to the notion of scale as a framing device for further theorization of the imaginary of IoT and its potential manifestations as future historical *a priori* conditions. I have just discussed some of the actants identified in my topic model. At the broadest level these include subjects and objects. However, such a general level of abstraction does little good precisely because of its generality. But these categories of subjects and objects that couple in order to constitute things can be divided into more sensitive categories: the emergent category of 'subjects,' for example, includes such topically heterogeneous actants as individual users (i.e., humans) and less clearly defined actants as corporations, which as I have argued according to United States legal precedents, possess or are given certain qualities of individuals. It is possible, then, to infer that the notion of the subject—or of the individual—is proportionally flexible to the scale in which IoT is envisioned. Moreover, it is also possible that multiple scales of individual subjects—users and corporations and, for that matter, designers, marketers, etc.—interact within the context of a given scale of IoT. As with the case of the smart home that was central to Topic Four, for example,

the category of relevant subjects must simultaneously include both individual users (e.g., human residents of the smart home) and corporate individuals (e.g., the manufacturers of smart home devices like thermostats, vacuum cleaners, water monitors, and lightbulbs). That these corporate individuals must be included in the home-scaled category of subjects is not only true because they are the manufacturers of these devices, but because they are potentially actively engaged with the objects that populate a smart home. Such active engagement could take the form of access to, and analysis of, data collected via smart objects.

Beyond focusing on the subject-object relationships at the core of 'things,' it is also possible to use the three scales of IoT—the individual, the home, the city—as filters through which to analyze the potential futures that reside in each scale-specific imaginary, and, indeed, to identify in a user-based way whether or not each scale of IoT can be said to be functionally synonymous with the others. The logic underlying this statement is as follows: if 'things' are those actants that render IoT different from The Internet, then it is these 'things' that must be analyzed; if these 'things' occur across multiple scales, then each instance of 'things'—each discursive construction of 'things'—as they occur across multiple scales will either support or refute the assumption that IoT exists as a unified set of discourses, rather than a disjointed or fractured group of multiple sets characterized by ontologically misleading unisons.

Finally, it is also possible to approach the communicative means by which the imaginary (or imaginaries) of IoT is/are maintained in terms of these scales. Using the same logic as was applied above to the relationship between potential futures and the scales of IoT, it would be too simplistic, too prematurely reductive to assume that modes of communication are homogeneous across the three scales. Just as it is now necessary to analyze the types and characteristics of potential futures along the lines of each of the three scales of IoT, it is also now necessary to analyze the

communicative affordances of various media in terms of what they communicate about given scales.

This necessity, as was the case with investigative necessities born of the nexus of potential futures and scales of IoT, raises several key questions. The question that is first and foremost is as follows: Do certain communicative forms cater to, or tend towards, the creation and maintenance of different imaginaries of IoT? Are the potential futures embedded in the archival social imaginary of IoT the same across the communicative media that are used to disseminate them? While it is possible that a homogenous set of futures—and therefore one historical *a priori* characterized by a ubiquitously shared social imaginary—will arise across the variable forms of media as applied to the variable scales of IoT, I do not think it likely. Nor, given the empirical conservatism necessary to undertake this sort of exploratory and interdisciplinary research, do I think it prudent or wise to assume such homogeneity beyond, perhaps, one or two core attributes—likely grounded in the fundamental subject-object relationships that comprise things.

At this point, I hypothesize that within each form of communication and each scale of IoT, along with each combination of the members of those two sets, one will likely find different imagined futures of IoT. In either possible outcome—that is, whether or not our theoretical null hypothesis is accepted or rejected—the finding would be significant: if the answer is 'yes,' the same imaginary exists across each possible pairing of scale and media format, then this study will have demonstrated that IoT presents as a suitable example by which to identify and analyze some universal truth about the relationships between the act of communication and the emergent form of 'thing' that resides, fetus-like, in the present imaginary of IoT. If the answer is no, we will have gained significant theoretical footing in relation to the means by which discursive transformation occurs within an archive: if different forms of communicative media are capable of, or by their

very nature, communicate different possible futures, then it seems quite likely that the media format (the inscriptive substrate) used to store and transmit semantic material (communications) is an active mechanism in the occurrence of discursive transformation within the archive that extends itself beyond the walls of archives and into the realm of the lived historical *a priori*. In short: although the analysis that follows is risky, it is by the limited nature of its outcomes, worthwhile, bearing importance either directly to the realm of HCI and design or to the realm of archive theory.

I began this chapter with the assertion, taken from Benedetto Croce, that all history is a history of the present tense. In invoking this provocative approach to history, it was my goal to provide a theoretical framework for the use of distant reading as a means of contemporary historical analysis. With the rise of rapid-fire micro-blogs, the historian is provided with a novel opportunity: wide-reaching archival access in the long present tense. By this I mean, that the archive of documents pertaining to a certain topic is no longer built at the same speed with which dust collects on archival materials. Instead, archival documents (in this case, tweets from Twitter) are accessioned as soon as they are created and rendered accessible through the implementation of a scraper and some algorithmic textual analysis.

This presents as something of a reversal: if, for Croce, all history is a history of the present tense, then for the algorithmic historian, all history of the long present tense becomes a history of the recent past. For Croce, as for Foucault, history and historiographical analysis was conducted on documents that had been periodized in a certain way: they reached up from a past tense to be interpreted in the present and therefore to serve as a means by which an understanding of the past tense (of events) can unfold in terms of the present. In the novel formulation relevant to digital

history, to the world of massive-scale digital communication, the formula is partially reversed: given access to documents of the present tense, the historian reads them, dissects them, dismembers them into a previously imaginable but largely impossible new text: that of a topic model. In so doing, the analyst reassembles a text from the long present tense so as to observe and identify, describe and interpret the bones of its discursive armature. Access to this discursive armature flips the past-to-present formulation on its head: the vantage becomes one of present-to-past, where the interplay between the two is subtle, the membrane dividing them porous. Data derived from the archive of the long present tense can be leveraged to understand the contemporary historical *a priori* that bounds this long present tense. The history of the present becomes the history of the long present, and therefore a history of the recent past and the futures to which it might give rise.

This logic has profound implications on the theories of the archive presented by both Michel Foucault and Jacques Derrida. For Foucault, the archive was not conceivably accessible in its own present tense: archival analysis, his archaeological method, concerned itself with the *durée moyenne*, centuries and eras past. For Derrida, the case was the same, although he went a step further in tentatively identifying and describing certain archival forces that play out in a present tense: violence, both jussive and sequential. Notably, in *Archive Fever*, Derrida alludes to a line of thought otherwise undiscussed in which he briefly ponders the impact that email would have on the composition of the Freudian archive. In this way, Derrida falls somewhat closer to the line that divides media archaeology from Foucault's archaeology of knowledge, although Derrida's gains on this line are very small, indeed.

In demonstrating that the archive is accessible in its own long present tense, it becomes possible to theorize contemporary history—the development of sociotechnical systems, the development

and functionality of infrastructures, for example—in terms of the archive. Such an approach wrests some of the quantitative appeal and force of digital knowledge production, where big data has been called the end of theory, away from reductionists and the colonial empiricism of the computer. But it does so paradoxically: of course the approach I have taken leverages digital means of analysis; of course it verges on a 'big data' approach. It also, however, leverages these digital occurrences as a means to create something humanly interpretable: a new text. Through the destructive creation of this new text, it becomes possible to link contemporary texts arising in the long present tense to the greater history of the archive from which they arrive: in leveraging digital methods and their trappings to identify such a history, the notion that theory is dead by the hand of big data becomes patently false. Instead of a death of theory, one finds a relocation: it no longer resides primarily in the coldly empirical laboratory settings of controls and experiments, but rather takes up residence in the longer tradition of the humanities and the very basis for the humanities: the human archive. The practice of history evolves with the temporalities of the digital, the temporalities of the computer.

4.5 Back to the Thing and the Human

In terms of the broader arc of this project, these initial findings deserve further context. In Chapter Two, I claimed that an unexpected finding relative to my critical literature review was the general absence, or overshadowed presence, of the human in the scholarly discourse pertaining to IoT. This guided me to abduce that the discourse of 'the human' was always already contained within, or otherwise bound to, the discourse of 'things.' As far as an entrance into an emergent theory, this was just fine. At the present moment, however, and based on the results of the LDA-

based discourse analysis just described, there is more to be said of this binding between 'the human' and 'the thing.'

It comes as little surprise that knowledge about the world is produced through the construction of 'things.' Notably, however, this thing-centric interpretation of knowledge production is not relegated to the sciences or the humanities. Rather, through the lens of subject-object coupling, 'thinging,' one finds a suitable framework for a vast set of knowledge productive methods. In fact, through this conceptualization of knowledge production, one finds unexpected common ground between two popularly divorced methods of knowledge production: interpretation and the scientific method.

In both cases, subjects (i.e., analysts) couple with objects to create a statement based on what can and cannot be done by means of such coupling. It is interesting to think of each of these couplings—between, say, a biologist and his microscope, a chemist and her spectrograph, a literary scholar and their text—as an archive unto itself, ripe with possible and impossible statements grounded in the affordances that arise between the subject and the object in the construction of the thing. In this light, it becomes possible to imagine the archive as all around us, re-instantiated and instantiated potentially anew with each coupling of subject and object, each production of a 'thing.' With this in mind, it becomes equally possible to envision the act of 'thinging' as the locus for discursive transformation.

Each time, for example, a chemist engages with her spectrograph, she brings with her not only professional and scholarly training related to laboratory work and extant theories of spectrography, but also the (ostensibly and hopefully) rich memory of previous experience not directly related to spectrography or chemistry in general. It is possibly through the inclusion of such previous experience—black lights at raves in Saffordshire woods, the multi-coloration of Christmas lights

or the blue of Chanukah lights, passages in Proust and Sebald—that potentially new uses, new relationships with the spectrograph are born. While these new relationships do not necessarily indicate or lead to a true discursive transformation (i.e., a fundamental change in the meaning, power structure, and historicity of a given discourse or thing), it does hint at a minor discursive transformation, a ripple in comparison with a tsunami.

In the case of our fictitious chemist, the spectrograph becomes tied to, inserted into the network of memory and experience. It becomes another way to see not only the world of light, but to relate to previous experience, previous metaphors of experience. If the archive surrounds us, then we are each a doorway into an archive: a sub-set of the archive that we embody and experience through our daily lives. While the idiosyncratic and minor discursive transformation that arises as the result of seeing the spectrograph in a new, experiential light does not necessarily add up to an archive-wide discursive transformation, it is also not an act that can be categorically excluded from the set of discursive-transformation-triggering events.

A more concrete example might help explain: consider the case of the Trojan Room coffee pot. This story is well engrained in the computer science imaginary, so I'll only retell the basics here. The Trojan Room was the nickname for one of the rooms in the computer lab at Cambridge University. It also happened to be the room that hosted the coffee pot. (One coffee pot for a whole lab of computer scientists!) The room was something of a meaningful walk from the other rooms in the lab. Laboratory students and faculty became frustrated with the act of walking to get a cup of coffee only to find an empty pot and realize that not would their caffeine craving go temporarily unaddressed, but they'd have to engage in all of the requisite activities of making a new pot of coffee. This simply wouldn't do.

Two researchers, Quentin Stafford-Fraser and Paul Jardetzky, created a networked 'thing' to address this problem. In doing so, they created what would come to be seen as the first webcam. Through the use of a camera focused on the coffeepot and some programming, laboratory members became able to monitor the levels of coffee available in the Trojan Room. The 'thing' that was the coffeepot—recall the thingness of Heidegger's jug—was transformed into another 'thing.' It became a thing with a digital identity, a digital representation. Its 'thingness' was no longer relegated to the immediate relationship with the subject that pours an object from another object, but expanded to include an extended network of extra subjects: first, the webcam itself, which in this instance serves as a proxy subject, a proxy observer; second, the actual subjects observing the coffee pot by means of the webcam.

Not only is the constellation of subjects and objects implied in the construction of a 'thing' demonstrably more than dyadic in the case of the Trojan Room coffeepot, but a new 'thing' was also born: the webcam. Though this little object—so routine as to be forgotten, visible only when it takes the form of anything other than a dot at the top of an opened laptop—while not necessarily comprising a discursive transformation in and of itself, transformed several discourses through its creation: sex work would not, in future, always occur in a shared physical space as a result of the webcam; home security was no longer relegated to lock and a neighbor willing to look after your place when you're on vacation; long distance communication was no longer only possible through written text or the connection of disembodied voices via telephone wires. Through the creation of the webcam—easily, I think, seen as a direct precursor to the Internet of Things—not only was the traditional and direct dyadic composition of a 'thing' called into question, but many of the very categories of behavior that define the human as 'human' (i.e., sexual activity, safety and security, and communication) were transformed. The 'thing' effected a discursive transformation on the

experience of being human: 'the human' expanded into realms less explicitly impacted by factors of distance. The world got a little smaller, the reach of the human a little longer in comparison. The discourses of 'the thing' and 'the human,' if they were separate before, are demonstrably no longer separate; Heidegger's jug, or in this case a coffeepot, is no longer only a thing in relation to the pourer or the drinker: it is a thing in relation to a proxy subject, a prosthetic stand-in for one of the senses humans associate with most directly: sight.

In the context of the present state of IoT, the insertion of a proxy into an otherwise dyadic 'thing' comprised of one subject and one object, must be scrutinized in terms of different types of subjects. It's not just a question of one homogenous group of computer scientists watching the pot: through the expansion of the Internet of Things and the realization of the marketing value resident in data derived from IoT, the group of subjects capable of 'watching' the coffee pot (i.e., the IoT-enabled device) has expanded to include corporations, institutions, and governments. Now, in-line with Foucault's early thought regarding governments, this is not really a cause for concern: governmentality arose from statistics. Statistics, by their very definition, are inscriptive proxies for constituents. In the case of a 'smart government,' wherein constituents or concerns are given representation in a digital form and therefore potentially subject to algorithmic analysis, I do not think IoT constitutes a discursive transformation such that might bring about a fundamentally new historical *a priori* condition: this is just more of the same, but the same with more flexible and nuanced levels of granularity.

The same might be said of an institution—say, a university. Since at least the development of files, institutions have been bureaucracies. This bureaucratic state bears startling similarity to governmentality in its reliance of proxies. In this case, however, rather than statistical proxies, one finds documental proxies. Much, save for the level of granularity, remains fundamentally the same.

It is perhaps at the level of the corporation where observable discursive transformation occurs. As stated earlier in this chapter, corporations are really non-entities save for the contract that creates them and binds their actors' actions. The contract, in this light, becomes the documental locus of the archive of the corporation, itself one small section of the greater human archive. But with the rise of the Internet of Things—of proxies and representations—this is no longer the case. Nor is it the case that the archive of the corporation can be wholly represented by the institutional memory of employees, or the semantic contents of memos and reports and that most important of all modern formats, the file. Rather, the archive of the IoT-enabled corporation becomes the database: the store of representations of, and data derived from, real world entities that are connected to that database. It becomes the set of possible statements—actions and events—that the corporation might exercise relative to a given object-subject coupling; relative to a given thing over which the corporation exerts control or influence.

In certain scenarios, the database-as-corporate-archive is similar to the file cabinet as corporate archive. It holds inscribed information on one form or another of substrates. But in other, rather extreme, but no less real circumstances, the archive of the corporation extends beyond the database. Consider the example of Three Square Market.

Three Square Market was incorporated in the state of Wisconsin on January 16, 2015 by its principle agent, Todd Westby. Its formal referent within the Wisconsin Department of Financial Institutions database is 'Three Square Market, Incorporated.' (Actually, exclusive to the database instead of a human reader of the database, it is referred to as T065024.) It belongs to the sub-category of 'domestic business' within the super-category of 'business corporations.' There's not a lot that makes this small corporation noticeable other than a recent practice of implanting RFID chips in its employees.

A staff writer as thehustle.com (however unfortunately named their online magazine might be), describes the situation with such gusto that it bears repeating:

> Todd Westby never meant to build a global surveillance empire—he was just sick and tired of his soda machines breaking down on him.
>
> Yet on August 1, 2017, employees of Westby's vending-machine business, Three Square Market, gathered around a small table at their River Falls, Wisconsin headquarters. On it were three objects: a laptop, a bowl of tortilla chips, and a hypodermic microchip implantation needle.
>
> Dozens of cheerful midwesterners in blue-collared company shirts had volunteered to let their employer implant tiny microchips under the skin of their hands. The chips let employees open doors, log into computers, and pay for snacks using the company's proprietary vending machines.
>
> By the end of the day, 50 of the company's 80 employees had received RFID chip implants (Grant, 2018).

Aside from unusual resonance with Neil Gross's metaphor of electronic skin in terms of the Internet of Things, the example of the RFID-chipped employees at Three Square Market shines a new light on the notion of corporate archives. Rather than existing in the form of a contract, or representations in a filing cabinet, or representations in a database, the corporation actually crosses the skin-world barrier. Read in an admittedly bleak light—though I see no alternative light, unless one were to focus solely on the convenience of turning on a computer or buying a Diet-Coke with a wave of the hand—the RFID-chipped employees create a new sort of 'corporate thing.' And it is a weirdly heterogeneous 'thing.'

On the one hand there is the thing that is comprised of the employee-subject and the RFID-chip-object. On the other hand, there is the thing that is comprised of the corporate database and the RFID chip. (It is not entirely clear to which category—subject or object—either of these entities belongs. Both demonstrate characteristics of subjects *and* objects.) On yet another hand, there is

the compound thing formed by the joining of all three: a thing that is networked in the form of [(subject)+(object-subject-proxy)+(corporate subject)]. Now, based on the previous readings of 'the thing,' it doesn't seem possible that a thing can be comprised of three subject or subject-like entities. And that's right. Depending on the vantage—the directionality of this thing—there are never three subjects. One of the subjects begins to categorically resemble an object. If it isn't already clear, the subject in question is the employee.

It is worth bearing this chimeric state of subject-object in mind as my argument progresses over the course of this dissertation. There will be much to say about it later. Suffice, for the moment, to say that the RFID chip has, by way of its existence and use, managed to potentiate a transformation of corporations—a transubstantiation, if you will. No longer is the corporate entity extant only in contracts and the records of business dealings. Through the implanting of RFID chips in employees' hands, the employees themselves—embodied human subjectivities—are entered into the corporate database. Reciprocally, the database extends into the world, into the very viscera of those actants contractually obligated to work (for however many hours per day) on behalf of the corporation. Unlike previous technologies, like a timecard, however, employees do not simply punch out and leave their contractually obligated hours behind them: RFID-chipped employees literally carry the corporation with them—in them—when they punch out for the day. (Though they undoubtedly only wave their hands at a reader rather than punching out.)

What remains to be discussed in terms of bringing this chapter's findings back into the light of the relationship between the discourses of 'the human' and 'the thing' is the extent to which human subjects couple with objects to produce *new* things. By 'new things' I do not mean new in a strictly temporal sense: each formulation of a thing can be said to be the formulation of a new thing relative

to things that were formed prior on a timeline. By 'new things' I ultimately mean new discourses, or new discursive possibilities.

Several of the topics identified through the LDA analysis above reference not only the future, but also various forms of mediated communication. Topic Six, in particular, deserves further scrutiny in this light:

> Future blog wearables good post testing read systems work robots security solution case google robot startup step brand article video

I am particularly interested in the terms, 'future, blog, wearables, post, read, article, video.' If the thing is always comprised of at least a subject and an object, then the human couples with each of the communicative media listed to produce things: a wearable, a post, an article to be read, a video to be watched. These 'things' are born of the affordances that arise between subject and object; this realm of affordances, I posit, contributes to the ways in which the future can be envisioned. That is, a textual representation of a future cannot be the same as a video-based representation of the future: they inherently represent different futures because they prime the sensitivities of their readers/viewers in different ways.

We move, in the next chapter of this dissertation, to the analysis of those discursive constellations—those characteristics of the archive's latest manifestation, our own contemporary historical *a priori*—identified through the use of LDA as historical method. In so doing, I devote primary attention to the media used to portray the imaginary of IoT. The archive, after all, is always already comprised of inscriptions, ranging as they do from the human skin to paper to digital representations. Pursuant to the unexpected findings of the role of 'future' and particular media

formats (e.g., blogs, video, text), primary focus is given to the way that the imaginary of IoT—itself an enrolling guess at future state changes in the historical *a priori* from which IoT arises—is represented in marketing materials. Phrased another way, the next chapter will deal with how the creation of one thing in the form of a reader/viewer-subject and read/viewed-object influences the vision of future things, of the Internet of Things and just what 'things'—and therefore 'human'—might mean in those futures.

So, it is not only the content of these marketing materials that will receive analytical focus, but also the forms of interactivity that these materials allow: the affordances that arise between subjective viewer and the viewed object. If, as I have argued, the archive can be accessed in its own long present tense, then the need arises to account for the impact of the archive's instantiations, the media formats that bear inscription. The next chapter will do just that.

4.6 A Brief Review Before Moving On

In review: this chapter presented an analysis of a topic model describing a group of tweets scraped from Twitter over one weekend in 2014—a weekend that coincided with an industry-centric conference about IoT. Ten topics were included in this model; from those ten topics, six primary findings were presented. These included:

> (1) IoT is grounded in an historical *a priori* predicated on big data and the hyper-mediation and hyper-connectivity of the Internet—IoT, then, can be described broadly as a communicative platform that takes as valid, always already, the rhetorical value of 'big data' in the age of computerized empiricism, and thereby aims to permanently 'other' the human subject into the category of object in terms

of epistemology and ontology. In a world of IoT, we will know the world, as well as ourselves, through its/our objectification;

(2) the actants involved in IoT—that is, the actants that comprise both the 'actor-network' of IoT and IoT as a discourse network—run the gamut from that of the subject to that of the object, where subjects are seen to include corporate-persons and individual human users, and objects most clearly refer to the devices that collect data and act as interlocutors between (A) subjects and other objects and (B) subjects and other subjects—but objects also refer to the communicative artifacts, such as videos, blogs, and articles, that describe certain visions of IoT and therefore act as mechanisms of enrollment. (NB: As will become apparent, the notion of object-to-object communication is a fallacy: all objects that communicate do so on behalf of a latent or obfuscated subject, be they corporations or users);

(3) IoT, although usually seen from the vantage of the technological, is a social phenomenon, maintained through person-to-person communications (often one-to-many) in the form of conferences and mediated inscriptions (i.e., blogs and promotional materials); in being framed as a technical phenomenon, IoT is always already a social one by means of deconstruction: the social is the flip side of the technological coin, the balance without which the contemporary discourse of 'the technological' could not exist;

(4) the notions of security and privacy within IoT should be interpreted and interrogated via ontological analyses of the second and third findings: that is, approaching 'security' and 'privacy' from the vantage of known constellations of

subjects and objects (i.e., traditional 'things') is counterproductive because IoT itself is a promise of new subject-object constellations and therefore new forms of things: it promises its own emergent discourse network which, according to Kittler's theorization of discourse networks, will both bastardize and enrich various facets of the human, who—unless it is our overt goal as humans to disappear ourselves into a digital-technological absurdity—will ultimately still exist with drives to procreate and destroy, to live with and through, by means of, the media we create;

(5) the imaginary of IoT can be stratified into several regions, several scales: the first pertains to that of the (human) body; the second to that of the home; the third to that of the city. As with the ecological depths of oceans, however, each of these stratifications, each of these scales, is defined in an indefinite way: one might envision membranes (of pressure or of substrate) that separate each of them, but these membranes are not impassable. Indeed, it is the nature of these categorical membranes, the liminal spaces that (like the layers of human skin) constitute spaces unto themselves wherein the actants of one scale meet the actants of another and, also, of their own. As with the interstitial space between subject and object in which reside the affordances that define what actions can be taken, and therefore the characteristics of the thing created, it is necessary to approach the scales of IoT, and their constituent actants, by means of relationality.

The final finding presented in in this chaper indicates that (6) IoT unfolds in a long present tense. By that I mean that the imaginary of IoT is constantly maintained and negotiated through communicative acts, but also that the very speed with which IoT-based communications occur

subdivides the experience of the present into categories that are inaccessible to the human experience. In so subdividing, IoT creates a feedback loop between multiple present tenses (e.g., the computational present tense of nanoseconds and the human present tense of environmental and bodily context). These multiple present tenses unfold in a linear fashion as in that of inscription: I argue that it is within these feedback loops that the promise of discursive transformation is found.

In the next two chapters, I analyze several IoT-related promotional materials. These analyses are undertaken in order to understand the ways in which different media formats allow for different imaginaries of IoT as they occur across the different scales of IoT, and thus foster, through the relationships that arise between reader/viewer and inscribed object, different sets of imagined possibilities for IoT, or different future-potential historical *a priori* conditions. I analyze the ways in which the topical discourses identified and discussed in Chapter Four are present and active in two forms of communicative images: first, the subject-object coupling that results in observable, non-collocated communication. This form of communicative object, which I will refer to 'the image as thing' includes such things as the constellation of the subject-viewer and the object-viewed; however, the 'object-viewed' is not a simple as it may seem. It is not simply the coupling of a viewer with an image. An image—a two-dimensional reduction of a four-dimensional world—presents no affordances in and of itself. The affordances that arise between subject-viewer and object-viewed are not derived of the pictorial representation, but of the inscriptive substrate that carries that pictorial representation. Thus, the image-as-thing is comprised of the coupling between a subject-viewer and the object-viewed where that object-viewed is a gestalt sum of that which is visually represented and that by which such visual representation is embodied. In most cases, as we will see, this second aspect of the gestalt 'image-as-thing' is a digital computing device, such as a smartphone, tablet, or laptop.

What is required to analyze the relationship between the subject-viewer and the object-viewed in terms of the image-as-thing is an infrastructural inversion. The inscriptive substrate that carries the image must be foregrounded, or at least explicitly included in the assemblage of the 'image-as-thing.' This constitutes an infrastructural inversion because the inscriptive substrate is purposefully invisible in its role as image carrier: when we view a video that presents a representation of an ubiquitous IoT, we do not concentrate on the media that carries that representation—the smartphone, tablet, or laptop is invisible in its communicative-infrastructural role. But those devices are physical objects: they, in combination with qualities of the subject-viewer, give rise to affordances: what can and cannot be done with or relative to that image that is carried. In this way, the inscriptive substrate provides interactivity with the image, but it does so in a proxy way—in a type of transference. The interactive qualities of the inscriptive substrate are transferred to the image-based semantic content it carries. Thus, images that communicate a vision of an ubiquitous IoT are given the interactivity of the smartphone, the tablet, or the laptop: we see representations of the future via the affordances that arise between the subject-viewer and the object that carries the image. We funnel the future through the present tense; we see the future through the rearview mirror of our own present tense technologies.

The second way in which I analyze the presence and treatment of discourses identified in Chapter Four is through the technical image. Paradoxically, the technical image explicitly excludes the inscriptive substrate used to carry the image. That is, the technical image does not involve the smartphone, the tablet, the laptop. It is an affordance-free image; a proto-object that constructs a proto-subject. It is not 'technical' in the way we usually use the word 'technology.' The technical image, once divorced from the inscriptive substrate that carries the image-as-thing, becomes

something of a pure representation of the ways in which the image-as-thing will impact the phenomenological world once the future objects it represents are naturalized or rendered tacit.

In this way, through the comparative analysis of the image-as-thing and the technical image, we identify the locus of discursive transformation: the present tense relationship between a viewer-subject and an object-viewed, and the lateral present tense (an imagined proximal future) in which the proto-objects represented in the technical image are naturalized the point of invisibility akin to the invisibility of the inscriptive substrate in the image-as-thing.

In the next two chapters, I focus on the relationship between reader/viewer and mediated communication, but do so with an eye to the ways in which such notions as 'corporate personhood,' 'the future (and temporality writ large),' and 'things-as-subject-object constellations' are treated. That is, those concepts or relationships presented in quotes above appear as proto-discourses, each of which are affected and altered through the means by which their characteristics are communicated. It should be expected, then, that where the last chapter was rooted largely in Digital Humanities and Critical Discourse Analysis, this chapter will take a turn towards media and communications theory, informed primarily by Vilém Flusser (and influenced by Foucauldian and Derridean logics).

'Things-as-subject-object constellations' (i.e., the subject/object dichotomy writ large) are analyzed at two levels and then compared. First, these discourses are analyzed in terms of their presence in the image-as-thing: the extent to which they are present and malleable in the physical and real-time assemblage of subject-viewer and object-viewed, which is (again) comprised of an inscriptive substrate that transfers its affordances to the image it communicates. Second, these

discourses are analyzed in terms of the technical image: the possible future represented in the image when it is divorced from its inscriptive object.

To summarize: the imaginary of IoT is maintained and negotiated in a long present tense, during which multiple constellations of subjects and objects interact, and in interacting (via different modes of communications, via different mediations) limn the potential futures of IoT: these futures arise from the comparative analysis of the image-as-thing and the technical image. These futures constitute the silhouette of the potentially emergent historical *a priori* conditions to which IoT will give rise, and therefore the silhouette of what it will mean to be a human in and alongside the world of IoT—what it will mean to make the statement, 'I am human.' Through comparing potential futures with observable presents, it becomes possible to abduce the mechanisms of discursive transformation. It is now time to begin analyzing just how these different modes of communications and mediations structure the imaginary of IoT.

Chapter Five: IoT at the Scales of the City and the Home

5.1 Introduction

The second section of this dissertation began with a meditation of sorts: a consideration of the objects that surround us in our everyday lives. It then extended this meditation to consider the role that generic objects play in the stories that populate our lives, whether in the form of popular song, literature, self-help books, home or office furnishings. The introduction ended with the consideration of book as a physical metaphor for the container of narratives themselves.

I now begin this chapter again with the book, not in terms of the narrative it carries, but as an *object that carries narrative*. While all of the aforementioned modes of narrative conveyance are necessarily material—an *.mp3 file or a DVD, for example—books carry part of us with them. From stones, to codices, illuminated manuscripts to books of hours, and well into the digital age, books (or book-like precursors) have traveled with humans across millennia. So, we turn here, using books as a stepping stone, to narrative-conveying objects, as they appear to our senses, as they doubly populate the human archive; we turn to books, quite literally, as extensions of the human (McLuhan, 2016) that, through their extending functions, both narrate and constitute human history as an embodied history, and set the tone for post-extensional perceptual prostheses.

Books are perhaps the most traditional of communicative media—at least, they are most clearly tied to the oldest forms of inscription, having a bloodline possessed of clear markers dating back to chisels etching into stone and clay.[119] Indeed, it is possible to perceive of the discursive constellations and sets of the human archive as stacks of pages waiting to be assembled into book form, to be bound and stitched, printed and sold as narratives of this or that portion of history; to be internalized and tacitized in their relationship to the human-body-as-medium, mind and

[119] For the moment, I will sidestep the Kittlerian distinction [Krämer, 2006] between scroll and codex, choosing instead to lump all inscribed material into the same, broadly inclusive category. Just as Derrida said in Archive Fever, 'Stones speak!' {Derrida, 1998, p.93], here I say, 'Let the inscriptions speak!'

intestines and all; to be rendered as curated playlists not wholly unlike excerpts organized in a commonplace book.

'Book' becomes, or has become, an indelible metaphor for external memory, for the extensions of memory upon a substrate that is more durable than the media of the human body. Ancient Egyptians had 'The Book of the Dead' to preserve the dead, to register them as living on; William the Conqueror commissioned the Domesday book to wrest control over a newly conquered population; governments retain paper birth and death certificates filed in massive cabinets, stand-ins for binding that could never keep up with the population boom; parents of children in my generation often retain pre-fab diaries pertaining to their children's childhood. We speak in song of living as a means of writing: 'Everyday I write the book,' Elvis Costello said; The Kinks reconstruct (or construct for the first time) a post-Victorian English nostalgia of beach holidays and knees-ups in 'Picture Book.' Indeed, the double-LP and the CD case even approach the form of the book, being opened to reveal not only their encoded audio content, but often liner notes and images.

But tied as the notion of the archive is to such topically outdated media as mere 'books,' the archive does not (and logically cannot) begin *and* end with books, or the material form of the book. It begins with the human body, which contains the possibility of the book-as-medium; it continues on in the spectrality of the book-as-metaphor: an object once and forever with us, but changing in its metaphorical reach. The human archive, and therefore the metaphor of the book, is in motion (Røssaak, 2010); it is a system or set of discourse networks (Kittler, 1992), magnetized for attraction or repulsion between themselves. But the book as object-metaphor lingers as a specter of the archive; the archive, too, as a specter of the book.

Within the broader set of materialities contained in, or referenced by, the metaphor of the book, consideration must be given to other forms of archival documents, members of various discourse-network sets—not *only* in terms of their role in documental archives, but their accessibility outside of archives in the abstracted, yet lived-in, realm of the human archive. By this, I mean the world in which we live our day to day lives, but which is also tied by knots of varying strength to certain histories and cultures (and therefore to a set of potential futures), the path dependencies and historical decision trees that arise from certain discourse networks.

The world presents in varying forms, each aligned with the physical, temporal, and communicative qualities of certain discourse networks: that which recedes or disappears from the vantage of the human through the rapidity of the computational time axis is mirrored by that which, by virtue of biological imperatives and emotionality, recedes into computational-experiential invisibility precisely because computers have no imperative to 'feel.' *L'Un se garde de l'autre,* Derrida said (1998, p.78). Humans are simply not computers; computers are simply not humans, try though we might to reduce the ontological distance between the two.

In the sixth topic discussed in Chapter Four, the notion of the future was included alongside the notions of various media formats. The discourse of the future, then, might be interpreted as subject to the various media formats used to represent it not only in an historical sense—as in inscribed records of what happened—but in terms of how we represent futures, how we tell their stories. Even as we shift to new materialities—into the futures potentiated through technical images (Flusser, 2011b), or into the realm of the post-analog (Kittler, 2017)—the book lingers. It remains, like the palimpsestic magic pad for Freud (Derrida & Mehlman, 1972), a foundational metaphor for the very structuration of the human archive as it extends beyond single generations, for representing histories both past and future.

Given that the archive is now in motion to an extent perhaps greater than any seen before as a result of the heterogeneity of inscriptive materials (and the collapse of time axis manipulations from codex to gramophone to computer that this heterogeneity brings about) it becomes necessary to move beyond the book to the image: to images, both moving and still, of IoT. Such a move forward is a move that analyzes substrates as carriers of information within *the archive* comprised of discourse networks, but also analyzes how readers, or users of the documental archive—interpreters, interlocutors, narrators—*living persons, those bodies so absent from certain strains of media theory*—interact with these substrates, these prosthetic extensions; how readers and viewers, interpreters and reciters, gain access to the symbolic, semantic, and real content inscribed upon or captured by substrates via the material qualities of those substrates.

Questions pertaining to the comparative interactivity of various media formats arise because of the temporality of IoT: as I have stated, it is a technotale with a future orientation. We have seen several framings of IoT in the near future (e.g., by 2020, by 2025, by 2035, etc.). In order to produce statements about a future, one has to compile these statements based on what is possible in terms of the archive: one might easily say that the future will arrive as if dropped from the sky, including teleportation, Jetsons-like meals in pill form, etc. But these statements would be ridiculous: they would be stories rather than possibilities grounded in a path dependent set of historical trajectories.

So, then, we must look for a link between the ways in which the future is represented via available archival-documental materials—statements and events including media formats themselves—and the characteristics of representations of IoT's futures. If, as I have argued, the 'thing' is comprised of a gathering of at least one subject and one object, then the futures of IoT—their representations—are things, too, comprised of a subject (e.g., a reader) and an object (e.g.,

material inscribed on a substrate, or semantic information carried via a given substrate). Future visions of IoT are things then, too. The nature of these representational, communicative things—the extent to which subjects/reader interact with objects/inscriptions—logically impact the characteristics of the futures they represent. The represented future of IoT is only as rich or expressive, as interactive or limiting as the media formats used to convey it. A textual, written future differs from a future of still images; a future conveyed via still images differs from a future conveyed via film. All inscribed futures differ from embodied futures until the point at which inscription meets body in a present tense.

This is a particularly McLuhanian notion: the medium is the message (McLuhan, 2016). But in this instance, the temporality of the message is uncertain: it is both a message that is played out in the present tense (as any read or viewed message must be given the temporal boundaries that define the human reader or viewer), but it is also a message that plays out in a lateral present tense: a present tense that contains projections of the future. It just so happens that the message here—the media used to convey other media—is the potential discursive construction of the future as it relates to the media formats that convey its potential characteristics, all of which are ultimately carried in and by the human body and the archive that it creates. Just as McLuhan riffed on his statement that 'the medium is the message' with the idea that 'the medium is the massage'—a massage that works us over completely as in the hands of the masseuse—so, too, are we, in constituting future-representational things, the massage of that future: we work it over completely via representing it through objects with which we couple to constitute future-oriented 'things'—things that carry narratives about the future.

Paradoxically, we complete this 'working over' in a limited fashion. We have only those objects that are known or knowable with which to couple; but in this coupling, the potential for

new ‘things’ emerges. We must assume, then, if we are to adhere to the logic that has defined this argument, that the emergence of new ‘things’—the transformation of discourses—occurs in an incremental way, rather than all at once. Based on speculative deduction from this premise, discursive transformation is inherent in any designed object: objects take on lives of their own once they are released into the world of ‘use.’ These lives—the potential ways in which they are used according to the affordances that arise between object and subject—contain multitudes of minute variations in use, where ‘use’ not only resides at the level of the thinging dyad, but also in the greater ecology of infrastructure, cultural practices, and material grammars.

In still another potentially confounding turn, it is not enough to simply analyze the material and temporal characteristics of media representations. Such an analysis must also occur in terms of the ontology of the representation and the epistemological effects such ontological characteristics beget: for present lack of a better term (and by way of an introduction to that better term) we can think of the ontological state of a representation as falling into the two categories proposed by Herbert Simon (1996): the natural and the artificial.

For the sake of argument, let’s assume the production of the artificial is a natural occurrence for the human.[120] That is, the production of artificial objects—those objects that do not occur but for the processes of design and engineering and production, from the wayfaring vessels of the South Pacific to flatscreen televisions—is an activity that is wholly contained in the category of natural actions a human might undertake. Where artificiality becomes particularly interesting in this framing is when artificial objects begin to feedback into the natural world in wholly artificial

[120] This is the same logic that allows for the argument that extensions of the human predicate prostheses: that extentions and prostheses are dichotomous ends of the same spectrum, which, in its entirety, represents and contains the breadth of things.

ways. (This is the point where extensions *become* prostheses.) In the context of IoT, they appear to do this through the collection and analysis of data.

When we interact with an object embedded in the IoT network, we interact with an object that exists in perhaps, and paradoxically, the purest form of an object: an object that objectifies through the collection of data from sensors and actuators. When we develop world views—imaginaries—based on the representations of the world created through objectivist collection of data—or, indeed, created with this type of IoT-enabled data collection in mind—we diverge more and more gradually from the possibility of living in a 'natural' world, or living in a world where the distinction between extensions and prostheses remains valid. We become 'natural' only insofar as the measured world is rendered natural through its (denaturalizing) measurement; we become artificial through the very act of becoming 'natural' because the means by which we describe natural phenomenon as such is an artificial act: it is an objectivist act, a reductionist act. It is the new science of both the dawn of the modern era and the very present tense in which we find ourselves.

Earlier I alluded to the existence of a better term for the type of artificiality I have described. That term comes from the work of Vilém Flusser (Flusser, 2011b): the 'technical image.' Rather than diving directly into a discussion of the 'technical image,' I chose to couch his concept in the work of Simon in an attempt to demonstrate a discourse of change, of transformation, that subtends the work of scholars in such (topically) desperate fields as systems science, media studies, communication, and science and technology studies.

This move is a rhetorical one: each of these fields can be seen to fit into the greater documental and documenting archive, the greater historical narrative and set of possible statements in which we live. Each of these fields is also, then, potentially driven by an underlying set of mechanisms:

this set contains not only 'the thing' and 'the human,' but also the fundamental notion of transformation. Without transformation there is stasis; with stasis there is no history; with no history there is no human.[121] In order to understand what it might mean to utter the statement, 'I am human,' in the futures of IoT, it is therefore necessary to understand the mechanisms by which discursive transformation occurs: this transformation is the engine of history, the modus operandi writ large for the experience of being human. Given the logical framework I have developed, discursive transformation must occur in relation to the construction of 'the thing,' if to be a human grounded in history is to be embodied in relation to an environment of objects that exist across time and to represent those relationships through inscriptive media.

5.1.1 Back to the Book

But still, even with the thought of the technical in mind—in both senses—the book looms. The written word is still the *lingua franca* of media studies, of informatics, of any and every branch of scholarship: all must be translated onto the page or the screen. We live in a world populated by myriad forms of the written word, the ecology of which extends well beyond the formal edges of the page: text messages, blogs, graffiti, customized license plates, fliers, posters, billboards (both painted and digital, smart and static), push notifications, zines, microblogs, journal articles. The list could go on: receipts, emails, user license agreements, street signs, prescription labels, nutritional information.

These written bits reach back from the realm of the symbolic into the realm of the real, the realm of the phenomenological; they do not end with their inscribed materiality, but rather

[121] A human without history would not be a human as we have come to know the term. It would be a human outside of history, outside of the archive: a human prior to the de-naturalizing of the world that emerged with language and image.

prescribe and proscribe action that we may take or may not take relative to making sense of their semantic content. The symbolic guides the real just as the real guides the symbolic. (Indeed, I am tempted to argue for the ultimate uselessness of this dichotomy—real or symbolic, all must somehow play roles in the realm of the lived, the living world of the mundane.)

To these written forms that reach from the symbolic into the real must be added various other forms of media that reach from the real into the real again via the symbolic: the moving image, from the humble YouTube clip and the GIF, to the venerated forms of high cinema and visual art installations and stage design at The Met. To these, also, must be added the static image—although it initially pales in comparison to the grandeur and impact of moving pictures (one might suggest that 'movie' describes all of those forms described above) it is still the primal stuff of visual communication. Importantly, the real-to-real (if you'll forgive the pun) passes through what Vilém Flusser described as the universe of technical images: image-capture-creations of a real world that is somehow beyond the grasp of the human; a real world that is constructed around the human archive, but to which the human must adapt given their adoption of technical-image technology. We see the world backwards and sideways through the visual filters of the technical, painting the tableaux before us with otherworldly images to which we must naturalize. Indeed, we must go further to include the *physical* image: that of packaging, of forms, of geometries in the world, which brings us back, in nearly full circle, to the affordances that arise between subject and object based on the overlapping characteristics of both.

We need not delve into Flusser's notion of the universe of technical images to see the point: to the extent that print culture has adapted to the Internet, it has done so by way of the static image: the webpage as visual image; the splash page as billboard; tweets as lines in a universal scroll-codex chimera, spat out (as by a teletype) at a speed all its own, defined only by the users that

socially co-author a text with no known point, no moral, no climax or denouement. The boundaries of our smartphone screens serve as frames: even the moving image is static in its containment. The interface becomes the communicative medium and mode in question.

The realm of the communicative is vast, even foreboding. One is tempted to overestimate the heterogeneity of communicative forms, even while attempting a productive comparison of them. But in resistance to this temptation, I turn away from an all-inclusive analysis of the readerly or viewerly affordances that arise between subject and object (between reader/viewer and read/viewed) to an analysis of those forms identified as relevant in the previous chapter. That is, I begin with the modes and media included in Topic Six from Chapter Four:

> Future blog wearables good post testing read systems work robots security solution case google robot startup step brand article video

I begin with components of this discourse—which we might possibly call the discourse of discursive transformation, given its grounding in the future and media representations thereof—in terms of one theme that emerged from analysis of other topics: that of scale. We might readily divide the discursive constellation of IoT into several scales based on the topics derived in Chapter Four: that of the human body; the home; the city; and institutions (i.e., the corporation).

In what follows, I begin analysis at the level of the city. I then move downward in scale to the home and finally the body. My reasons for beginning at the level of the city, and not the institution—which might be thought of as larger than a city—are as follows: given the problematic operationalization of a corporation within United States law (e.g., is it an institution? Is it an individual?), I am not willing to assume that the corporation exists at a scale larger than that of a city. Rather—and in line with Donna Haraway's recommendation that researchers 'stay with the trouble,' but not in a way that relies on 'a vanishing pivot between awful or Edenic pasts and

apocalyptic or salvific futures, but as moral critters entwined in myriad unfinished configurations of places, times, matters, meanings (Haraway, 2016)—I investigate the corporation as an individual that is active in the construction of 'things' at all other scales that were present in the findings of Chapter Four: the city, the home, the body—each of them unfolding into a future tense through the media formats used to describe and represent its imaginaries.

So, this chapter constitutes a double shift: on the one hand, we move from discussion of topics and models to discussions of how the topics presented in our model are represented in 'the real world' in the form of symbolic communications that inform the real; on the other hand, we move from analysis of the tweets that gave rise to the aforementioned topic model to those other forms of media that were indicated in the topics that comprise the model. It is one thing to say that IoT can be interpreted as a set of discourses, or indeed as a novel discourse network unto itself; it is another to demonstrate the theoretical benefits of approaching IoT in terms of these discourses. This chapter, then, is a turn towards interpretive action, towards interpretive application: this is a turn to the media that carry the possibilities of IoT on them in the form of inscription: blogs, wearables, posts, systems, brands, articles, videos—all with an eye to the futures they create and destroy.

5.2 IoT at the Scale of the City

Outside of the scholarly literature, the imaginary of IoT is most readily approached through marketing and advertising pieces relative to certain technologies. Just as Taylor (2004) noted that the social imaginary is not *of* theory, relegated to the rarified walls of Research and Development departments or Schools of Information and Computer Science, but rather found in the daily life and minds and experiences of individuals, one cannot hope to approach the sociotechnical

imaginary of IoT through an analysis of the scholarly materials about it. Here, then, I turn attention to various media used to advertise IoT products and services, and therefore facets of the imaginaries that reside in IoT.

5.2.1 Video Analysis: "What Does the Internet of Things Mean?"

On March 14, 2014, the Intel Corporation (Intel) published a video on Youtube. The video entitled, "IoT Intel - What Does the Internet of Things Mean?" functions as an introduction to the concept of IoT.[122] I was first made aware of the existence of this video through an email blast sent from information@intel-designcenter.com via plan.intel.com on July 21, 2015. (I had previously subscribed to receive emails of this sort during my affiliation with the Intel Science and Technology Center for Social Computing at the University of California, Irvine, although I am not sure of the exact date on which I subscribed.) The subject of the email was "The Internet of Things: What does it all mean? [Video]".

The most apparent reason for choosing this video as an entry point to deeper analysis is, of course, that the video was written, designed, and marketed as an introductory piece about IoT, as denoted by its title. It is intended to provide a more or less naive reader/viewer with the requisite information to begin envisioning a future characterized by IoT. Additionally, but of equal importance, the video exists as part of a textual ecology to which access is reasonably easy.[123]

Analysis of the video alongside analysis of the textual information that accompanies it will allow for a broader, more contextualized understanding of the basics of IoT—not necessarily in

[122] https://www.youtube.com/watch?v=Q3ur8wzzhBU

[123] Ease of access is not merely a methodological boon. That the video is openly available to any viewer via YouTube indicates that it can accurately be considered part of the greater social imaginary: it is not hidden behind a paywall, accessible only to scholars or researchers, but, rather, accessible to anyone who wants to view it. As of March 2019, the video has received about 450,000 views.

the sense of engineering technicalities and protocols, but rather in a sociotechnical sense pertaining to the impacts of IoT and in a communicative sense pertaining to the processes required to construct a shared vision of a future imaginary. Just as it presents a future-facing glimpse of the imaginary of IoT, the combined video and web-based texts also allow a glimpse at the ways in which media can be used to enroll individuals into a given imaginary. The textual ecology of Intel's IoT video provides us with evidence—when carefully read—for how individuals might be made aware of and adopt certain aspects of another party or individual's social imaginary: the textual ecology provided by Intel exists as a persuasive invitation for a reader to begin legitimizing their technological objects and actions with the imaginary of IoT that Intel holds.

Following the initial presentation of its titular question in scrolling text, punctuated with an animated yellow question mark flourish, the video and its narrator provide an optimistic, stylized overview of various ways in which the Internet of Things will impact daily life in a city. The overview, however, occurs somewhat beyond the daily life of a city's inhabitants: it presents a day-in-the-life of the city itself, its infrastructures and consumer-cultural framework. The tone of the narrator is enthusiastic, the music that supports it is reminiscent of the BritPop movement of the early 1990s, and the graphical content is highly manicured. The combined result of these communicative layers is somewhere between the introductory sequence of The Jetsons, ripe with projected futures past, and the highly mediated world of contemporary experience, topically segregated by windows, frames, and ultimately intermingled through invisible connectivity. It is a marvelous piece of advertising and device of enrollment, but it does not begin precisely with the video itself. Instead, there are a few texts that precede it.

The texts comprising this ecology, including emails and linked web content, perform a subtle regulatory function: through their communicative functions and prescribed forms of interaction both required and optional, they construct a certain type of reader/viewer, a tentatively enrolled subject glancing through a multimedia window upon the precipice of an imaginary future. Readerly and viewerly engagement with the corpus of texts surrounding "IoT Intel - What Does the Internet of Things Mean?" primes the subject, readying them to consider the ramifications and characteristics of such a technological imaginary and an imaginary future—the imaginary of the Internet of Things. Moreover, it primes them to approach IoT with enthusiasm and optimism. This priming effect is described below through a process of close reading and explication.

In priming the reader/viewer to relate to a particular imaginary of IoT, the video and related textual material act as a site of transmission: a passage point between the already-enrolled and the would-be-enrolled. The goal of the following three sections is to provide a richly descriptive overview of the video and its related texts in order to demonstrate the means by which the construction of an appropriate reader/viewer occurs. I will begin with an analysis of the email, followed by an analysis of the landing page to which the email links, and conclude with an overview and analysis of the video itself.

5.2.2 The Introductory Email

Upon opening the email—*click*/*tap*, already within the rectangular world of screens and windows and apps—the reader is presented with a banner graphic in Intel's standard blue. The text contained within that banner reads "The Internet of Things Starts with Intel Inside(R) / What does the Internet of Things actually Mean." Scrolling down for a cursory overview, the bottom of the page is similarly bannered in Intel blue, giving the effect of a closed frame when combined with

the limited vertical mobility of the email—only a vertical scroll is allowed, as opposed to the side scrolling designs of many contemporary websites. (Even the email becomes an image in this way, framed and static, ending with at the boundaries of Intel Blue.) The device, the chassis that holds the screen, comprises the frame in its entirety, but within that frame the blue banners signal a beginning and an end—the top and bottom of a scroll with uncertain material boundaries.

Just below the banner at the top of the email, the reader finds an image of an ostensibly Indian man in his twenties or early thirties, with thick black hair, glasses, and a grey sport coat. (See Figure 1.) His softly golden shirt, visible between the lapels of his jacket, meshes well with the splashes of yellow button-links embedded in the email. His image is, of course, part of the communicative object of the email, but the primary communication, the written text, itself seems to blend with him, to emanate from him. As in the perspective-bending qualities of a diagram, the temporalities of the email's written words and the still shot of the Indian man blend and bend laterally to form a realm wherein the photograph's subject might speak.

Figure 1. Image in Intel Email.

The man stands at a table-like desk in front of a chalky blackboard (well used, but poorly erased), removing a laptop from a leather satchel. He appears approachable in a highly cultivated way, imbued with the youthful, yet paternalistic ease of the stereotypical 'cool' professor—

perhaps a vestigial tail of the largely and regrettably phallocentric culture that pervades much of the tech industry. One gets the sense that he is lecturing in the tech-heavy campuses or labs of Pasadena, Pittsburgh, Troy, NY, or outside of Boston. As he remains suspended in the act of unsheathing his silver machine, he appears to be preparing a lecture. We'll call this fellow Professor Y; the lecture, 'Introduction to Intel's IoT 101.'

Despite Professor Y's congenial affectations, the pairing of chalk and silver betrays the seriousness of the lecture's content: somewhere between the formality of a chalkboard world, with its indoctrination, professionalization, and historicity, and the informality of 'web videos-as-lecture-content.'

Naturally, as per the nearly ubiquitous reach of email interactivity, the reader scrolls down—*swipe*/*click* again, finger upon apparatus—directed by an arrow to the bottom left of the would-be lecturer. There the reader finds the email's textual body:

"John,

You've heard about the Internet of Things, but what's all the fuss about?

Watch this video for an overview of the Internet of Things (IoT), and see what's possible when it's used intelligently."

Just as from a handshake, a nod, or the diction of one's 'hello' exchanged in a face-to-face meeting, the intent and character of the ensuing interaction can be gleaned from this written opening. The reader can scent its ultimate intent. After only twelve words, not including the opening direct address, the reader has already commenced upon a journey into a particular imaginary of the IoT. Already the text of this email performs a limiting and constructing function.

It begins to construct its reader/viewer, to prime him or her for its linked video in a fashion suitable for enrollment into the world of Intel's IoT, one that, as we will see, is characterized by unusual optimism. It does so firstly through word choice and grammar.

Consider the syntax of this sentence: "You've heard about the Internet of Things, but what's all the fuss about?" Rather than relying on more formal language like that of a textbook—perhaps the sort of textbook that would usually accompany a lecture in front of a sprawling chalkboard of half-erased symbols—the line is populated by two contractions: "You've" and "what's," as well as the vernacular terms, 'fuss' and 'heard.' The combined effect of these syntactical choices is a conversational tone. This sentence could just as easily have been written as follows: "You are aware of the term 'Internet of Things,' but why is it significant, and why should you know more about it?" Similarly, it could read, 'The linked video will provide a foundational description of the Internet of Things,' thus avoiding any direct address or pronouns. The messages of those phrasings, however, would simply not be the same. Both alternative phrasings tend toward the dry, the formal. We see in comparing the actual phrasing with other possible phrasings that the content of the video is to be relaxed, accessible, and possibly even 'fun.' But this language does not stand alone. It must be read, interpreted alongside its graphical, pictorial counterpart.

With this choice of language, it is as though Professor Y, visually suspended in the moments before a lecture as if by the lag of a buffering livestream, aims to present a world of technology and connectivity in a casual way. The lecture sits between the formality of chalk-hewn mathematical equations or symbolic logic and the business-casual feeling of an MBA Tuesday night cocktail mixer—a sprawling chalkboard with a deceptively dull edge.

The effect, however, is subtler than it initially seems: through the employment of casual syntax, Professor Y, a stand in for the anonymous corporate authors of the email, betrays the underlying

formality of the subject. (One almost hears the faint sound of bodies in chairs and pens on paper noting that there *will*, indeed, be a final exam, and something akin to Alec Baldwin's delivery of, 'ABC: always be closing' in the film version of Glengarry Glen Ross.) The reader/viewer has arrived at this static classroom, living between technological epochs, between slate and silicone, to learn about something of mathematical or scientific import. The juxtaposition of informality and formality entices the reader to remain and read on.

Via the email's text, Professor Y continues, perhaps with chalk dust upon the elbows of his slim-fit jacket: 'Watch this video for an overview of the Internet of Things (IoT), and see what's possible when it's used intelligently.' With the use of the term, 'intelligently,' he—or the anonymous authors who are embodied through his image—doubles down on the pull of IoT as a topic after having already generously acknowledged the reader's membership in an 'in-group,' of those 'in the know' (i.e., 'By now, *you've*…'). The promise is as follows: not only will Professor Y provide the reader/viewer with an overview of IoT, but as reader/viewer they will be introduced to a rarified world of intelligent possibilities to which Professor Y has generous access, his laptop a technological crystal ball rendered all the more prescient when juxtaposed with the dusty chalkboard behind him. *La vie en rose*; a better, more intelligent future in blue. The reader—finger at the apparatus, closing the gap before another *click/tap*—is poised to receive the text, the Word, a glimpse into a future characterized by informed decisions, but decisions presumably based on greater or deeper, more nuanced information yielding ever higher levels of intelligence. (NB: The reader proceeds with a blurry understanding of intelligence: is this the intelligence of traditional Artificial Intelligence? The intelligence of embodied cognition? etc.) They are part of an exclusive crowd to which further interaction with the email with grant them still further access.

True to the basic tenets of reader response, the exact meaning of the adverb, ‘intelligently,’ remains unknown—all the more so because of the use of the passive voice: “… when it’s used intelligently.” (Who is using it intelligently? Is there a specific ‘who’?) This meaning is left for the reader to determine—in-text resonances with previous, extra-textual usages of ‘intelligently.’ Rather than presenting as a concrete signifier—or in the vernacular of the scientific method, a signifier with apparent construct validity—‘intelligently’ creates something of a nebulous conceptual space relative to which the reader/viewer places herself. Is this the intelligence of an engineer, fully aware of the pitfalls of design and connectivity? Is this the intelligence of an artist or performer, acutely aware of the bodily and instrumental limitations bounding their performance? Or perhaps this is a previously unknown intelligence descended from governmental and military intelligences, generated via the collection of data via massive networks of objects? If one equates intelligence with knowledge, then myriad possibilities exist (Burke, 2000, 2012). All seem possible; curiosity is piqued. The reader remains ‘intelligently’ adjacent. A closer inspection of this term is germane.

Consulting the Oxford English Dictionary about ‘intelligently’ provides further context and some specification: ‘In an intelligent manner; with intelligence, sagaciously, sensibly.’ Although the inclusion of ‘sagaciously’ and ‘sensibly’ sheds some little light on the question of just what ‘intelligently’ might mean, it also raises additional questions relative to each of the speculative interpretations presented above. ‘Sagaciously’ rings with the mysticism of the sage or the oracle; ‘sensibly’ with boundaries and *de facto* discretion of the body. (But this does little by way of clarification: as Camus put it, “The body’s judgment is as good as the mind’s, and the body shrinks from annihilation” [Camus, 2012, p.8] .)

‘Sensibly’ carries with it connotations of reserve and discretion—'with good sense or sound judgement; judiciously, reasonably; prudently.’ When this definition, the fourth in the OED entry, is juxtaposed with the term’s primary definition, a grand uncertainty envelops the reader: “in a manner perceptible to the senses; so far as can be perceived; by or through the senses.” If, then, ‘sensibly’ carries with it not only echoes of sound judgement, reason, and prudence, these echoes reverberate at least in-part against the body that affords perception via sensation. Something odd is certainly represented by this otherwise innocuous term, ‘intelligently,’ somewhere between a first-person narrative and a third-person omniscient. To gain a clearer focus, I turn to the adverb’s noun form.

The OED offers eight definitions of ‘intelligence,’ several with multiple facets. The first bounds the term as follows: “The faculty of understanding; intellect. Also as a count noun: a mental manifestation of this faculty, a capacity to understand.” There is something cyclical going on here—perhaps mystical in the sense of Flusser’s pre-inscription, circular thought (Flusser, 2011a)—waiting to be grokked, to be plucked from circularity and rearranged into idiosyncratic, pre-archival linear sense. But this is still another tunnel in the rabbit hole of this passive ‘intelligence.’ As a result of the passive voice in which ‘intelligence’ occurs, questions pertaining to the just what ‘understands’ or possesses the mental faculty of understanding remain unanswerable. We must turn to the remainder of the email and its linked content to give context.

Professor Y, via email, continues: ‘The IoT is connecting devices and applications to create smart, insightful, and expansive systems. […]’ The shift from the passive to the active voice bestows IoT with agency. Perhaps this is not the agent of ‘intelligently’ above, but it’s possible that it is: IoT will use itself intelligently. Beyond the passive/active shift, the first terms that catch the reader are ‘smart, insightful’ and ‘expansive.’ (Perhaps the intelligence in question is more like

that of military of political intelligence: information gathered from multiple sources about a given phenomenon.) The use of 'expansive' places IoT in the realm of the spatial—it moves from the past of the chalkboard, through Professor Y, and into the vast and implicit network to which his silver machine belongs.

The use of the term 'expansive' places IoT in a vast realm, perhaps even an imperial realm: that which expands starts from a given state and location and spreads outward from that state to occupy a greater area. (This interpretation would be in line with Bruce Sterling's notion that technology creates a new era through the 'rule of empire' [Sterling et al., 2005] , although he does not specifically use the term 'era'.)

The terminal placement of 'expansive' in the series of three adjectives imbues the term with additional weight—perhaps more than even that communicated through the primary adjective, 'smart.' Yet, each of these terms is apparently anthropomorphic. 'Smart' and 'insightful' traditionally relate to the cognitive abilities of a living agent. More often than not, a human agent. That is, a brain and memory reside behind these terms—as does the conflation of education and intelligence—but their properties are here transferred, ostensibly, to the objects populating the realm of IoT.

And this realm, according to Professor Y, is expanding.

> "Watch the video to see:
> -What the IoT actually *is* and how it works
> -An example of the IoT in action, illustrating how smart devices create intelligent, intuitive traffic systems
> -How Intel can help you get to the market faster and contribute to the revolution
> The Internet of Things opens up the possibilities of a smarter, more connected world. **What will you develop to make the world more intelligent?**"

These lines are fraught with weight and promise, relying on the informal syntax already established (e.g., 'actually'), but moving towards the construction of an increasingly specific

reader/viewer. The italicization of 'is,' combined with the argumentative overtones of 'actually' again promises the reader/viewer's entry into the rarefied domain of IoT concepts; the first mention of 'market' reminds the reader that all of this wonder, the field of individuals possessed of The Knowledge—like the taxi drivers of London, knowing every in and out, every twist and turn—pertains to the engine of commerce. The mention of 'revolution' only piques the fervor of knowledge acquisition. The message crescendos via the use of a bold font and direct address—albeit through a weak pronoun—to include the reader/viewer as an agent of revolution, of the proliferation of smart devices.

From within this fever pitch, the final moments of Professor Y's impassioned, yet casual, introduction to his lecture, the reader proceeds again, but further via a third segment of the email found to the right of the core text: another blue box containing a video icon and the text, 'Video: What does the Internet of Things mean? See what's possible in the Internet of Things with Intel Inside.' A third link to the video is then presented in a yellow box below. *Click/tap*.

5.2.3 The Landing Page

When the reader clicks on any one of the three embedded links to the video in question, s/he is redirected to a landing page. The page is again, like the email, framed in Intel Blue. The Intel logo sits at the top left of the window in a blue banner, and the text 'The Internet of Things starts with Intel Inside / What does the Internet of Things actually mean?' follows below it.

Below this text and banner, the page is divided into three vertical columns. (See Figure 2.) The leftmost column is white and largely blank, save for a blue-ribbon icon and the text "Premium Content" located at its center. The words 'premium content' resound: this is where the cool kids meet to learn about IoT; this is the champagne room, behind the digital velvet rope. Professor Y

and his chalkboard have taken on hues of blue light and the back of the school bus, the last rows of the lecture hall. If the act of signing up for email notifications did not signify membership to a certain community, then certainly access to ‘Premium Content’ does. Professor Y, although no longer visible, has guided the reader/viewer to the precipice of the VIP section. It remains, however, unclear just what is paid as premium.

The page’s middle column is presented in light grey with black text: ‘Video: What does the Internet of Things Mean? Get an overview of the Internet of Things and see what’s possible when the world’s industries connect devices, applications, and systems intelligently.’ Finally, the third, rightmost column, solicits information from the would-be viewer. The reader is prompted to enter their email address (a required field). The remainder of the column is populated with boxes to be checked. The first asks, ‘Would you like to work with an Internet of Things expert from Intel?’ (Premium content appears to come with an IoT-concierge!)

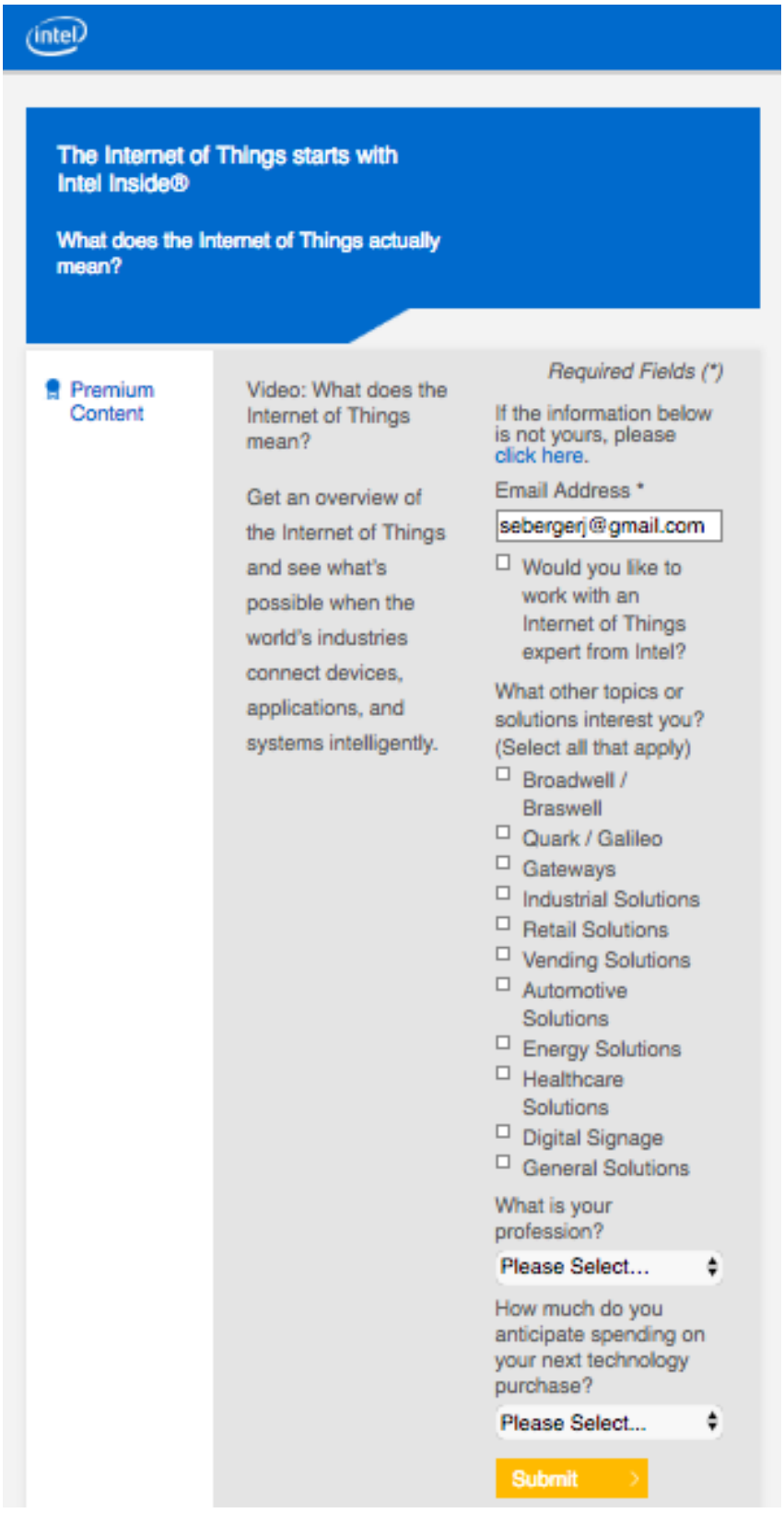

Figure 2. Landing Page (Excerpt).

As can be seen in Figure 2, eleven binary boxes follow the subheading, 'What other topics of solutions interest you? (Select all that apply).' The eleven topics or solutions are as follows: 'Broadwell / Braswell, Quark / Galileo, Gateways, Industrial Solutions, Retail Solutions, Vending Solutions, Automotive Solutions, Energy Solutions, Healthcare Solutions, Digital Signage, General Solutions.' At the very least, the reader is made aware of the extent to which IoT resides in a set of large technological endeavors. 'Premium Content,' it seems, is also a signifier for what some might refer to as 'the Big Leagues.' This landing page, the point at which the reader has almost gained entry to the realm of IoT, belongs to something bigger, something more powerful than the reader alone—it stands not only on behalf of the Intel Corporation, but on behalf of the entire realm of IoT as it exists (in whatever state of realization) in the corporate world. It belongs to a realm where huge questions are asked and answered, societal problems (from energy to healthcare) are (ostensibly) solved.

Finally, two dropdown menus are presented just below the eleven boxes: 'How much do you anticipate spending on your next technology purchase?' and 'How many people are employed at your company?' (It is worth noting that the latter question no longer appears on the current [Dec. 14, 2018] iteration of the landing page. It is replaced by another question: 'What is your profession?') Options for responding to the first question are, 'Over $10,000,000, $5,000,000 to $10,000,000, $1,000,000 to $5,000,000, Less than $1,000,000, Don't know.' Possible responses to the second question are, '5,000+ Employees, 1000-5000 Employees, 100-1000 Employees, <100 Employees.'

The categories presented in the dropdown menus are as overtly constructive as any. As was seen through the analysis of topics presented in Chapter Four, it is reasonable to expect that readers (i.e., individuals who encounter the landing page) function as individuals across two levels: first,

in a traditional sense, as a subject interacting with an object; second, and closer to the grey area produced by US legislation regarding corporate personhood, the individual is assumed to act on behalf of a corporate (or similar) entity—one that is not only defined by vast amounts of money ready to be disposed in the development of an IoT project, but also defined by the number of employees that comprise it beyond the edges of its documents of incorporation.

But the construction of the reader goes further than this: as demonstrated by the responses available to the first question, the reader is assumed to be at least a mid-level executive with substantial spending power, or belonging to a corporate department with substantial spending power. As such, I argue that the reader—the potential IoT user—is first and foremost reconfigured as a corporate actor, rather than an individual. There is, however, still room in this heady taxonomy of spending power for the newbie, the individual, the explorer: 'Don't know.' However, when contextualized by the options that precede it, 'Don't know,' even in the absence of eye-grabbing Arabic numerals, throws the reader into the category of one with spending power—to go from a category of 'Less than $1,000,000' to 'Don't Know' is quite a jump. It is only logical to infer that 'Don't know' is a category appended by a few zeros, at least.

The second question further solidifies the role of the reader in terms of the business world: they are not, as readers, functioning as solely individual agents, but rather on behalf of a large group of people. Whether or not the reader acts on behalf of a humble startup ('<100 employees') or on behalf of an established industrial behemoth ('5,000+ employees'), they are *of* that group.

Providing answers to these questions of spending power, solution-area interests, and the size of one's company also answers the question of just what kind of a premium is paid for access to 'Premium Content.' The premium occurs at first in the form of data, and later in the form of the monies one's department is willing to spend on their 'next technology purchase.'

All this is to argue that the human reader created by the categories provided on the landing page sheds some small light on the nature of the human—the human as discourse, and as discourse network—in the imaginary of IoT. Rather than functioning as an individual unit, the human in this construction of IoT functions as a member within a network: they are part of a corporation, enrolled into contracts and agreements that bequeath spending power and budgets to those who enter into them.

Moreover, the thing that is formed between the reader and the object-text is one that potentially precludes the reader from further engaging with IoT. Similar to the second-person narrator in Geissler's (2018) 'Seasonal Associate,' who, when confronted with the tattered Iron Maiden baseball cap (see introduction to Part II above) is precluded from engaging with that object, the forced choice dropdown menus by which the reader can respond to the questions posed on the landing page potentially precludes the reader from engaging with IoT. The thing that is created through the act of reading the landing page is a gatekeeper thing: it defines the relationship between the reader-as-subject and the imaginary-of-IoT-as-object. A closer reading of this implication indicates that those readers not adequately represented by the items in the dropdown menu are not suitable for inclusion in the category of subject actants within IoT, but are rather relegated to the realm of something else: objects within the (future-ubiquitous) network of IoT.

Any way the text of the landing page is read, the human in IoT is not alone, is incapable of being alone: the human in IoT is an actor in a larger network predicated on the connectivity of institutions and the promise of that connectivity's spread into the realm of new technologies. But within this network, they are either subjects or objects, and sometimes both. This sense of the human is supported by a close analysis of the video to which the landing page directs the reader-turned-viewer.

5.2.4 The Video

The video to which the landing page links can be divided into three segments, each of which is defined by the language that the narrator uses to address the viewer and to describe the video's contents. In order to provide the requisite foundation for the detailed description that will follow, these segments will be described presently.

The first segment is defined by the narrator's use of a direct address: 'By now, you may have heard of the Internet of Things. Sounds interesting. But what does the Internet of Things actually mean?' This first segment lasts roughly ten seconds. Its most prominent features are the largely dichromatic color scheme of blue and white, the presence of upbeat music, and the narrator's voice presenting not only semantic content, but also emotional content by way of pitch and inflection.

The second segment, which comprises the bulk of the 00:03:16 video (roughly two minutes and 20 seconds), is devoted to explication of IoT. That is, it bears primary significance to the term, 'actually:' it unpacks, in a rudimentary way, the facade of the blackbox lurking behind the buzz words, but does not dig into or unpack the actual contents of the blackbox itself. One gets an impression of IoT, a sense of the possibilities of IoT without an understanding of the code, the actuators and sensors, that will go into realizing even a subset of these possibilities. It has as its primary characteristics the presence of visual sets, more frequent breaks from the dichromatic color scheme, a shift in musical tonality, and a narrativized use case of how IoT might play out in the world.

The third segment, beginning at 00:02:27 and lasting for the duration of the video, is characterized by the unification of the viewer and the narrator. Such unification is signified by the use of the term, 'we.' The introduction and use of the term 'we' signals an assumed enrollment: by the end of the video, the viewer is assumed to be onboard, a part of the IoT in-crowd.

As I will demonstrate, the structure of this video, along with its content, is intended to enroll the viewer into imaginary of IoT. This is the point of the video as much as providing an overview of what IoT might mean: it is a mechanism of enrollment. In doing so, it creates a sort of moving diagram of IoT possibilities. That is, in broadly and loosely defining IoT through visual and linguistic content—but doing so only in a positive sense rather than through the presentation of negative definitions—the video creates a realm of future possibilities and leaves wide open the possibility for the further expansion of this IoT imaginary into other nondescript realms of human life. In constructing the reader/viewer, the video also subtly constructs just what these nondescript realms of human life are. The goal of this analysis is to begin to identify, through a process of close reading, just what these realms might be: the characteristics of cultural-historically embedded human life in the imaginary of IoT. Each segment will now be described.

5.2.5 The First Video Segment

The first segment of the video opens with a blue screen, music, white text rolling from the left to the right and a narrator. The Intel logo is present at the bottom right of the frame. (It remains there for the duration.) The music, a processed acoustic guitar playing a barred G Major chord and accompanied by rudimentary percussion and an upper-octave piano triad in common time at a walking pace (roughly 120 beats per minute), is mixed just below the voice of the narrator. The narrator speaks in a clear, almost Midwestern American accent. As the text, 'Internet of Things,' reaches left-center of the frame, it slows its rightward motion, at which point the outline of a yellow question mark rises from the bottom of the frame to fill the right third of the frame. (See Figure 3.) The presence of this yellow question mark serves as the primary visual focal point. That is, while it resonates with the use of yellow in the clickable graphics contained in the email, it stands

in stark contrast with the otherwise blue and white video content. The answer to this question, begged by its position, stands out. Color, it can be assumed, will play an important role in the visual subtext of the video.

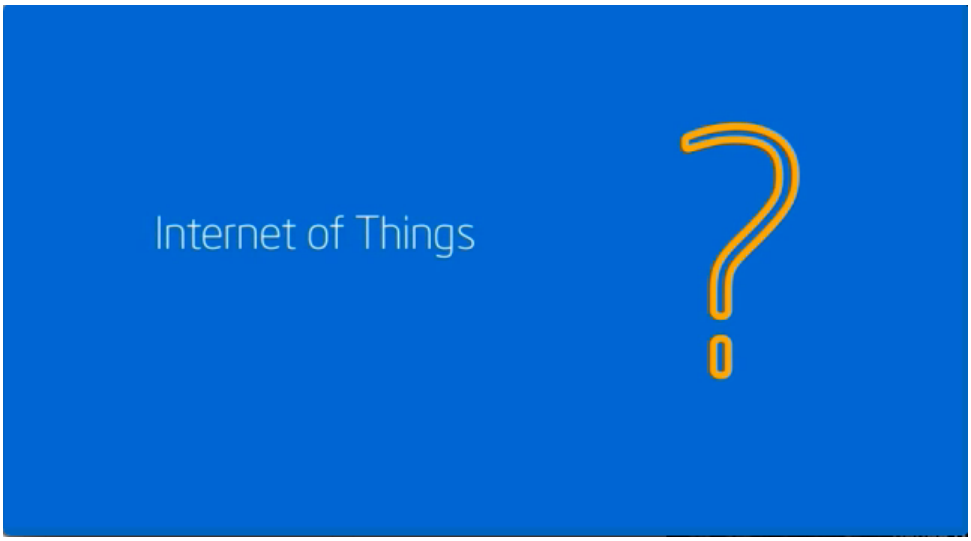

Figure 3. The video's opening color scheme.

As the narrator asks the titular question, 'But what does the Internet of Things actually mean?' the words 'Internet of Things' begin a downward motion, only to cycle clockwise at a rapid rate around a dissolved-in graphic of Earth. (See Figure 4). As is common in the West, the Sargasso Sea is found roughly at the center of the stylized, white-on-blue earthly sphere. The North, Central, and South Americas are almost entirely visible, alongside Western Africa, Western Europe, and parts of Greenland and Antarctica. The viewer infers an international quality: the focus is not on the Americas or Europe alone, but rather on the body of water that both separates and conjoins them. The liminality of the sea, its vast expanses and ever-changing composition, help set the tone for an IoT that itself is both vast and (presently) changing, extant between two worlds—perhaps the Old and a New. Like the sociotechnical contrast found in the space between Professor Y's chalkboard and laptop, IoT's relevance to the world as represented in the video's Earth icon is one

of difference and change, of liminality and the gatekeeping, the triumphant connectivity of overcoming uninhabitable distances and terrains. The electronic skin that the earth will don seems to be one that will patch over or shrink the distance of the great oceans: the skin will connect; it is mesenteric, but mesenteric in a way that is both internal and external—mesenteric and epidermic at once.

Figure 4. "Internet of Things" rotates clockwise around earth graphic.

The text, 'Internet of Things,' having come full circle around the Earth icon, but losing none of its momentum, pushes the yellow question mark out of frame to the right. The graphic of Earth remains central in the frame, but resides fully in the bottom half. Here the Earth sits in its own sea of blue—a sea within a world within a sea that alludes to the presumed scalability and massive contextually of IoT—pacific and serene, amidst an unchanged musical arrangement—wrapping up a twelve-bar statement of the G Major rhythmic motif outlined by the acoustic guitar, piano, and percussion. Thus ends the first and shortest segment of the video: just the viewer, the narrator, the Earth and a brightly colored question framed in blue and white. (See Figure 5.)

Figure 5. Earth graphic framed in blue.

5.2.6 The Second Video Segment

At the beginning of the second segment, the narrator continues: "IoT is an evolution of mobile, home, and embedded applications that are being connected to the Internet, integrating greater compute capabilities, and using data analytics to extract meaningful information." The novelty of this segment is not only indicated by the narrator's attempt at providing a positive definition of IoT, but also by the shift in the video's incidental music. Where during the first segment of the video, the accompaniment sets the tonality of the music—again in G Major—the harmonic content shifts to indicate the presence of new semantic content. The shift, however, is one that is familiar to anyone who listens to Western music: from G Major to C Major. This shift (represented as 'I-IV' in notation) is perhaps the most common harmonic shift in popular music. (For those of us not musically inclined, the root notes of a I-IV progression can be brought to mind by singing or humming 'Here comes the bride.' It is the pitch change between 'here' and 'comes.') As such, it signals a change, but a change that is familiar: it is just enough to provide the appearance of

harmonic motion and to extend to the video a similar sense of motion. So, then, the viewer/listener is gently guided into an answer, but an answer that is grounded in the familiar: the world of IoT will be different, but not so different as to preclude enrollment. It *is* possible, but in being *possible*, it is also *only a possibility*. It is an imaginary.

The graphical choreography accompanying this narration—'IoT is an evolution…'—is highly curated. The graphic of Earth remains in the low center of the frame. As the narrator says the words, 'mobile, home, and embedded,' three graphics appear consecutively: a tablet or pad on the upper left; a home in the upper center; a mechanical arm such that one might envision in a factory or loading dock, having three joints and two pincer-like appendages. (See Figure 6) to the upper right of the earth. The arm is bent at its second joint at a slightly acute angle, with its pincer appendages open towards the right side of the frame. What results is a well-balanced, graphical representation of a taxonomy—an ontology into which the objects *of* the world, but graphically outside of it, might be placed.

With the appearance of these three graphics, it is clear that they are not adequately described as graphics alone: they are icons, the Earth, too. They also exist, like the elements of traditional diagrams (Bender & Marrinan, 2010), outside of expected perspectives or scales: rather than creating a realistic representation of the relationship between the Earth and its object-contents, it creates a conceptual space in which these objects of massively varied sizes are not considered in their actual physicality, but in their possible conceptual relationships to each other. The rhetorical function of this presentation is as follows: the viewer is presented with iconographic representations of objects (the earth included), which despite their difference in scale, are presented at the same scale. This scale-breaking presentation signifies a fundamental ontological

reorganization. The objects are the same, but they are different—related to each other in different ways.

Figure 6. The Earth graphic and tablet, home, and mechanized icons.

The graphical characteristics of the icons also unite them in new ways. Each icon shares certain characteristics that bind them together into an ostensibly unified meta-category. Each is the same shade of white. This white color, comprising the filled-in portion of the icons, is offset and defined by the blue background—there are no black outlines of any kind, only objects and background. Each icon makes sparing use of right or acute angles to define itself to the eye. The tablet or pad icon utilizes right angles only to define the boundaries of the screen it contains. The edges of the icon are rounded, as is the canonical 'home' button located at the bottom of the icon's face. The icon representing a residential dwelling includes four right angles defining the A-frame roof, two right angles at the top of its chimney, and two right angles defining the bottom corner of its door. Its overall appearance, however, is one of rounded edges and fluidity; the harshness of the angles that are present is offset by the transparency of the icon's borders in relation to the placid blue

background. Finally, the mechanical arm presents as the most angular icon, but its angularity—that of the pincers and base—is effectively negated by the concentric joints that connect its three portions. In this we see the dichotomy of the natural and the artificial, but a dichotomy that is not defined in terms of contrast, but in terms of dissolution of the dichotomy.

As the narrator says the words, 'that are being connected to the Internet,' dotted lines appear between each of the icons and the icon of the Earth: three icons connected by dotted lines moving from icon to Earth in static orbit. (The resulting image brings to mind a splayed trident, as if the imperial connectivity represented in the USB trident is being stretched to new territories, or imbued with a broader reach.) The dotted lines that connect the icons to Earth are emphasized by an increase in dot size when the narrator says the words, 'greater compute capabilities.' (See Figures 7 and 7a.)

Figure 7 and 7a. Emphasis on dotted lines representing connectivity

At this point, the four-part constellation of tablet/pad, home, mechanical arm, and Earth, begins to recede as if the camera (a hyper-mediated presupposition in the case of this fully digital video where no camera is present) were zooming out to expand the frame. Concurrently with this zooming out, and as the narrator utters the words, 'to extract meaningful information,' three separate circular icons appear in smaller constellations around each of the three extraterrestrial icons. (See Figure 8.) These nine circular icons contain representations of data visualizations: pie charts, distributions, bar graphs. They also constitute the first appearance of color outside of the dichromatic blue and white scheme that has heretofore defined segment two. The various pie slices and bar graphs appear in red, yellow, and deep grey. But, as with the splash of yellow in the video's first segment, their visibility is short-lived.

Figure 8. Colored data ripe for extraction.

As the narrator says the words, 'to extract meaningful information,' the circular icons bearing information visualizations are fed downward along the dotted lines toward the Earth icon. They

appear to disappear, moving from an unspecific externality into the internality of the world, crossing the blue space that defines the icons' separation from Earth. A barrier of space—the placid blue punctuated gently, impermanently by the dotted lines—is traversed, and the data-turned-information represented by the boldly colored infographs is fed back into the world as 'meaningful.' (See Figure 9.)

Figure 9. Infograph icons are fed into the earth icon.

Here, again, an issue of agency arises, but it does so by way of the term 'extracted,' rather than as a result of the narrator's passive voice as in the example above. Extraction most certainly refers to the removal of something—ore from the ground, meaning from text (as in the present case), soldiers from combat. That which is extracted is conceptually separated so as to be extractable, then removed from one state or system and put into another. (Extraction is not oblivion! But rather a remediation, media being moved from one media into another as per McLuhan.) But the visual information presented in the video brings into question the placeness of the internality into which extracted information is put. All that is extracted is extracted from one location or state into another, transformed via extraction from its unified belonging to one state into its assimilated

function in another—the traversing of data-turned-information from devices to the iconic Earth assumes that the information extracted was always already there, waiting like a mineral from some applied and artificial functionality, and that through its extraction is it identified and rendered somehow useful. In such extraction the medium that is the message changes. The data (i.e., content) that allows for the identification of a medium (e.g., a tablet), which is always already the message, is ported to another as yet undefined medium, which will inevitably become its own message—which will inevitably give rise to a novel discourse network that resides somewhere in, and bounds the placeless of, the imaginary of IoT.

A nebulous conceptual separation of device and world is apparent in the constellation of icons. Although the devices must necessarily be *in* the world, it is as though they are not *of* the world, such that the referent of the Earth icon can function as the recipient of the information extracted from the devices. This is an earth of the future, an earth that is imagined in terms of the unrealized discourse network(s) to which IoT will give rise. It is as if the Earth is augmented or transformed in some way through the identification and extraction of data, of information, from the Earth and back into it. At the very least, the separation by way of the extraction process that characterizes the relationship between the three device-icons and the Earth-icon hints at some sort of larger system possessing specialized parts. Perhaps this system is not unlike a body, wherein the digestive tract is responsible for the extraction of nutrients, which are then delivered into the greater body writ large, building up (albeit it in a highly reductive and stylized way in this case) to the maintenance of a consciousness, an intelligence or sagaciousness. Perhaps this problem of extraction will become clearer as the video progresses.

Following the visual extraction of the nine circular icons, the camera simultaneously zooms out and shifts position to place the Earth icon in the center of the frame. As the narrator says,

‘Billions of devices will be connected to the internet,’ roughly forty new icons appear in a constellation around the Earth. (See Figure 10.) They do not appear all at once, but rather pop up like bubbles in a three-volume German language nightmare. The words ‘Billions of devices’ appear below the Earth as the icons fully populate the frame. Each of the icons is connected—like roads to Rome and rivers to the sea—via dotted lines that form paths ultimately leading to the Earth icon. The graph that is constructed appears haphazard. (It is tempting to suppose a rhizomatic structure to the graph, but the centrality of the Earth icon apparently precludes such a structure.)

Figure 10. Billions of (heterogeneous) devices.

Each of the icons are graphically homogeneous with the initial three icons representing pads/tablets, the home, and embedded applications. That is, each icon is comprised solely of white and blue colors with generally rounded edges. However, the graphical homogeneity of the devices appears in contrast to the ontological heterogeneity of them. Among these forty some icons, the viewer finds: a headset, a delivery truck, a wireless router, a person ostensibly wearing a hard hat, an ungrounded electric plug, a concrete mixing truck, a video game controller, a tractor, a lightbulb, a wind turbine, a stoplight, a hypodermic needle, a microscope, a hospital sign, a

doctor's clipboard, and an airport parking sign. The artifactual richness of these objects—the extent to which each one of them alludes to not only different forms of subject-object interaction, but also the complex web of infrastructures that give rise to them—is all but occluded by the homogeneity of their representations. Through their dichromatic representation in blue and white, and accompanied by the textual information, 'Billions of devices,' each of these objects is depicted as belonging to a single category: 'device.' The rich ontology of these objects as they exist in the heretofore standard taxonomy of the objects that populate our early twentieth century western milieu take on, now, a flattened appearance. Like overly kneaded dough, they are folded and manipulated into a flatness, a plane. Taken in the context of the narrator's previous use of the term 'extraction,' the viewer might safely assume that this flattened ontological category—the device—is unified by the devices' extractive functionality. 'Device' exists as a signifier for a unified functionality of the objects it describes: they extract. The subtle and not-so-subtle differences between objects that render them members of (extant and previous) ontological categories are backgrounded, overtaken by the foregrounded extractive function that they carry out in the world of IoT.

As the narrator says the words, 'And soon, hundreds of billions of devices,' the camera zooms out even further to reveal roughly one hundred icons, constellated around the Earth icon now fully centered in the frame. (See Figure 11.) The newly introduced icons are partly duplicative of those already presented, but do, indeed, include new elements: a road surrounded by hills, a cash register, a suitcase on rollers, a box of goods that resembles a toaster (but does it make julienne fries!?), a satellite, a television, a water main gasket, a refrigerator, a photographer's camera, a CCTV camera, a laundry basket, a nuclear reactor cooling tower, a smart watch (the terminology of which is problematic, given the issues of construct validity raised earlier), a highway interstate sign, a

bus, a ship, a car's speedometer, an air traffic control tower, and what appears to be a gear with the percent sign at its center. The immediate effect of this visual cacophony is almost overwhelming. The subtler semantic content is equally overwhelming: through their inclusion in the imaginary of IoT, each of these objects and extant categories they represent, are enrolled into the role of 'device,' the role of the extractor.

Figure 11. "Hundreds of Billions of Devices"

The narrator continues: "As related devices connect with each other, they can become an intelligent system of systems." At this point, the majority of the icons fade into the background, consumed by blue, as thin white circles are drawn around smaller groups of related icons. (See Figure 12.) These encircled groups are then connected by dotted lines. Thirteen groups—sets—are created by thirteen circles, with two of the circles containing multiple subsets represented by circles within circles. As the sets coalesce, the camera continues to zoom out. Dotted lines, like those that connected the original three icons with the Earth icon, begin to populate the screen connecting each of the encircled sets. They do not, however, connect any of the sets with the Earth

icon; instead, they connect with each other, set to set, as the Earth icon continues to become smaller as a result of the zooming out effect.

Figure 12. Self-organizing sets of devices.

The effect is graphically simple, but ontologically complex. To illustrate, I'll describe a few of the sets that are created. To the upper right of the relatively small Earth icon appears a set comprised of a US Interstate sign, a CCTV camera, a stoplight, a construction barricade, a tow truck and what could either be a speedometer or a fuel gauge. This set would make a poor example on Sesame Street ('Which one of these does not belong?'): each of these objects intuitively belongs together, with the construction barricade being central to the set. The set pertains to transportation and its supporting infrastructure, indicating that the objects responsible for data extraction are intended to extract data relevant to transportation. Given the graphical centrality of the construction barricade, it seems safe to interpret this set of objects as intended to extract data about the breakdown of transportation infrastructure—like points in time at which transportation infrastructure becomes visible to its users. In the complementary conceptual space this set creates, it seems also appropriate to assume that this set is as much about the maintenance of traffic

infrastructure as it is about its potential breakdown. As can be demonstrated by a comparison with two of the other sets, however, 'transportation infrastructure,' or even the 'maintenance of transportation infrastructure' is too broad.

The set just below the Earth icon resides another set of six icons, this time centered around an icon of a jet airplane. Starting just above the plane icon and moving clockwise, one sees a piece of luggage, an airport parking sign, an air traffic control tower, a baggage truck, and what appears to be an icon for a boarding pass. This set, too, then pertains to transportation. Clearly, though, it applies to a different form of transportation and maintenance of transportation infrastructure than the first set: this is a set of air travel, conjuring images—though explicitly absent—of cross-terminal dashes at O'Hare, May Day flowers at DeGaulle, the lost luggage line at LAX, and degrading body scans in Sky Harbor. But even as these bits of experiential knowledge pertaining to air travel emerge from this set of icons—the point at which the readers insert themselves into the diagram, thus girding the notion of the diagram as an open work—a glance to the right of this set reveals their prematurity. That is, it is the desire to see a human, to place the phenomenon of being within and amidst these icons, that conjures memorial traces of lived moments at airports.

To the right of the air travel set can be found still another set of six icons centered this time around a human icon. (Importantly, this set is a subset of a greater set containing two other encircled subsets—one is fully visible, the other is not). (See figure 13.) Around the human icon, again starting above it and moving clockwise, the viewer encounters: a train icon, a cruise ship icon, another baggage truck, another airplane (these two icons are the same as those that appear in the aforementioned set), and a bus icon. Tempting though it is to assume that this set pertains to the mundane experience of humans traveling, closer inspection of the human icon at the constellation's center reveals that the human represented is a worker—the figure has arms

outstretched above their head and appears to be waving objects. The human icon also appears to be wearing some form of head gear, likely a hard hat. So, then, this is not a human traveler, but a human worker performing labor in the realm of transportation. The human appears—graphically similar to the objects that surround them—but appears in terms of their function within a given infrastructural realm.

Figure 13. A human-centric cluster of devices (Detail, bottom right of screen).

Included as another subset of this greater set, just to the right of the 'transportation worker set,' the viewer sees a group of four icons with no central focal point: a GPS screen (e.g., a TomTom from the days before smartphone apps like Waze), an automobile, a fuel pump, and a satellite. This set immediately appears to be referencing a particular discourse of travel: the in-situ positionality of travel and of the traveler. The combination of GPS screen and satellite allude to a sense of knowing where one is while traveling; similarly, the combination of GPS screen and fuel pump alludes to a sense of knowing where to fuel one's car so as to continue traveling. The car speaks for itself as the primary vehicle for travel in the US.

Here, it would seem that the inclusion of a human icon, but one that is not specifically performing a task, would be appropriate: much of life, particularly American life (and especially life in Los Angeles County) occurs inside of a car. We listen to music in cars and we daydream in them. We hear the news or laugh or revolt at the morning talk show. Teenagers gain their freedom in cars, make out, try their first cigarettes and hold back the vomit, smoke weed and drive around. They sit seven to a sedan because only one kid's parent was willing to loan them their car, and they don't mind, thigh to thigh. They lie about fender benders and tremble when they get their first ticket. We 'go for drives,' although less and less it seems, to get lost in corn fields or deserts, to get out of town, to see whatever might appear along the roadside. Children play games—'I spy with my little eye…' and License Plate Bingo—and fight with their siblings on road trips. Dads and Moms threaten to 'turn this car around,' the Griswalds buy a Christmas tree, Bob Seger 'rolled [himself] away,' and the family gives a nickname to the lobster-red minivan they rent on vacation in Maine. But all this is lost, graphically overlooked and forgotten, in this subset of travel-positionality icons. These icons are about the efficiency of travel, rather than the experience of travel: they are about travel as an object for extraction. They are about knowing the GPS location of one's automobile rather than being in the position one is actually in; they are about making sure you don't get lost, don't run out of gas.

But just as soon as these sets of icons settle in to the visual field, they are removed through a rightward panning of the frame. The narrator says, "And when these intelligent devices and systems of systems share data over the cloud and analyze it, they can transform our businesses, our lives, and our world in countless ways;" the camera continues its rightward shift revealing a cloud icon, connected to the previous sets of icons via two dotted lines, and still to another image, a large building that fills a little more a third of the frame.

The building's rooms are transparent and contain four large server towers, several desktop computers, and several laptop computers. (See Figure 14.) As the narrator says that they can transform our businesses, lives, and worlds, the colorful infographics that were fed, extracted *into the* Earth icon earlier, move along the dotted lines and appear on the screens of the computer icons that populate the large building. The introduction of this building, as well as the motion of the brightly colored infographics from terminal to terminal, indicates a shift. It is here in the video that an example—as concrete an example as can be expected when speaking in hypotheticals—is to be introduced.

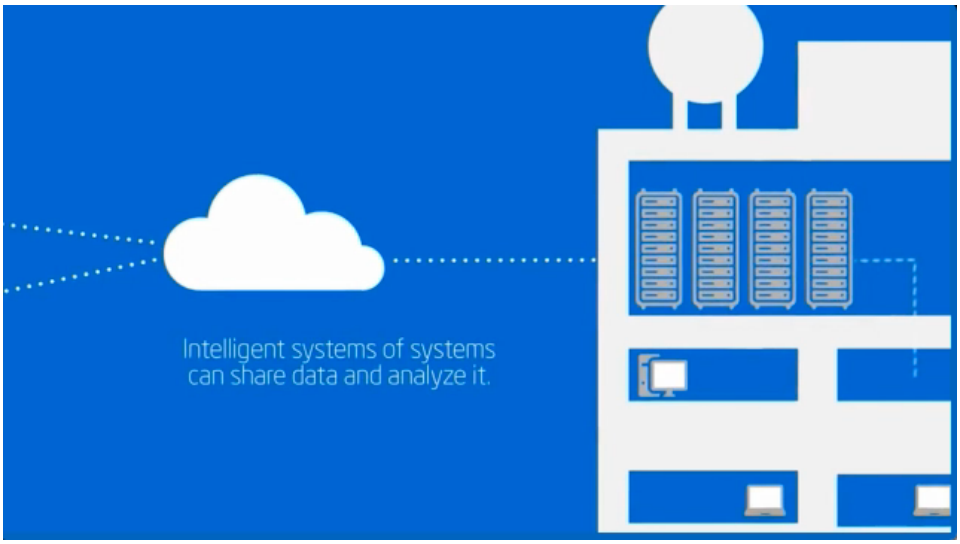

Figure 14. Servers, desktops, laptops in building.

As the narrator takes a breath after the words, 'countless ways,' the camera pans back out to reveal that the grey building chock-full of terminals and servers is situated in a world. In achieving a zooming function by way of a rightward pan, rather than an actual zoom, the video further exhibits characteristics of a diagram in motion. That is, the perspective is entirely artificial: the goal of the video further defines itself as one of creating a conceptual, though not fully extant,

conceptual space. This conceptual space is the realm of possibilities represented by the imaginary of IoT as it is held formally by the Intel Corporation.

The introduction of eleven smaller buildings in the background, presented in a darker grey that is tinted with blue resulting in a hue somewhere between the blue background and the grey terminal building, as well as five green trees that appear to line a road on which the terminal-building sits and a brightly colored sun that appears at the top left corner of the frame, places the viewer in a world—the effect is one of synthesis between the heretofore separated icons of the Earth, the tablet/pad, the home, and the mechanical arm. Again, the world in which the viewer is place is not one of physicality. Instead, it is a world of conceptual relationships, of potential networks and information highways or side streets. It is a world within an imaginary, where such an imaginary—the logic that allows for a sense of purpose and direction—is predicated on the concept of extraction. The viewer has entered a hypothetical world, digitally animated, where all of these icons and their connotations exists simultaneously in one system. It is at this point, I argue, that an identifiable imaginary of IoT is first presented: the world that greets the viewer first as a banal cityscape is the imagined world of an IoT-saturated future.

5.2.7 Three Brief Scenarios, or, Plays Within a Play

The narrator continues: “whether it’s improving medical outcomes, creating better products faster with lower production costs, making shopping more enjoyable, or optimizing energy generation and consumption.” Each of these realms, these domains of life that exist within the burgeoning imaginary of IoT, is accompanied by a set of animated graphics. The camera pans continuously to the right as the narrator mentions each of these scenarios. Moving along the road on which the terminal building and the trees and the background cityscape sits, the frame comes

to include a green tree, a red car, and a hospital building represented in the same color scheme that dominated the first portion of the video: blue and white. (See Figure 15.)

Figure 15. Green tree, red car, white building and people.

As the narrator says, 'improving medical outcomes,' the camera zooms in, enlarging the buildings that formed the background cityscape (now positioned in the lower left quadrant of the frame), and focuses on a female figure pushing another, gender-nondescript figure in a wheelchair towards a red car. She pushes the wheel chair in three jerky sets of steps towards the car. (One is left to wonder whether or not her FitBit will count those movements as steps due to their lack of fluidity…) Directly above the female and her wheel-chaired companion, the viewer sees the telltale "H" sign that denotes a hospital. The hospital building, truncated as a result of the camera's zoom, appears with four rows of three windows above an entryway.

Through the hospital's windows, the viewer is able to see a few different scenes. The bottom right window allows a view of a doctor wearing what appears to be a stethoscope receiving a white piece of paper (perhaps it is a tablet?) that has a red heart icon on it. In the row of windows above, although this time in the leftmost window, the viewer can see a nurse performing some kind of

physical check-up on a child or infant. Both appear as stark white icon-like figures, opaque like the canonical signs that appear on public restrooms. In the row above, again to the far right, there is the image of another nurse—nearly the inverse of the nurse in the second row—who is reaching just out of view, ostensibly to perform another medical task. Given the absence of a patient from this scene, it is possible that this nurse figure is intended to represent the performance of documental maintenance. (The imaginary of IoT is not without bureaucratic functions.) The fourth row of windows contains the image of someone sitting on an examination table, although only the bottom half of the scene is visible. Despite only partial visibility, it is clear that only the patient is in the room.

These four small scenes, vignettes framed by diagrammatic windows, each allude to different categories of functionality within a hospital: adult medicine and pediatrics (which could be summarized as representing the relationship between a doctor and patient), file maintenance or bureaucratic work, and the one-sided experience of waiting for a medical professional. In this way, 'improving medical outcomes' gains reach over many of the scenarios that initially come to mind when one considers the workings of a hospital.

Before moving on to a description of the second mini-scenario, the use of color in this scenario is worth describing in some more detail. Given that the video is largely dominated by tones of blue and white, the splashes of color stand out in such a way as to serve as primary focal points. They function as a signal to the noise of the standard dichromatic color scheme. In the hospital frame, the red car, green tree, and the red heart that adorns the doctor's paperwork in the first row of windows are what attract the eye. From this, and in addition to the fact that only 'medical outcomes' in the broadest sense are referenced in the scenes that peer out from the hospital's windows, it might be read that 'improving medical outcomes' is as much about improving the

convenience of traveling to and from the hospital as it is about improving the data to which doctors have access. In improving access to and from the hospital, the extent to which the medical field extends into the world outside the hospital is also brought into focus. That which stands to be improved by IoT—by way of extraction—is general. The presence of the green tree in this scenario also indicates that 'improving medical outcomes' might have something to do more generally with improving the relationship between the practice of medicine and the world that resides outside of the medical domain, bridging the artificial treatment of the natural with the more broadly natural world. The generality of the notion of 'improving medical outcomes' leaves plenty of room for imagination, but provides little in the way of specificity—only an outline, an ontological armature for the experience of medical outcomes.

After a short pause, the narrator moves on to the topic of 'creating better products faster with lower production costs.' As he says these words, the camera pans still further to the right. The continuity that existed between the Terminal Building and the hospital, each being connected by the same road and part of the same cityscape, is broken. The faint outline of a factory of some kind appears in the background, occupying much of center and left portions of the frame. It is, however, unclear what kind of factory this might be—perhaps so unclear that 'factory' might not be the right term. The industrial structure, represented in another hue of bluish grey, is reminiscent of the steelworks in Gary, Indiana, or the silhouette of industry that looms around the Port of Long Beach from a distance. In the foreground, the viewer sees an assembly line churning out white boxes from a grey, opaque rectangle. (See figure 16.) The yellow mechanical arm that was first presented in relation to the Earth icon at the beginning of the video now, in a somewhat larger form, presides over this assembly line. It reaches backwards to the left side of the frame as a green forklift appears at the end of the line as the white boxes on the line stop their motion.

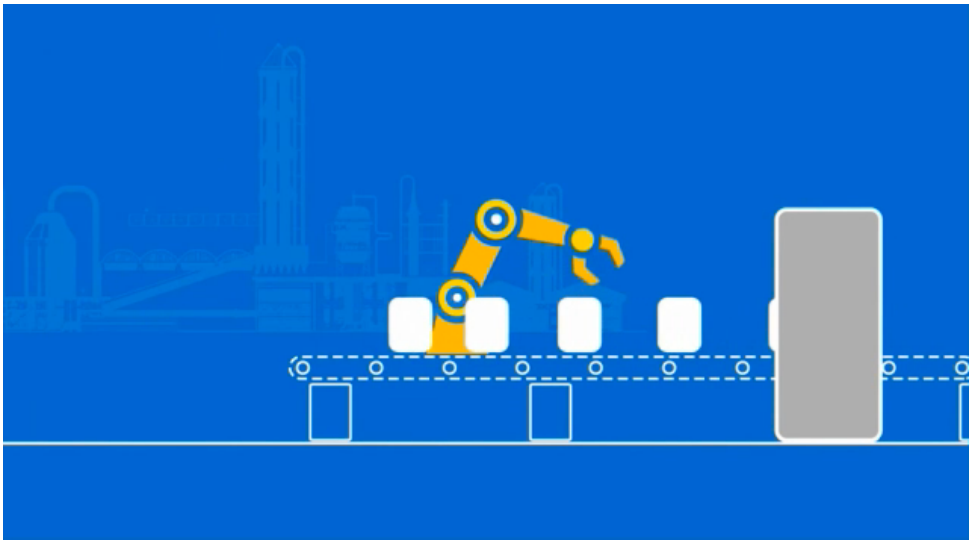

Figure 16. Factory setting.

The same generality that pervaded the hospital scene is present in this industrial scene. It is perhaps funny that the white boxes on the assembly line emerge from a grey box, as each of them function as placeholder blackboxes for the production of goods. But there is little time to dwell on this—this industrial scenario constitutes only a few seconds of the video. Almost as soon s the viewer is aware of the details of the shot, the camera continues its rightward pan. It is as though the authors of the video are sweeping the massive industrial function of IoT under the rug, choosing instead to focus on scenarios that speak to human-interest.

As the camera pans right, the assembly line appears to back directly up to a multi-tiered shopping mall. This is the mall wherein IoT will making 'shopping more enjoyable,' as the narrator said. This is also the richest of the three mini-scenarios: there is a lot going on in the frame. (See figure 17.)

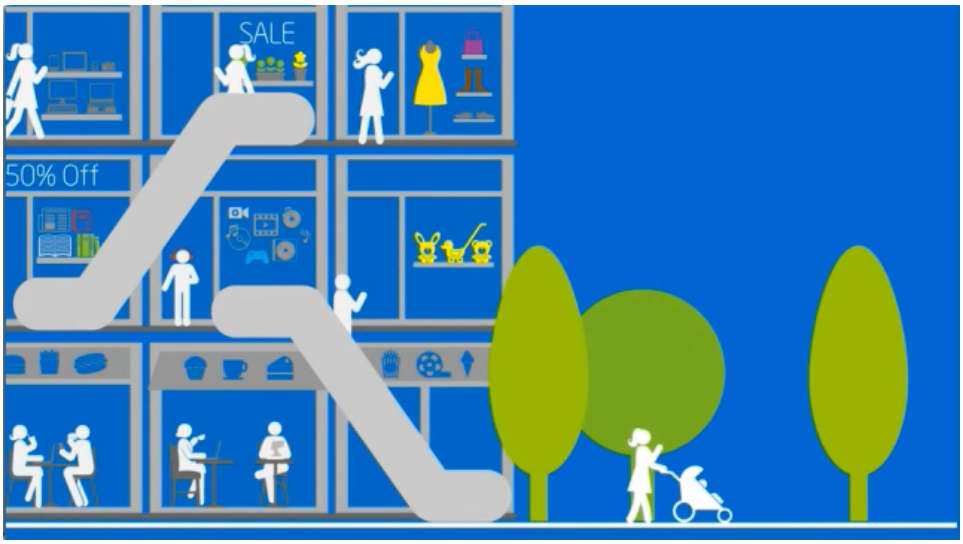

Figure 17. An IoT-enabled shopping mall.

The mall appears to be an indoor-outdoor shopping center, much like the ones you might find in Southern California, on Walnut Street in Pittsburgh, or on the North Shore of Chicago. On the right half of the frame, the viewer sees three large, green trees. They are well groomed and oval or circular, orderly. Just beneath the trees, there is another woman pushing something—this time it is a stroller with a child in it. She has one hand on the pram, and one hand held up between the stroller and her face. A common enough stance, it appears as though she is consulting a smart phone. The left half of the frame, behind the lady with the stroller, is filled top to bottom with a building containing nine square places of business across three floors. The floors are connected by large escalators, which are populated by two figures: a man on the lower escalator, a woman on the upper.

The top floor of the shopping mall, from left to right, has a store window with computers in it. A woman with a shopping bag walks in front of it, past it—the computers are presented in the same dull blue-grey tone in which the cityscape and industrial backgrounds were presented earlier. The next shop, at the center of the top floor, appears to have flowers in the window. A relatively large, bright blue neon sign reads “SALE” just behind the lady descending the top escalator. Two

sets of flowers are depicted in a bright green color, and one is yellow. The rightmost store is an apparel store: a woman stands in front of it ostensibly admiring a yellow dress, pink bag, brown boots, and grey shoes.

The second floor of the shopping mall contains, from left to right, a bookstore, a digital media store, and a toy store. A male figure stands in front of the window of the media store. It is likely he is a child, given his comparatively smaller stature than other figures. He is wearing red headphones. A gaming controller (reminiscent of early PlayStation controllers) appears in bright blue, a camera icon, such that one might see in the camera mode of their smart phone, appears in in white. A record appears with two eighth-notes above it, next to a video playback icon, and two compact discs. (One is likely a DVD, as the other is also accompanied by musical notation.) A musical staff appears to float in the ether. Each of these items appears in the same dark grey as the computers in the window diagonally above. The items in the bookstore to the left are mostly brightly colored: a green set of spines, a red book cover, a bright white folio. The newspaper, however, appears in a dull grey. The bookshop is also adorned with another splash of color: a neon sign that reads “50% Off” sits atop the window. Finally, the toys in the window of the toy store are all bright yellow, but a slightly less saturated yellow than the dress in the window above: a yellow teddy bear, a yellow duck pushcart, and a yellow stuffed rabbit.

The ordering of the content on this second floor deserves some closer attention before descending to the ground floor. From right to left, one might read a progression: from children’s toys, to digital media (once the toys of teenagers, and now the toys of post-Millennial generations writ large), to print media. It is perhaps telling that the print media, directly juxtaposed with the digital media to its right, is being sold at 50% off. Although the coloration of the print media indicate that they are, indeed, a focal point for the viewer, the reduced price alludes to a reduced

value. This is perhaps most apparently the case for the newspaper, which unlike the other items in the window, appears in a dull grey. It is clear that media plays a large role in the 'enjoyable shopping' that might occur in the imaginary of IoT, but this particular scenario leaves ample room to read a hierarchy of value into this media ecology.

Finally, the ground floor of the shopping center consists of dining establishments. A man and woman sit across a table in the leftmost window, which is adorned with icons of a hotdog, fries, and a hamburger. (Evidently even fast food, the most 'convenient' of dining options, can be made more enjoyable!) In the center window, adorned with a piece of pie, a muffin, and a coffee cup (harkening back to the now-quaint American notion of 'pie and coffee,' surviving largely in the work of David Lynch—'Damn fine coffee!'), the viewer sees a woman sitting alone at a table with her laptop and a man sitting on a tool facing the window with a cup of coffee. The rightmost store is empty, but its purpose is defined by the icons above its window: an ice-cream cone and a bag of popcorn. (A third icon is present, but it's meaning is unclear to me—it appears to be a soccer ball with a tail.) (Refer again to Figure 17.)

As has been the case throughout the video, the coloration of the items that break with the dichromatic blue and white theme, leap from the video as primary focal points. In that colors outside of the dichromatic scheme were first introduced in the form of the yellow question mark—itself a signifier for the meaning that lurks behind the term, 'actually'—and again with the introduction of the infographics that orbited the icons of tablet, home, and mechanical arm, it is not leap of logic to read color as signifying the meaningful components of IoT. Within the shopping mall scenario, it is thusly apparent that the objects, the likely mass-produced things-turned-objects in all of their non-specificity, are the primary 'things' of IoT. But the extent to

which they are things in this sense remains somewhat uncertain: while it is relatively easy to imagine augmenting toys with sensors (e.g., "Mom, I lost my rubber duckie!" / "Okay, honey, I'll find it with the iPad."), it is somewhat difficult to imagine a similar use of sensors relative to the flowers on sale on the top floor. Surely, as in the case of already developed IoT devices, it would be possible to monitor the water levels and the growth of plants using sensors. (It is worth noting that the existence of these devices was short-lived—the company that produced them no longer does so.) Such a usage of sensors would not be categorically the same as implanting sensors in a toy. Sensors monitoring the water levels or growth of plants, unless directly implanted in such plants, would be more like peripheries than actual augmentations or prosthetics. Such sensors would be plant-adjacent, creating a technologized system to which the plant belongs… What *is* certain is that these colored objects, however they might fit together in an ontological, taxonomic sense, begin to paint the horizon of IoT. That is, when the ways in which we might interact with these objects is taken as foundational, and these means of interaction are augmented by the addition of sensors, a realm of experiential possibilities begins to come into view. This realm, however, is always already defined (within the context of the imaginary presented in this video) as a function of extraction. It is the point at which the extracted, the data and the informational, is fed back into the experience of interacting with the extractive objects that the experiential possibilities begin to morph or evolve from their current state. At this point, however, it is still a blurry vision, an ill-defined silhouette or impression of potential experiential possibilities. Further analysis should help clarify.

As the camera pans further to the right, the shopping mall disappears past the left side of the frame, and the viewer is met with a representation of a home. As the narrator says, '[…] or optimizing energy generation and consumption,' a two-story home fills the bottom left quadrant

of the frame. (See Figure 18.) Behind it, amidst the ever-present blue, the viewer sees a nuclear cooling tower, three wind turbines, and what appears to be a hydro-electric power plant. The wind turbines are presented in stark white, while the cooling tower and the hydro plant appear in the now-familiar bluish grey of extant infrastructures. In the foreground, to the right of the house, the viewer sees a configuration of trees nearly identical to that which stood next to the shopping mall: one oval tree and two circular ones. The space between the trees is punctuated by the presence of a bright orange convertible. It resembles a Volkswagen Bug and speeds off to the right side of the frame.

Figure 18. A green smart home in IoT.

The house itself is presented in various shades of green and earth tones. The single-story garage has large electric outlets on its side—likely referencing the place that electric cars has in the imaginary of IoT. The house's living quarters are partially visible through an invisible fourth wall: in the upper story, the viewer sees a man, white, standing in a bathtub under a shower head. The roof above him is covered by six solar panels. The upper floor also houses what appears to be an

office or bedroom where a female child sits in front of a computer at a desk. The bathroom is presented in a tan tone, while the bathtub and shower head and the girl's room, desk and computer, are presented in various shades of green. A skylight appears in grey on the roof above the girl. The ground floor of the house contains the kitchen, where a woman stands performing some kind of action next to the oven. The kitchen appears in the same tan tone as the bathroom above it, but the appliances—a refrigerator and freezer combo, a ventilation hood above the stove, an oven/stove combo, a dining table and a bag of groceries—all appear in shades of green. The symbolism here should be apparent: these of green and earth tones suggests that these objects, already belonging to the imaginary of IoT because of their extra-dichromatic coloration, belong to a realm of IoT that is 'green,' or eco-friendly.

In addition to the rhetorical focus on energy issues and sustainability, the semantic absences from this image of a home are particularly important. The focal points of this image, denoted by their coloration, are infrastructural. That is, they are objects that affluent, western would-be-Moderns tend to take for granted: refrigerators and ovens, desk space in a bedroom, automotive transportation, and a reliable power grid. (I posit that each of these objects and systems can be considered infrastructural based on a core idea presented by Susan Leigh Star: infrastructure is invisible in a state of functionality, but visible when broken. In my own personal experience, this certainly applies to such objects as refrigerators and stoves and power grids.) Those parts of the image that fill the negative space alongside these infrastructural elements, however, say as much in their absence about the solutionism of IoT as do the imaginary solutions to which the video directly alludes. The absences to which I refer are humans and human activities. While these absences will be discussed at some length in following sections, it is worth bearing them in mind.

5.2.8 "The Big Picture"

Following the scrolling and brief presentation of these three scenarios (medical outcomes, shopping, sustainability), the narrator finally arrives at the meat of the video: 'the big picture,' as he puts it. As the orange convertible speeds to the right side of the frame, through the well-groomed trees and away from the sustainable house, the camera speeds faster in the same direction. The viewer sees brief, side-scrolling glances at grey buildings in a cityscape, as well as three CCTV cameras. (See Figure 19.)

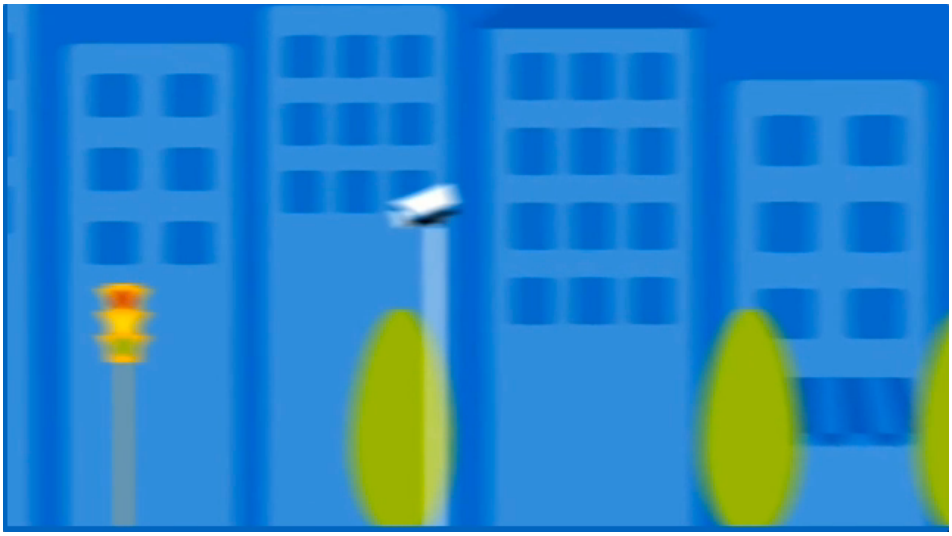

Figure 19. Layers of IoT-enabled objects, blurred from camera motion.

As these cameras whir past, the narrator continues: "Here's an example of the big picture. Imagine an intelligent device, such as a smart traffic camera. The camera can monitor the road for congestion, accidents, and weather conditions, and communicate that status to a gateway that combines it with data from other cameras, creating an intelligent, city-wide traffic system."

As these words are spoken, the camera zooms out to reveal a street lined with trees, a sparse cityscape in the background. The Terminal Building from earlier in the video makes a return,

populated with screens of brightly colored infographics. A dotted line is drawn to connect the initial smart traffic camera with a gateway, which is represented as a small box on top of a long white pole roughly one and a half times as tall as the camera itself. As the camera pans out, two other smart traffic cameras appear in the frame lining the road. Dotted lines also connect these cameras to the gateway. Another dotted line then emerges to connect the gateway to a white cloud that floats above, which is, itself, connected by another dotted line to a row of servers in the Terminal Building. The words, 'City Traffic Camera System' float above the Terminal Building; a yellow bus appears at the point at which the building meets the street. It proceeds in a leftward motion towards the network of traffic cameras. (See Figure 20).

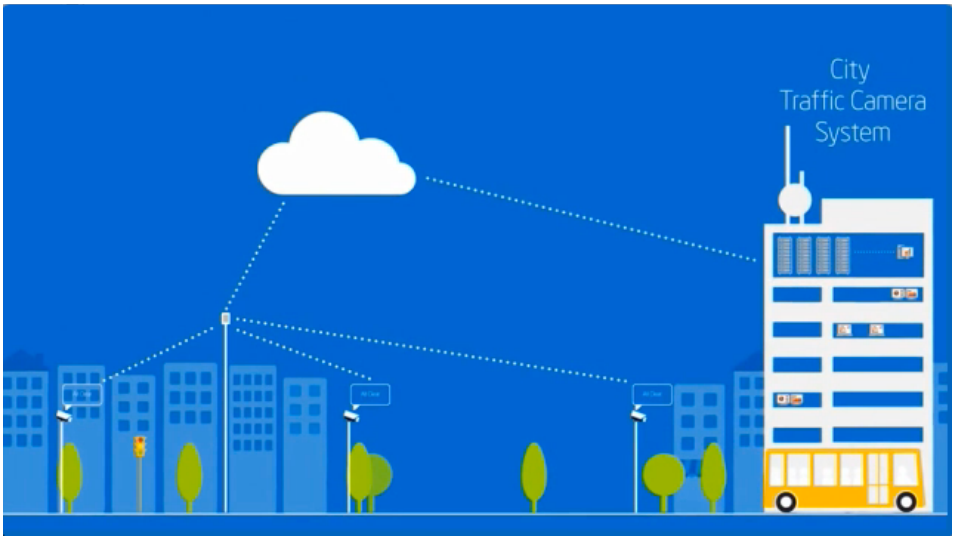

Figure 20. City traffic camera system. (One system of many.)

The camera rapidly pans out further as the narrator says, 'Now, imagine that intelligent traffic system connected to other citywide transportation systems, which get data from their own intelligent devices, creating an ever-larger, intelligent system of systems.' (See Figure 21.) A plane flies diagonally across the upper left quadrant of the frame; the sun shines in the upper right. Two other buildings appear in the frame: one is labeled 'City Transportation System;' the other, 'City

Smart Meter System.' Dotted lines connect these buildings to busses on the street, a subway system that passes leftward below the street, and to an off-screen 'City Airport System.' Multiple clouds, each connected by dotted lines of data to various vehicles, punctuate the space between buildings.

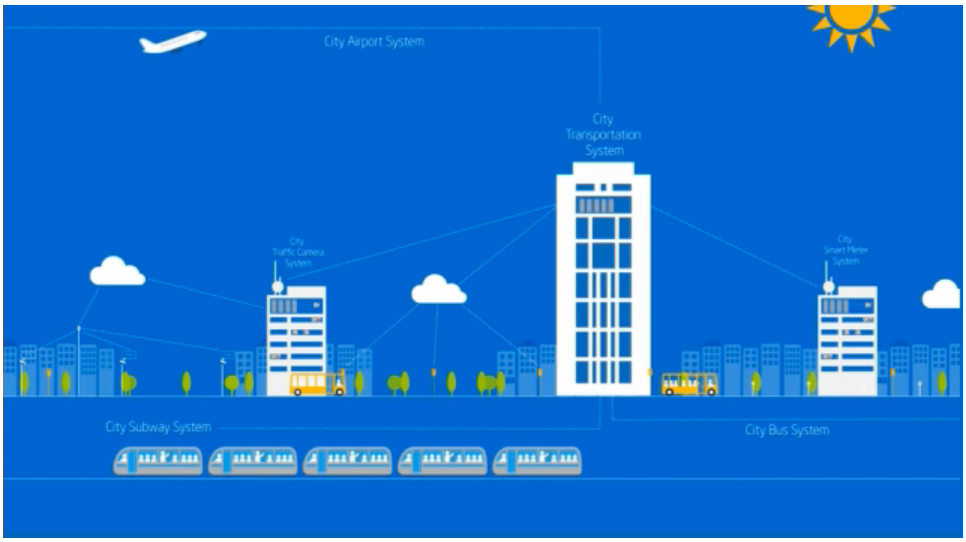

Figure 21. An ever-larger, intelligent system of systems

'The really big possibilities,' the narrator proclaims, 'come from analyzing the end-to-end data from across these systems.' To emphasize this point, the following text appears in white lettering against the blue sky: 'big possibilities come from analyzing the data across that system of systems.' (See Figure 22.) Large circles containing the now-familiar brightly colored info graphs appear from the dotted lines of data that connect the buildings public transportation vehicles. Here, at this point in the video, the city itself is becoming networked.

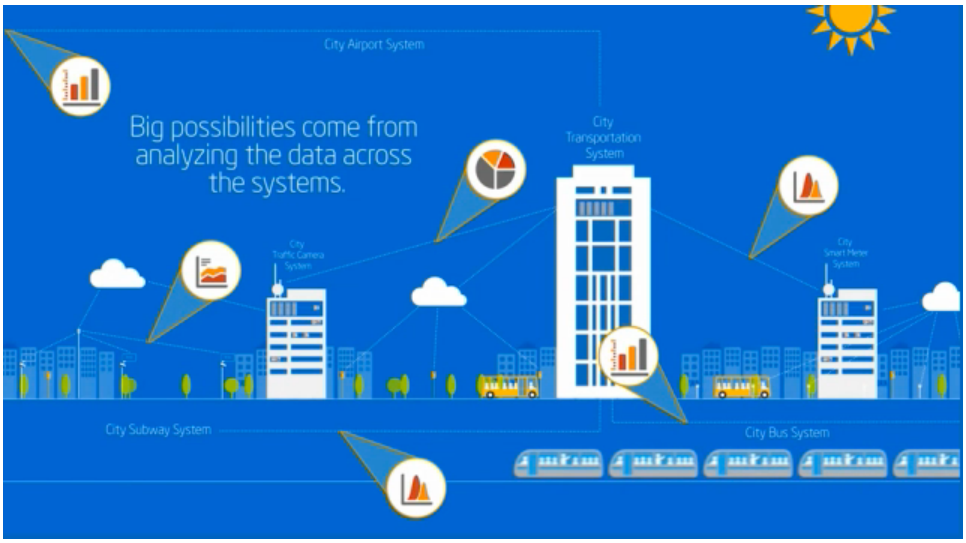

Figure 22. "Big possibilities come from analyzing the data across that system of systems."

The narrator provides an overview:

> For example, let's say the city's intelligent traffic system detected massive congestion due to an accident. That insight can be sent to the citywide transportation system, which can analyze the accident's impact on other city systems. Recognizing the accident is near the airport and two city schools, it could notify those systems so they can adjust flight and school schedules. It could also analyze and derive optimal routes around the accident and send those instructions to the city's digital signage system to guide drivers around the accident. And that's just one example of the potential benefits that can happen when intelligent devices share insight with other systems, forming ever-expanding systems of systems.

The graphical content of the video unfolds largely as one would expect it to, given the precedents set in the roughly minute-and-a-half that has preceded. However, at this point, the scrolling motion which has up to this point occurred in a rightward fashion, now switches. The camera scrolls downward and to the left—the boundary of forward motion has been set—zooming in on a blue hatchback car driving leftwards over a grey aqueduct-style bridge. Above it, the viewer sees something odd: a light blue line meanders from the top left quadrant of the frame to the center right. (See Figure 23.)

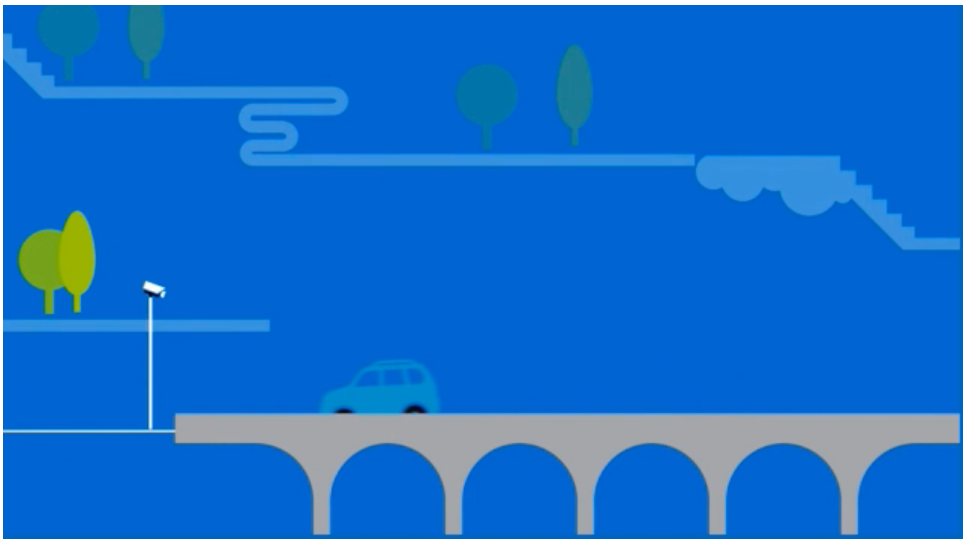

Figure 23. A light blue squiggle.

It is sparsely accented with trees of green, though a less saturated green than has previously characterized trees. Here they blend with the blue of the background. More than the relative transparency of the trees, though, what renders this line so odd is that it is punctuated by segments that resemble stairs, which are preceded by cloud-like configurations. The overall effect is an homogenization of infrastructure and natural elements, an implicit blending of the natural and the artificial. The straight portions of the line, as well as its curvilinear portions, clearly represent a road. (The hard curves and downward trajectory of the curvilinear portion are immediately reminiscent of Lombard Street in San Francisco.) But the steps that aid in the road's descent down the frame, hint at a mixing of transportation infrastructures. Their presence alludes to the inclusion of foot traffic in the citywide transportation system that is being described. More than that, the graphical marriage of these stair-like objects with a cloud configuration serves to further flatten an otherwise artifactually rich and heterogenous ontology. The synthesis of street, cloud, and stairs not only evokes the stairs' and street's place within the IoT sensor network—connected to the 'cloud' as it is by gateways—but the presence of the cloud as visual metaphor also seems to imply that the natural world also belongs to such a network.

Through this one squiggled line—no less confounding than the infamous squiggle of Tristram Shandy (Sterne, 2009) deftly inscribes the world writ large (people, sociotechnical infrastructures, and natural occurrences) into the imaginary of IoT. Those objects that previously existed in separate categories (for this Moderns this occurred via the troublesome dialectic of the natural and the social) are now tentatively thrown into one. The graphical lexicon of the entire video up to this point has been building to just such an insidious, latent conclusion: the uniformity of curvatures, the use of basic shapes and colors to represent objects as ontologically diverse as 'the Earth,' 'a woman,' 'a plant,' 'a car,' 'a road,' a nuclear cooling tower,' and 'a child's toy,' all lean towards a subtle homogeneity, a structural breakdown of categorical silos. Such a reading of this graphical content is supported by the repetition of 'system of systems.' If the primary characteristic that defines a system is the connectedness of multiple entities in service to a greater function, then 'systems of systems' imply widespread connectivity between otherwise disparate entities. In such connectivity, one finds the potential for ontological shifts, for breakages and reconstellations of previously extant categories and classifications. This line, perhaps more effectively than any other graphic heretofore presented, launches the reader through the looking glass of IoT; this line in its chimeric infrastructural properties, stands as a non-verbal summation of the imaginary of IoT presented in this video.

But the car continues on across the bridge, apparently blind to the world that constitutes its own background. It approaches a smart traffic camera at the end of the bridge and stops. An orange station wagon speeds along the bridge behind it and rear-ends it. A comical puff of smoke arises from the collision. A word bubble emerges from the smart traffic light that reads, 'Accident!!!' (See Figure 24.) Six or seven cars begin to queue behind the accident as a dotted line of data speeds from the camera to the upper right quadrant of the frame.

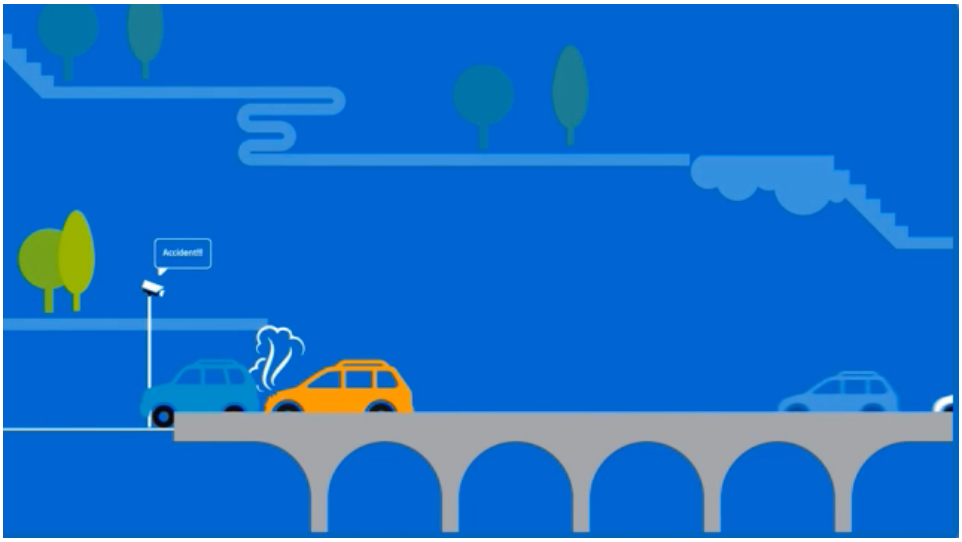

Figure 24. "Accident!"

The camera pans to the right, following the path of this dotted-line-data from camera to cloud, to Terminal Building—a sign of implicit forward motion in a technological sense—to the building marked 'City Transportation System.' As the narrator says, '[…] which can analyze the accident's impact on other city systems,' a dotted-line-to-nowhere emerges from the top of the building, as does one that extends to the bottom right quadrant of the frame. (See Figure 25.) Data is flying everywhere. The camera then pans out and scrolls quickly to the left, revealing an airport at the bottom of the frame (populated by two airplanes and an air traffic control tower), a bright red school house in the middle of the frame, as if in the distance beyond the airport or on a hill overlooking it, and another series of three homogenizing squiggles. Dotted lines appear on the screen from the right side of the frame to connect the school and the air traffic control tower, and subsequently a fleet of school buses and the two taxi-ing airplanes, with the data from the City Transportation System.

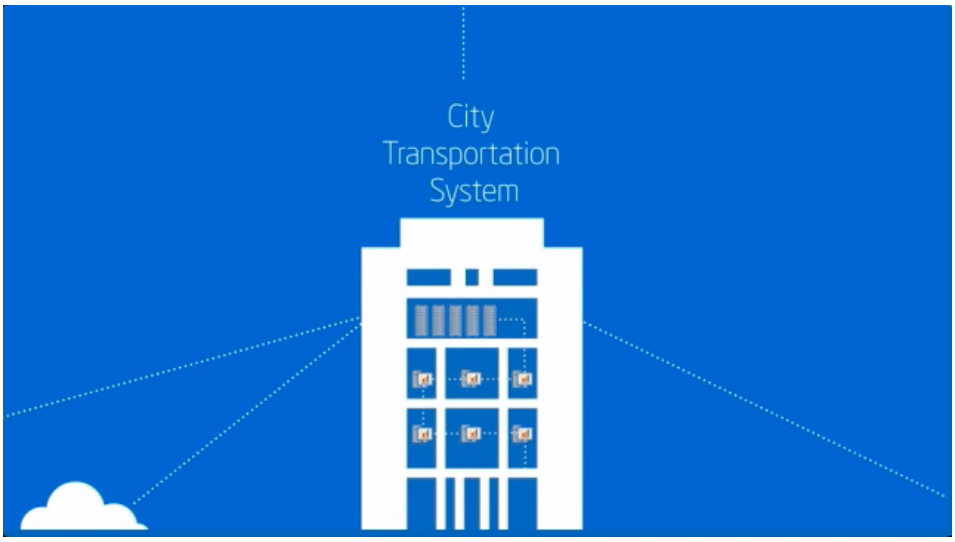

Figure 25. "'[…] which can analyze the accident's impact on other city systems."

As the narrator highlights the analytical capabilities of such a system of systems, the camera pans quickly to the right and zooms in on the Transportation building, which like the Terminal Building, contains a row of servers on the top floor and a connected group of computers below. An animated dotted line shows data flowing in a linear fashion down the building from servers to computer to computer, etc.. The animated line stops its motion and the dots that comprise it are enlarged and bolded when the narrator suggests that analysis will yield the 'deriv[ation of] optimal routes around the accident.' The camera again pans hard-left to show still another dotted line of data flying to the city's 'digital signage system,' the representative of which reads, 'Exit now to avoid traffic delays.' (See Figure 26.) A red Jeep stopped at the sign then descends down a hill, though a descent characterized by a thin line rather than the background squiggle-and-steps configuration. It passes quickly beyond the gridlocked bridge on which sit the impacted blue and orange cars and the fleet of seven stopped automobiles. As an end to this happy story, the camera pans out to reveal the whole iconography of this 'intelligent system of systems.'

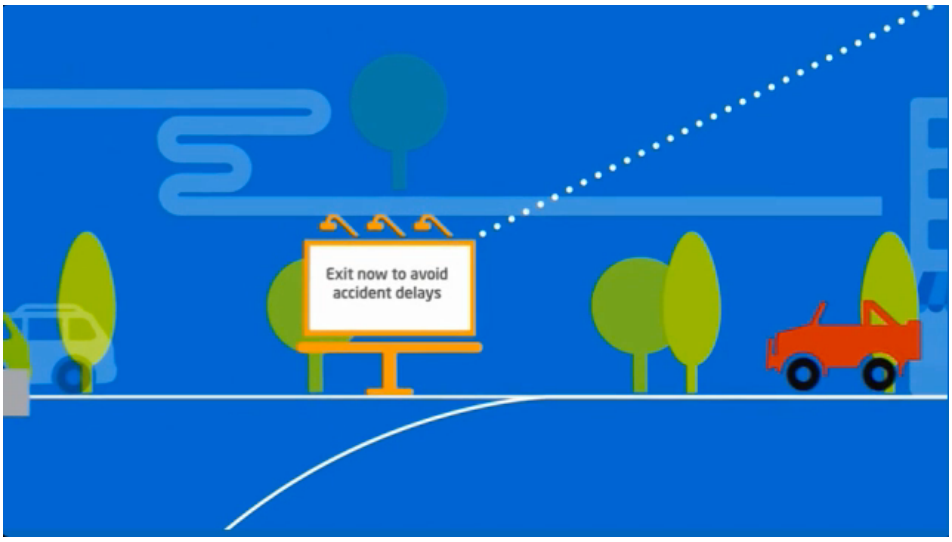

Figure 26. "Exit now to avoid traffic delays."

As the camera continues to pan out, a full cityscape is revealed. (See Figure 27.)

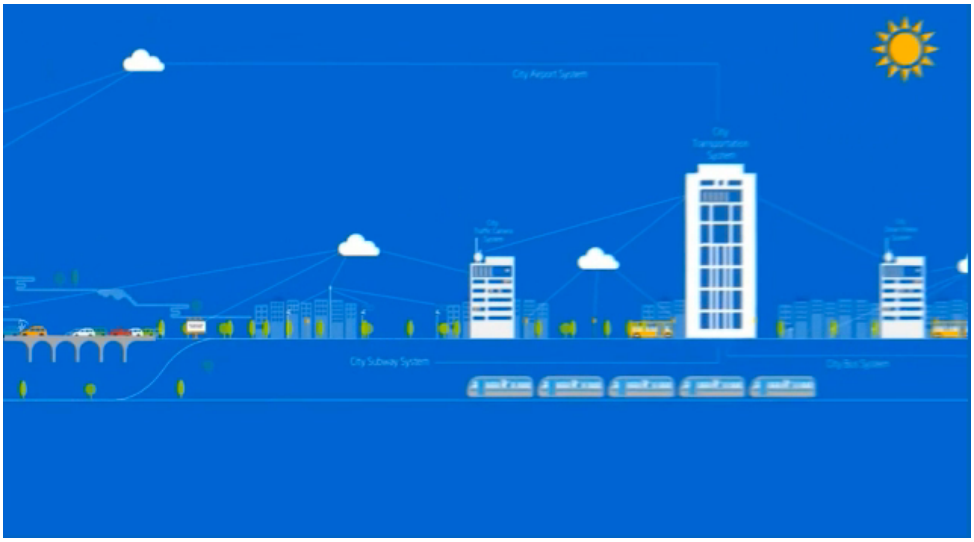

Figure 27. Panning out to full cityscape.

Soon, this cityscape of traffic accidents and buildings chock-full of servers and infographs is encircled by a thin white line. (See Figure 28.) This encircled cityscape replaces the Earth icon that opened the second segment of the video. It remains, however, connected by dotted lines to the initial constellation of sets described above. (See Figure 29.)

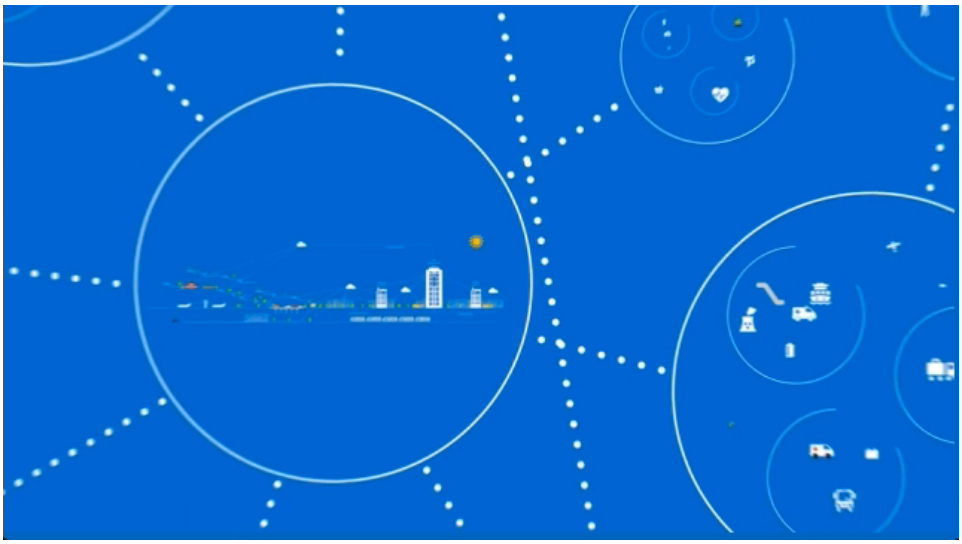

Figure 28. The city as one of many systems within a system of systems.

Figure 29. Many systems of systems.

The narrative presented in the video's second segment has come full circle. As the second segment shifts into the third by way of the narrator's use of the term, 'we,' the whole constellation of icon-sets connected to the cityscape by dotted lines dissolves into the Earth icon. It sits at the center of the frame appended by a question posed beneath it: "But how do we get there?" (See Figure 30.)

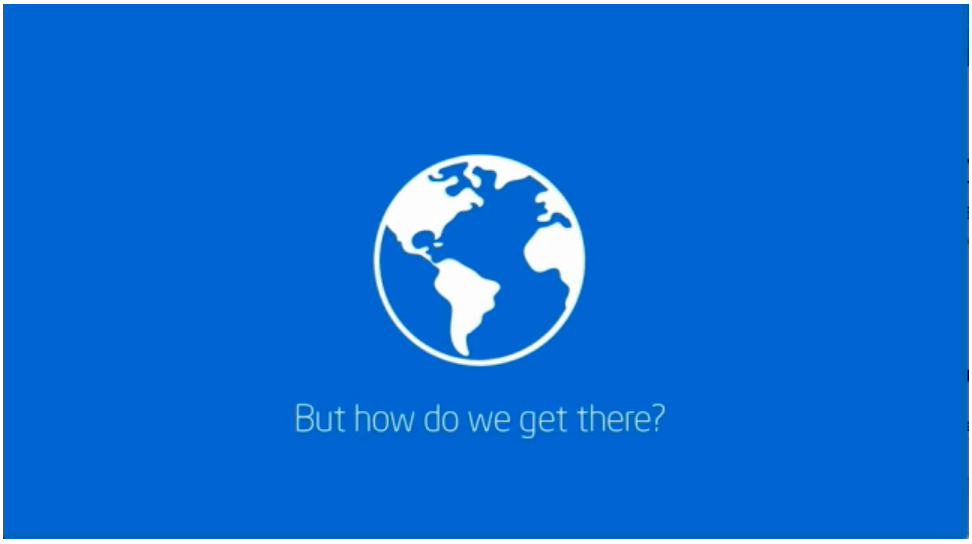

Figure 30. Coming full-circle.

5.2.9 The Third Video Segment: 'How do we get there?'

Unlike the question posed at the beginning of the video, this text that signals the beginning of the video's third segment and its punctuation are all presented in white. It is a simple font, a thin sans-serif: un-ornamented, unequivocal, and without frills. The use of the term 'we' is significant. The video began with a direct address, 'you,' which immediately highlights the space between the narrator and the viewer. As the narrator proceeds with an illustration of IoT a broad framework, three brief, predominantly visual scenarios, and one somewhat more in-depth scenario, he arrives at a point of unification. With the use of 'we,' there is no longer a distinct or implied separation between narrator and viewer: they are of the same group. The act of viewing the video's contents, of following the narrator's thread, has served to dissolve whatever gap initially defined the categories of 'narrator' and 'viewer.' 'We' implies an effective enrollment of the viewer.

The narrator continues:

> ‘Regardless of the solution, Intel processors are designed to help you get to market faster and easier. You can scale solutions across a variety of performance, power, and price points with a single set of application code that runs on every Intel processor. So what will you develop to help drive and accelerate the Internet of Things? We’d love to help. So please contact your local Intel representative or visit us on the web at www.intel.com/iot to find out more.’

As the narrator pauses before saying, ‘Regardless of the solution, […],’ the Earth icon dissolves, as does the text beneath it, to reveal a brief moment of pure blue. As quickly as the icon and text faded out, six new icons appear, accompanied by descriptive text boxes below them and the following printed statement above: ‘Intel processors are designed to help you get to market faster and easier.’ (See Figure 31.)

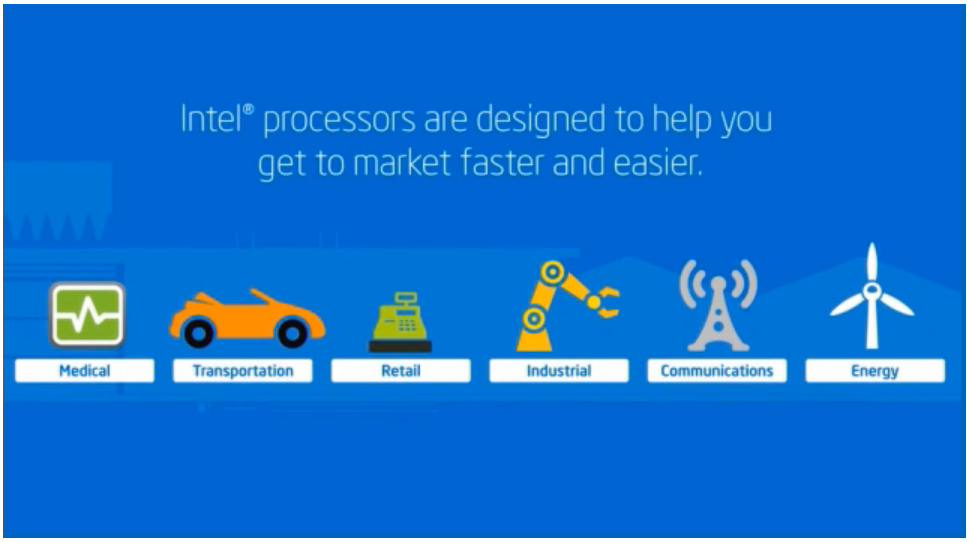

Figure 31. “Intel processors are designed to help you get to market faster and easier.”

The six icons are as follows: a green square containing what might be interpreted as an EKG reading accompanied by the word ‘medical;’ an orange convertible automobile accompanied by the word, ‘transportation;’ a green till accompanied by the word ‘retail;’ the now-familiar yellow mechanical arm accompanied by the term ‘industrial;’ a grey communications tower accompanied by the word ‘communications;’ and a white wind turbine accompanied by the word ‘energy.’ In

the first clear presentation of an ontology, it becomes apparent that each of the scenarios and constellations of icons were intended to elicit this hexagonally faceted imaginary of IoT. As the narrator says the words, 'Intel processors,' six yellow boxes appear on the screen. Each one sits below one of the six text boxes that describe the icons above. They read,' Intel Architecture." It is, at this point, apparent that the narrative constructed over the duration of the video serves to enroll the viewer in a very particular imaginary of IoT: Intel's imaginary. Although this was certainly apparent to the viewer via their engagement with the email and landing page, the ubiquitously present Intel logos and color scheme, the term 'Intel' has not previously been used in an auditory way. The 'we' to which the narrator refers at the beginning of the third section is now clearly a relationship characterized by commerce: the viewer and narrator are now transformed into consumer and producer, respectively.

Such a transformation into the realm of commerce should come as no surprise. But the fundamentals of a relationship between consumer and producer are not necessarily relevant enough to this project to read closely here. What is, however, relevant is the transformation itself. Just as the notion of 'systems of systems' presented in the video alludes to a highly flexible ontology, the transformation from viewer to implicit, market-based consumer echoes the ontological flexibility of a world defined by IoT. The viewer becomes prospective consumer by way the tentative enrollment that results from engagement with the email-webpage-video text.

As the narrator continues his now-apparent pitch for Intel's vision of IoT, the six icons described above dissolve and are replaced by icons of Intel processors that emerge from them. (See Figure 32.) These processors are represented by four icons of varying sizes. Increasing in size from left to right, they are the Intel Quark processor, the Intel Atom processor, the Intel Core processor, and the Intel Xeon processor. Text appears above the processor icons: 'Scale solutions

and a single code set across multiple platforms.' The word, 'Performance,' appears below the processor icons, as does a yellow arrow pointing to the right: the combination forms an ***x***-axis. The x-axis creates an ordinal scale of processor performance.

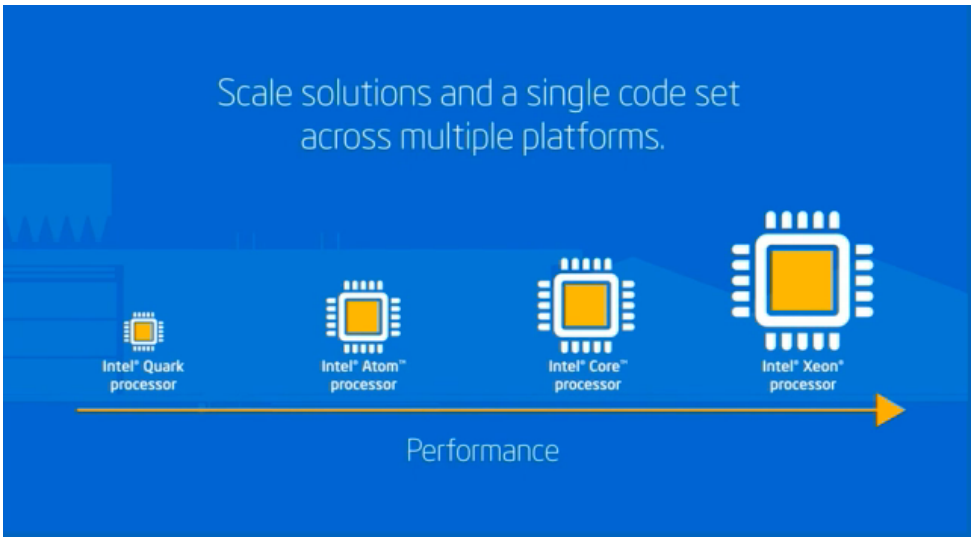

Figure 32. "Scale solutions..." and "Performance."

The background of the frame, behind the scaling processors and text, is filled with another odd graphic—odd in that it is reminiscent for the squiggle that appeared earlier, blending road and hill and stairs. The processors' background here appears again to blend the obviously artificial with the obviously natural: at the left side of the screen, in a lightly saturated blue color—just lighter than the ever-present blue background—a building can be seen. It is squat and long and appears to have a garage door. It is an industrial building. Above its door, there is an uninterpretable structure. It is graphically constructed from a long rectangle and six downward-facing triangular shapes below it. (It almost appears to be a cistern, or some kind of container.) As the viewer's eyes move to the right of this structure, its shape changes. It is ornamented with what look like four small antennas. The rectangular character of the shape, however, drops off into slanted lines beyond a nearly imperceptible awning that hangs off of the building. These lines to the awning's right and

largely obscured behind the processor icons, give the appearance of mountains or performance graphs. The message of this background image appears clear, even if that which it is intended to represent (or the intentionality of its representation) is unclear: this is a hybrid, synthesized image. It is comprised of heterogeneous shapes, but appears as one distinct figure. The building and the world beyond appear as parts in a unified system defined by their coloration.

The words, 'your code,' appear between the text and the processor icons. As the narrator indicates that a single set of code can be used to run each class of processors at various scales, the words 'your code,' multiply four times and slide down to sit atop the processor icons. Almost as soon as the words move to their position above the processors, they disappear. The strange industrial-ecological figure that comprised the background fades out and the scalable processors, now animated, move around the screen. The cityscape that was present during the lengthier transportation scenario appears and the processors disappear. This time, however, the cityscape is accompanied by additional text: "So what will you develop to accelerate the Internet of Things?' The camera begins a slow pan out as a series of subway cars move across the bottom of the frame, beneath the street and well-groomed trees, the large grey buildings, busses, smart traffic cameras, and a network of dotted lines that connect these objects, via a cloud, to a massive building. The only major characteristic of this building's interior is a server farm on the top floor.

But something odd has happened here. Up to this point, the graphical rhetoric—the appearance of a network of icons that surround an Earth, then feed into it and are described through four scenarios—has progressed toward a unification, an imaginary of IoT where IoT comes to describe and characterize systems at a planetary level. That is, the rhetoric has quietly constructed a unified Earth-IoT hybrid. But as the text on the screen and the narrator ask, 'what will you develop to accelerate the Internet of Things?', this unification is undone. As a standalone subject, IoT breaks

away from its larger planetary and social contexts. It again becomes something unto itself. We see then that IoT has modular characteristics: it is something that can be added to an extant system, subtracted from an extant system, or possibly built on its own separate of an extant system. It appears, then, as a prosthetic: a pair of glasses, a blind man's cane, an artificial memory. Although this is not a fully appropriate point to delve into this notion of prosthesis, such a notion will be of central importance later.

The cityscape dissolves into a solid blue background; the video begins its denouement. The exegesis of constellated icons, of homes and production lines, of a city itself and the streets that define it, has given way to a direct sales pitch. The viewer is encouraged to contact a local representative or to consult Intel online for further information. And as if taken from High Windows by Philip Larkin, the richness of the icons that constituted the video's protagonists gives way to the blue of a screen and white trade-marked text: 'Look inside,' and then the Intel logo, like high windows and sun-comprehending glass that is nowhere and nothing and endless.

5.2.10 A Problem of Scalability

In the act of enrolling viewers into a highly specific, yet flexible, imaginary of IoT, this video forgets itself. The enrolling text—beginning with the email and Professor Y, then the landing page and its taxonomy of potential users, and ending, for now, with the introductory video—begins by building the viewer as a student, a learner seated at the precipice of a great future, an IoT of blue and white and intelligence, extraction, and systems of systems, and ultimately shuns the very experiential aspects of the world that give rise to learning. The imaginary of IoT presented through this text is one where the object is central, where networks and systems are derived from their relationships to the objective 'thing,' rather than the subject-object constellation that comprises a

thing. In all but one sense, the human viewer—the subject that would couple with an object to produce a thing—is rendered categorically as an agent of extraction. Such extraction has at its core the maintenance and promotion of what Herbert Simon refers to as the sciences of the artificial (Simon, 1996).

The text forgets its basically human viewer. In constructing a viewer who envisions a world of IoT as it pertains to the infrastructures of commerce and urbanization, it implicitly erases—or forgets—the infrastructure of daily life, of the mundane. It forgets the moments of experience from which data are extracted. Like capta for Johanna Drucker (2014), the data that is extracted by IoT devices—these systems of systems—is divorced from itself, from the experiential world that gives rise to it. In the fundamentally reductive process of data collection that exists within this particular imaginary of IoT, it is difficult or requires too great an amount of optimism to see validity as it pertains to the subject, the user—to the human that resides at the core of both those terms (Lamb & Kling, 2003). This is, perhaps, an effect of the scale of the video itself. In that the video is presented a vision of IoT that is scalable to such a great extent that it can be spoken of at a planetary and societal level, it locks itself in to framing the description of IoT at a scale that is greater than that of an individual, greater than individual experience. In constructing an imaginary of IoT that is capable of scaling to even the largest systems, it forgets the smaller scales, the living and daily rhythms of human users that co-construct these larger scales. This is an IoT of businesses and solutions and huge systems: systems of systems, as the narrator says.

Prior to moving on to a closer analysis of this video—a summary and initial construction of a set of relevant discourses—it will be necessary to compensate for this problem of scalability. If, as I maintain, it is of central importance in designing IoT to consider human interests, or the often forgotten or overlooked aspects of daily life that an IoT will always already impact, then examples

of IoT that exist at this daily scale of life must be analyzed. To this end, the next section of this chapter will be devoted to four such examples. Two occur within a single-family home; two occur at the individual level. Each will, in their own way and again in a cumulative effect, augment the large scale IoT of Intel's introductory video with a smaller scale, daily IoT.

Following description of these scenarios, the remainder of the chapter will be devoted to analysis of the videos and the construction of an initial list of themes that emerge from the videos: characteristics of the imaginary of IoT as it is assembled through the synthesis of these promotional materials These themes will be treated as the traces of discourses that subtend the imaginary of IoT, aspects of the historical *a priori* that gives rise to IoT and pushes, however gently or forcefully, into the future. The identification of such traces will provide the theoretical and methodological impetus for the critical literature review that comprises the second chapter.

5.3 Symbolic Media, Real Messages

In Chapter Four, I highlighted the need to analyze the ways in which various media formats are used to describe the futures of IoT based on the topic I found most relevant to the notion of discursive change:

> Future blog wearables good post testing read systems work robots security solution case google robot startup step brand article video

The argument underlying this point is as follows: if given media formats couple with human perceptual and cognitive abilities to generate communicative affordances—or, broadly, sets of actionable potentials that are relevant to knowledge production, including action in general, where

action is considered a form of communication with the environment and its constituent parts—then it seems possible that different media formats are capable and incapable of expressing or potentiating descriptions of certain aspects of imagined futures. Each format, based on the affordances that arise between subject and inscribed object, primes the subject to think of—to envision and imagine—the future in the modes of interaction best suited to the inscribed object.

For example: written language has a flow to it. English and the majority of Western languages read from left to right and top to bottom. The substrate or media format that is used to hold and carry that flow dictates, as per McLuhan, the message itself. That is, the substrate bounds the message and therefore constitutes it.

In the case of pre- and post-codex written language, the three-dimensional plane used to carry written language limits the possibilities for how that language can be organized and therefore read. (One thinks of certain experiments in concrete poetry undertaken by Mallarmé [Mallarmé, 2011] and e.e. cummings [cummings, 1994], or Vilém Flusser's 'Immaterialism' (Flusser, 2015a) to further illustrate this point: the page—its physicality—is not unlike the formal restrictions of a sonnet or a sestina. We, the writer, work within its confines so as to produce a message that is, itself, the medium.)

The page is as a container, both physical and conceptual, for the inscriptions it carries. It does not readily handle depth: the reader does not read behind the words as they stand on the page, or into the words; nor does the reader read above them or beyond the edges of the page—one may read 'between the lines,' but this common phrase only serves to illustrate my point: to 'read between the lines' is to acknowledge the overt shortcomings of written text; to place the interpretive emphasis on the reader rather than on the written; to understand the written text as a *text* that extends beyond itself into the realm of reader response and reader associations, literally

to the space between the lines where blanks are filled with interpretation and inference. Even in the case of such voluminous tomes as Delillo's 'Underworld' (DeLillo, 2007) or the multi-volume set of Proust's *A La Recherche Du Temps Perdu* beginning with *Swann's Way* (Proust, 2015), the depth of the book—its physical depth as a three-dimensional object—is inaccessible to the reader as they read. (In the case of Homer's Odyssey, if presented in its original spoken format, depth goes out the window entirely, being substituted for the even plane of time—the processual march of heartbeats and cochlear perception.) One simply does not see through the page or read beyond the plane that meets their eye. The depth of reading, the depth of the written word as it stands on the plane of the substrate, exists not on the plane itself but when that plane is coupled with the reading agent: in the mind the page gains its depth. (Perhaps, too, with the birth of genre—one knows when to expect the solution to a murder mystery—but I will leave that portion of the argument to literary scholars.) And perhaps this is key: the substrate that carries inscription not only constitutes a positively defined physical-semantic space, but also alludes to a negative one: a space off the page, a space where associations are made: a space where text becomes *text*.

This space where text becomes *text* is necessarily the cognitive space of the reader, be that the mind in the sense of simple Cartesian dualism or the embodied mind or distributed mind. But the nature of that space—the possibilities for associations, for *types* of associations—is primed by the physical-perceptual characteristics of the substrate itself. An idea communicated (presented: the phenomenon that appears) through written English seems primed for mental manipulation—for interpretation—along the same linear lines as the text itself: even those attempts to move beyond traditional linearity (as in cummings or Mallarmé, as in the cut-and-paste methods developed in the 20th century) are born of such linearity. They stand in the face of such linearity, always already

defined against the standard that linearity bears. (*Ceci n'est pas une pipe*; these words are not words, but text.)

The question is this: how do representations (communications) of the imaginary of IoT differ between communicative formats: is there a non-linearity (perhaps a diagrammatics?) of IoT that is absent from writings about it?

If, as we have seen in the analysis of the Intel video above, much of IoT is non-linear, but rather network-based—massively scaled between myriad inter-networked devices—then the vision of IoT presented via text alone must necessarily fall short of describing the full possibilities, the full potentials of IoT. Linear text alone simply cannot, by virtue of its construction and relation to the medium that carries it (both literally and historically), fully represent the emergent discourse network that is IoT—let alone the imaginary of human life that arises from and in concert with that discourse network.

And yet, here we are. We are engaged in, and have been engaged in, what I refer to as an act of translational distanciation. I have translated a video to a written text. In some ways, then, I am borrowing from Peter to pay Paul; substituting one media format for another as though one might provide us with a greater sense of truth than the other. Needless to say, this is problematic.

But this is a necessary evil and one that demonstrates the concretized role that media formats play in knowledge production, in the production of 'the thing' and 'the human.' This is a dissertation. A dissertation is written. All analyses included in the work of this dissertation must, at one point or another, pass through the state of text (like a solid passing into a liquid state). So, we must in some way at least, deal with text; we must pass through the state of text to achieve what Flusser referred to as the circle of mystical thinking. This is a circular, uninscribed form of thinking that most closely approximates 'the future.' This is the realm where concepts are

constellations, not linear arrangements: there are no statements, only the building blocks of statements. In the present situation, communicating through textual description is the best possible means of identifying, describing, and communicating the mystical-cyclical concepts that form the possibilities of the future in a durable way.

IoT is a future. More than that, it is an imagined future that arises from a set of potential futures. In that it is imagined—and by this, I mean it is envisioned as a set of possibilities contained within a future-oriented imaginary—it must be *described* to be known, rather than *experienced* to be known. (One cannot experience the imaginary, only envision it, or infer its existence based on the experience of the archival set in which one lives: in Bertrand Russell's terms, the future is only ever known by description, never by acquaintance [Russell, 1951a].) Paradoxically, the means by which the future is described—text, video, diagram, spoken language—ground that future not in its own realm, but in the realm of the past, of the long present tense that extends into the past. The future is dreamt of through the media cages of the past from which it hopes to emerge.

Riffing on McLuhan: We see the future through a rearview mirror, but not as a reflection within that mirror. Rather, we see the future through the shape of the rearview, through the physical limitations and possibilities that the medium of the mirror allows, an n-dimensional semantic space defined by the physical-cognitive characteristics of the media that produce and carry the message. Given that IoT represents an apparent discursive transformation within the greater archive—or the emergence of a new discourse network, still within the greater archive that contains ***n*** discourse networks—the full extent of this transformation, the possibilities resident within the imaginary of this transformation, cannot be adequately described by text alone. Nor by video alone. Nor by the spoken word alone. Rather, the imaginary of IoT must be described through the combination of these, and then, still, only partially. One only approaches an understanding of the full set of

potential discourses of the human within IoT through the abductive analysis of the simultaneous and overlapping representations of the imaginary of IoT as they are presented by those media formats described in Topic Six: text, spoken language, video, diagram.

But we are not yet deep enough into the data, deep enough into the ***n***-dimensional representation of IoT created by multi-modal media formats to undertake the process of speculative deduction. Rather, we are now at a point to begin such an analysis by comparing the ways in which IoT is represented in Intel's email and landing page (text) and in Intel's video.

As one might expect, this analysis relies on the unremarkable assumption that text is, indeed, different than video. But this is not the interesting aspect of the analysis. Rather the differences between text and video become interesting because these well-known and well-critiqued media formats are being used to describe and present visions of an as yet unknown media format—I say 'as yet unknown' because despite the fact that many of us deal with IoT technologies on a day-to-day basis, the full scope of IoT has yet to be realized (if 'full scope' looks anything like the scenarios presented in the video, where 'walls talk'). So then, the present analysis must focus on the means by which the communicative/representative affordances—the coupling of characteristics between subject and object within a communication—represent certain aspects of an unknown technology, an unknown discourse network emerging from such technology.

The textuality of the email, augmented as it is by the photo of Professor Y in his classroom, blends what Kittler would call (in Lacanian terms) the symbolic and the real. That is, and as always must be the case, the textual content is purely symbolic, transferred from the messy realm of the real into the linearity and control of text. The pictorial content, however, gives the initial appearance of being 'real'—it is a captured moment in time that presents as real via the medium

used to express it. But the reality of this moment comes into question when it is contextualized by the text of the email: the picture of Professor Y, while certainly (or almost certainly given the prevalence of digital manipulation via tools such as Photoshop) representative of a moment in time—a moment during which an actor or model portraying the individual who, subsequent to my reading, I would come to name 'Professor Y'—is not representative of a 'real' moment in time. It is, instead, representative of a moment and place whose purpose was the creation of something symbolic: an image for a marketing piece. This is, after all, an advertisement and not a documentary. In this way, the combination of text and image approaches the imaginary in a way that text alone cannot: a moment in time, visual and laden with association, is manufactured and transplanted into a descriptive realm that is always already grounded in the medium of the page.

In actuality, the textual and pictorial content of the email says remarkably little about the Internet of Things. Its content does little to elucidate the question of what IoT is. Instead, the email is used purely as a device of enrollment. Just as text can only (per Kittler) be used to convey the symbolic—and therefore the non-real—the text of the email conveys a hope, an unreal imaginary realm to which the world may, in future, belong. The function of this representation is not to describe IoT in technical terms, or even in functional terms, but to describe the potential relationship between the reader and the world to which IoT might give rise: it is to remind the reader of some hope that the human (implicitly not the one we know now, but *a* human) will reside in the future alongside IoT. It takes the symbolic—in the form of the imagined, the possible—and translates it into a real symbolic.

By 'real symbolic' I mean an inscription of the symbolic that comes with all of the trappings of a real-world artifact: it has physicality by means of the device used to display it; it has interpretability by means of the overlap between its inscribed, linguistic content and the human

ability to read such content, to make sense of patterns and construct inference. In the textual presentation of a possibility, a mere possibility or set of possibilities becomes a *real* set of possibilities, filtered from screen to reader and therefore filtered from the realm of the symbolic into the realm of the real: the human reader, after all, exists in the realm of the real, communicates in the real, and acts in the real. (Here it becomes clear that McLuhan was wrong in his exclusion of the human from the category of media: we are the very form of media he described because we, as jumbled blobs of substrate, are the container for other media.) The content of the email, then, is transferred from the purely symbolic to the symbolic-real by means of its *being an email*—by its very textuality, reliant as textuality is upon the media of the human body to realize its textuality.

In the blending of written text—in sentences, dialog boxes, dropdown menus—and still images, a semantic space is created wherein a new discourse network becomes possible. But not a realized discourse network: a potential one, possibly visible through the deconstruction of the visible portions of the imaginary presented via text. That new discourse network will be born of a medium that reaches beyond text and beyond image (still or moving) and into the realm of the real: into the realm of the symbolic-real that passes, like a tape, from 'real to real;' that passes from the realm of the real into the realm of the symbolic and again into the real, the lived and living world.

The multi-modality of (text + image) allows for a *text* that has depth, or perceived depth. It moves the reader and viewer further away from the realm of standalone inscribed text and into a blended realm of communication: a realm wherein one begins to see the limning of the imaginary of IoT; again the 'real to real.' But this is simply not enough: 'simply' because of the logic I have outlined above. IoT is by its very nature—being concerned with 'things'—not a matter of inscribed text or a matter of image or video, or indeed any inscribed or media-reliant inscription. It is, rather, a matter of those media that lay beyond known media, beyond media that, by virtue of carrying

media, become the message. The realm of IoT, grounded in things, must be a realm where the thing itself is the medium, but an *overt medium and message*. It is not enough to speak of or analyze textual representations or video representations of IoT: we must turn to the things themselves, and in so turning, we must account for the subject that couples with the object. We must turn to the 'things' in IoT as partially human.

But this necessity is unfortunate. The things themselves do not yet exist. One cannot assess a phenomenon that has yet to appear, has yet to make itself known. Such is the fundamental methodological problem of studying futures, of studying future imaginaries that are predicated on potential technologies. We do not have the things to pick up, to co-constitute through the coupling of subject and object as *things*; we have only representations of those things, or at best initial tadpoles of species of things that populate the future imaginary of IoT. And so, then, we are left only with representations. We move readily enough from the realm of the real into the realm of the symbolic, but we lack the experiential access to the final transformation, from the symbolic again into the real, to definitively know the imaginary of IoT and the discursive structure that the human will take within that imaginary. We are left with a somewhat impoverished symbolic-real: one in which 'reality' must fall into the greater category of imagination.

This situation is not as problematic as it may seem. Representations stand always in relation to the interpreter of representations: they stand in relation to the human. (An argument could be made for the idea that they also stand in relation to the computer, but given the phenomenological inaccessibility of the computer-world [its prosthetic archive] and the extent to which IoT logically objectifies the human in terms of that computer-*umwelt*, we are forced to turn our attention back to the human.) So then in attempting to study the potential futures of IoT resident within the imaginary, the greater set of discourse networks contained in a heterogeneous archive, we must

study the representations of IoT in terms of their appearance to the human. And we do this through the careful analysis of those modes of communication to which we have access.

To do so, and in the sections that follow, I turn attention to more context-specific IoT use cases. Whereas up to this point I have considered IoT in generalities—topics derived from LDA analysis, video representations of IoT writ-large—I now turn attention to visions of IoT in the home and alongside the human body. In this way, I seek to ground my analysis of IoT not in terms of generalities, but in terms of the human in human situations.

What can we learn about the future of IoT—the futures that reside in the contemporary imaginary of IoT—by way of filtering it through the lens of the home? Through the lens of the body?

5.4 IoT at the Scale of the Home

The video narrative on which the first portion of this chapter focused presented an imaginary of IoT that exists at the relatively large scale the city. In the remaining sections of this chapter, I will explore similar visual materials—other videos, their narrations, and diagrams—that represent IoT at smaller scales. But, as I contend, these are similar only in that their primary communicative pathway is the visual. Among them, there are a great many differences derived from the means of interaction the viewer has with the viewed object.

Before we move more directly into a discussion of how the imaginary of IoT is represented at smaller scales—the home, the body—I'd like to turn our attention to a summary of some of the characteristics of video specifically that impact just how IoT is represented. Rather than heading immediately into a discussion of IoT at the scale of the home and of the body, I choose to discuss

the materiality of video and its ability to treat IoT at the scale of the city because it is my position that video effects a scalar reduction or transformation.

Video, or moving image in general, is suited to illustrating the invisible. That is, as we saw through the frequent usage of moving dotted lines to indicate an otherwise invisible flow of information, moving image can well highlight the mechanisms of an infrastructure that would otherwise be invisible should that infrastructure be realized. Similarly, through subtle use of panning right, zooming in and out, and panning left, moving image is uniquely suited to the representation of perspective: in this case a perspective that is not achievable through human action alone. The representation of an IoT network via video constitutes something of a 'god trick' (Haraway, 1988): it allows for an otherwise impossible vantage. That is, the moving image becomes a vantage unto itself: it is a technical image (Flusser, 2011b) not only in its technical composition (e.g., through the technologies used to create it), but in that it allows for a view not otherwise achievable through the human body alone that is externalized and then fed back into the internal imaginary, the internal map one might have of how a system works.[124]

Through the viewing of a video, the viewer and the video constitute a thing that represents and communicates future things. The viewer coupled with the object-video transcends the gaze of an individual human and adopts the view of the Other. This view, in line with the logic of Flusser's technical images, is then fed back into the viewer's mental representations of the future, the viewer's imaginary. It becomes a rubric for action, an heuristic for design potentials, but a rubric and a heuristic that is not bound by the embodiment of the human, but rather by projected embodiment. Video funnels a communique through the visual pathway, reducing the viewer to 'just' a viewer; the extent to which the viewer projects herself into the viewed constitutes a

[124] NB: this is not an argument for representationalism, but rather a proposition that users maintain some general sense of how a system works—whether that general sense is accurate is another question entirely.

reopening of the funnel: but all that is embodied via that reopening first and foremost passes through the visual understanding of the world.[125]

The conceptual space that is thusly created between the embodied human burdened with a singular vantage and the representation of the smart city via a video lens (or, rather, the construction of a lens through digital means) becomes the space of potential discursive transformation, but a discursive transformation that is predicated on the statements possible relative to the visual pathway. The construction of the 'thing' between viewer and viewed presents as a likely locus for discursive transformation; a location in which the seeds of discursive transformation might be sown.

Although in this context the transformation most clearly impacts the discourse of 'the city,' it plays out at the deeper levels of the historical-documental archive that contain the discourses 'the human' and 'the thing.' While it would be somewhat too reductionist to state that a city can be reduced to a set of human-thing compositions—the experience of a city is somehow greater than the sum of its parts—it is, I think, still logically valid to state that the city is made up of humans and things. It is simply that these humans and things interact in such richly heterogeneous ways that they give rise to emergence, the characteristics of which resemble the more nuanced aspects of 'the city.' (The Phi Phenomenon [Wertheimer, 1912, Dimmick, 1920; Wertheimer & Riezler, 1944] present in the seemingly moving marquee lights on The Biograph in Chicago, the nightclubs of McInerney's 'Bright Lights, Big City' [McInerney, 2014] the synchronicity of another driver's

[125] In reducing the human to 'the viewer,' one finds an interesting example of prosthesis: the human-as-viewer is not the whole human, but rather a construction of a certain, reductive human: a technical image born of technical images, wherein the holistic human is reduced to a subset of its perceptual modalities. In being so reduced, it is also reified as a 'type' of human created by the media with which it interacts. This type stands in for the human in much the same way that a wooden limb stood in for Captain Ahab's leg. Whether framed as an extension or a prosthetic, any media format—when considered from the perspective of 'use'—reifies the human user not as a human but as a prosthetic representation of a human.

turn signal with yours.) The city as discourse arises from a set of potential things, a heterogeneous set of affordances that arise simultaneously between multiple sets of subjects and objects.

In the video presented above, we have a set of potential things within a thing; a play within a play if you will; a set of potential futures resident in the combinatorial possibilities of the elements that make of a representation of a future. This effect, this composition, is breathlessly achieved through representation via moving images: the viewer has but to watch in order to gain the extra-human (extended-prosthetic) perspective of the video, a possible world contained in a window on a screen. In achieving this breathlessness of representation, I posit that video representation constitutes a non-scalar transformation: the differing physical scales of such discourses as the city, the home, and the body are all unified and de-scaled, through their translation into video. It's the world in a circus mirror. Video, by means of the communicative affordances that arise between the viewer and the viewed, becomes a scale unto itself: it transforms the physical scale of the world into an otherworldly scale collapsed and linearized within the boundaries of the frame and time. The visual representation of the human archive becomes a purely technical image. As such, I argue that video, or the moving image in general (and perhaps diagrams, whose function it is to create a non-scalar vantage point [Bender & Marrinan, 2010]) is *the mode* of presenting the manifold imaginaries of IoT. Because it is *the mode*, one is left to wonder if the human uttering the statement, 'I am human,' is anything more than a prosthetic reduction of itself: a human that is created through reduction and defined solely in terms of a divorced and dissected mode or subset of modes of perception and sensation.

To restate: the video is a thing. It is a representative thing that contains representations of other potential things. The thingness of these represented things—the affordances that arise between

subject and object to constitute a thing—are translated through the visual pathway, the visual characteristics of moving images. These moving images achieve subtle impacts on potential things they represent. For example, the tangible qualities of potential things cannot adequately be represented through moving image; nor can, say, olfactory or gustatory qualities of these potential things; nor can the Gestalt sum of multiple simultaneous perceptual simtuli, which ultimately add up to the experience of human embodiment at a given moment. The moving image simplifies as much as it expands. In this simplifying expansion, it creates a scale all its own. Because of the interactive qualities of moving images, things represented in such moving images can be none other than things represented by moving images: they are not the things of text; not the things of touch; not 'things' in-situ. The moving image as a means of representing potential futures becomes analogous to Foucault's notion of the clinical gaze: it is a way of seeing a particular part of the world that then becomes *the* way to see the world.

Beyond the qualities of moving image and their relevance to the representation of potential things, we must also take into consideration the vehicles of the moving image. Apparatuses are required to view moving images. These apparatuses, in bounding the experience of viewing the video, also bound the qualities of the potential things that are represented through the video.

Consider the act of viewing a video on a laptop. If I view the video via my laptop, then my auxiliary means of interacting with the video—if the primary means are found in my visual pathway—stem from the 'thingness' of the laptop, born of the affordances that inhabit the space between me (the subject) and the computer (the object). Through my use of the laptop as a viewing apparatus, I am primed to consider forms of interaction, forms of potential things, via the means of interaction I have with the computer. (It is not, then, appropriate to speak of a video in a vaccum, as there is no video without a means of presentation.) Some of these means of interaction jibe with

the most apparent characteristics of the potential things represented in the video: my laptop is essentially a mobile technology. I can view the video on my couch, in my office. I can take it with me wherever I go, which aligns well with the sense of ubiquity present in the video. On the other hand, the use of my laptop as a viewing apparatus perpetuates the marginalization of a great swath of human sensation and perception that gives rise to the human archive in its most unbounded form: relative to the laptop, I have but vision, audition, and touch. The world is reduced to these senses. If, as the video showed, IoT is to be pervasive at the level of the city, it is impossible state that any representation of potential things via video viewed on my laptop can be wholly representative of the world it will create—a world that, by virtue of being a human world, extends beyond three senses.

In order to further explore the relationship between the materiality of the moving image and the boundaries of what futures of IoT can be represented through them, I turn to examples of IoT in the home. These examples primarily consist of video materials released by Sony to promote their smart home techno-ecosystem. (Sony presents as a suitable corporate body from which to seek data because, unlike Intel, it is a recent entry into the IoT market. In this way, it is reasonable to expect interesting outcomes from a comparison between the two, assuming that there are suitable similar discursive constellations that subtend both Intel's and Sony's IoT imaginary.) Each of the Sony videos presents an IoT-based system and its functionality within more mundane situations, quieter moments: getting ready for bed and a family watching a movie at home.

Following these examples, I will also present the description and analyses of a diagram published in a 2004 issue of Scientific American as part of an introductory article about IoT written by Neil Gershenfeld, Raffi Krikorian, and Danny Cohen. (The article from which this diagram is plucked was discussed in Chapter Two through the lens of the term 'Internet-0'.) This diagram

constitutes a representation of a smart home, or IoT-enabled home and presents as a suitable analog to which we can productively compare the visions provided by Sony.

5.4.1 Sony Webpage

As was the case with the Intel video described in the previous chapter, the two video-scenarios produced by Sony (described presently) do not exist in a textual vacuum—nor do they exist in a vacuum of mediation. That is, they exist as part of a broader set of texts, a broader set of communicative objects that co-constitute the communication. The most apparent textual complement takes the form of the webpage that presents the videos; the most apparent object co-constituting this webpage is the laptop (or smartphone or tablet or smart television).

Notably, Sony does not explicitly identify 'Internet of Things' as the focal point of the page that houses the videos. Instead, the scenarios are presented under the umbrella term of 'Smart Home.' Such a lexical difference is not cause for concern: if the Intel video described earlier presented the Internet of Things at the scale of a city, it is not unreasonable to assume that such an imaginary has significant overlap with the semantic vector of 'Smart Cities.' The city, after all, is comprised in part of homes, condominiums, apartments, dwellings. We might, then, assume that Sony's 'Smart Home' examples comprise a complementary set of IoT devices or systems: a subset of locations in which a different, situation-specific imaginary of IoT might be found. Both networks are comprised of small computing devices embedded in everyday objects, each of which are rendered identifiable on The Internet and gather data of some form or another. Put differently, it seems valid, then, to infer that 'smart cities' and 'smart homes' constitute complementary vectors of the IoT imaginary.

When one navigates to Sony's smart home webpage (https://www.sony.com/regional/smart-home, accessed 09/10/2018), they are met by a rich visual of a contemporary, affluent living room. A black bar lines the top of the screen and, from left to right, contains the Sony logo and links that represent four categories within the consumer-facing side of Sony: "Electronics,' 'PlayStation,' 'Entertainment,' and 'Support.' At the right side of the screen, the viewer also has the option to 'sign in' or to select a heart icon (*click/tap* again) in order to view previously favorited Sony products. A dialog box for textual searches is also present next to a link that reads, 'Sony Sites,' which leads the user to a splash page containing various (largely redundant) links to other Sony webpages. Each of these features on the webpage indicate that the imagined Smart Home to which one is given access by way of video content exists as part of a greater media ecology, one that is constructed and bounded by the Sony Corporation and its myriad divisions.

In this way, and when viewed through the lens of corporate personhood, viewing the Sony webpage is not unlike viewing the profile page of a user on Facebook: while the Sony page does not itself contain much by way of archived mundane events or links to external bits of text, it is a type of profile nonetheless, perhaps subject to a temporality of the corporation rather than the individual. This, I argue, is a temporality characterized by outward-facing rhythms that ebb and flow at a pace much slower than that of the individual. In this light, the products presented in the various lines that Sony produces are as newsfeed posts. To interact with the Sony webpage is to interact with the Corporate Social presence of the corporation-as-person, the corporation-as-subject at the other (invisible) end of an IoT-enabled device.

Below the page's black navigation bar, the user is presented with the aforementioned image of a living room. A large white box fills part of the left third of the frame. It contains the words, 'A smarter home for a smarter life.' As was the case with the text presented in the Intel video, this

text is also a sans-serif, giving it an informal feel. It is, however, black (presumably to match with the black and white color scheme of the Sony brand.)

Beyond and around this text box, a grey, overstuffed and multi-sectional sofa is visible. The sections of the couch are strewn with pillows and blankets. A brown, wooden coffee table sits in front of the L-shape formed by the couch and chair. It holds a few *objets-d'arts* (two bowls, a pitcher, and three geometric sculptures of cubes, like hollow Rubik's Cubes) and a tablet. The tablet, black and shiny, occupies the center of the table. A floor lamp stands on tripod legs in the background, its white, cylindrical shade blends almost perfectly with the white walls of the room and the transparent, but largely opaque windows. The right third of the frame holds that newfound center of the household: the media center. A very large flatscreen television is hung on the wall. It displays an image of a sunset over a body of water. Beneath it, a sound bar speaker is also mounted on the wall. (An additional speaker sits on the floor to the right of the tripod floor lamp.) Beneath that, still, the viewer sees a small credenza with three shelves. The top shelf holds a small plant, a DVD player, two more *objets-des-arts*, and an analog clock. The clock appears to be made out of stone and has the shape of an old, tube-driven television set, with the hands occupying the space that would otherwise house the television screen. The shelf below contains two stacks of books, another geometric knick-knack, and three antique video cameras. The lowest shelf is full of still more books, stacked on their sides, spines blank.

Four circular icons emerge from the flatscreen on the wall. They are connected to the television by dotted lines. Each of the circles contain one icon. From left to right, these are: a thermostat, which looks uncannily like a speedometer; a television with the Netflix logo on it; a lightbulb; and one representing a set of Venetian blinds, which might otherwise be mistaken for a spreadsheet if not viewed in the greater context of the living room setting.

The user scrolls down the page—the only motion allow as a result of the webpage's format—to see two large company logos, preceded by the words: "Shop Online At." The logos are that of Amazon.com and Best Buy. Both logos has links below them that read, 'learn more.' The screen behind these logos is stark white, an open space.

Scrolling down further, a light grey box appears. It contains another text box, the image of a Logitech Harmony Hub (which looks rather like a wireless router), and an enlarged image of the flatscreen television found in the image of the living room. In this presentation, however, the image of a sunset over a pristine and shallow body of water is augmented by a row of square icons at the bottom of the screen. At the bottom left of the screen, the first of the icons is a menu icon: it reads 'Edit My Apps." Five other square icons are found next to this one, each of them comprised of light blue boxes, black boxes, white text, and simplified icons. From left to right, they are: 'Movie Night,' the text of which appears next to an icon of a television with a play button at the center; 'Blinds Closed,' which appears next to an icon of window blinds (interestingly not the same as the functionally similar icon seen in the picture of the living room—more on this later); Lights Dim,' which is paired with an icon of an Edison light bulb; 'Good Night,' which appears next to an icon of a bed with a crescent moon above it; and a Thermostat icon, only part of which is visible. Each of the square points of interaction contain the word 'Harmony' beneath the name of the application. The Harmony device that sits next to the exemplar television-app-interface is qualified with an asterisk: 'Logitech harmony Hub required / Sold separately.'

The text box to the left of the television sheds some further light on this asterisk. Its headline reads, 'Smart Home Automation.' Its body, as follows: "Beyond streaming content, Sony's Android (TM) TV platform [footnote 1] allows Home Automation control directly from the TV, via the Logitech Harmony Hub [footnote 2]. IoT (internet of things) devices such as lights,

thermostats, Blu-ray (TM) players, security cameras and other home entertainment devices can be controlled and automated via the push of a button on the TV's remote [footnotes 3 and 4].

Each of the footnotes sheds still further light onto what lies beneath the highly streamlined imaginary of apps and functionality reprinted by the set of application-icons on the TV screen. As they say, 'The devil is in the details.' Footnote 1 reads as follows:

> Requires compatible devices connected to the same network. Google Cast requires mobile devices with Android 2.3 or higher, or iOS 6.0 or higher and Chromecast application. Google Play using Android TV Remote Control application requires Android 4.0 or higher not available for iOS. Voice Search is available using the included remote control, Android TV Remote Control application with Android 4.0 or higher, or using Sony's TV SideView application available for Android 4.04 or higher of iOS 7.0 or higher. Footnote 2 indicates that the 'Logitech Harmony Hub [is] required [and is] Sold separately.

The third footnote, relative to controlling IoT devices from the TV remote, reads as follows: 'Requires all compatible devices connected to the same network. Refer to Logitech for details on compatible devices. Compatible IP cameras require direct connection to the TV via Wi-Fi. Features and specifications subject to change without notice.' Finally, the fourth footnote tells its reader that 'Screen images [are] simulated.' In this simulation, the coupling of an imagined interface with the realities of rapid software/application development and the rich ecology of often incompatible devices described in the footnotes, presents an imaginary of IoT not seen in the Intel video described in the last section. This simulation is one of real-time infrastructure.

Scrolling still further down the page, the viewer sees a heading: 'Control one device at a time / Dim the lights from the TV remote.' This heading is followed by an image of a married couple (the woman's wedding ring is visible) sitting on a grey couch like the one seen at the top of the page. They are both wearing neutral tones and appear to be in their early forties. The man, a white

man, has grey hair and fashionable eye glasses. His left-hand rests in his lap, his body leaning slightly towards his wife. He is wearing a nice pair of blue jeans—the sort you imagine to see in offices around Silicon Valley or that so frequently walk their way across TedTalk stages. He is at the fore of the image, his right arm wrapped around the shoulders of his wife. The woman, a black woman of roughly the same age, is wearing a cardigan, a white v-neck tee and a pair of pink slacks. She is holding the remote; she is in control (although the body language of the image is somewhat troublesome: the man seems to possess the woman by way of an arm wrapped around he body, while the woman seems in control of the household, given that the image appears directly under the heading of 'dim the lights.' Still, some credit should be given to the marketers, having chosen an interracial couple as their models—this is a far cry from the ubiquitously white figures that populate the Intel video.)

Below this image, another heading appears as the user scrolls: 'Control multiple devices at once / Movie night at the touch of a button [footnote 3].' Three images appear in a row below that headline. The first is the image of a posh living room, possibly the same living room presented above, but seen from a different angle. A large grey sectional couch sits in front of three tall windows, through which can be seen a well-furnished patio area. The blinds on the windows are partially drawn; the text below that describes the image reads, 'Lower the shades.' The middle image, which is accompanied by the text, 'Adjust the temperature,' displays a Nest thermostat set to 68 degrees on a wall next to the living room. A third image, at the far right of the screen, shows the same married couple lounging on their couch in front of the flatscreen television, which has the Netflix logo on it. (This image of the couple is the same as the image above, but taken from a different angle: the woman holds the remote, the man's right arm is wrapped around her. He is

smiling.) The text that accompanies this image reads, ‘Launch Netflix and dim the lights [footnote 5; footnote 4]. Footnote 5 tells the user that a ‘Netflix streaming membership [is] required’.

Finally, below these three images, another heading appears: ‘Personalize your entire experience / adjust your settings for any activity [footnote 3].’ This heading provides entree into the realm of scenarios, each of which will be described in detail presently. The scenarios, added to the website on April 19, 2016, are: ‘Have a good night every night;’ ‘Set the stage for movie nights;’ and ‘Call the plays on game day.’[126]

Aa promised above, the difference between the two icons that represent the window shades deserves close attention. In giving this discrepancy attention, it is my intention to further illustrate the extent to which the imaginary of IoT—or the imaginaries of IoT as it exists as various scales—is maintained and negotiated. That is, to foreground the idea that IoT is not yet concretized or stable. The discrepancy between the window shade icons allows the abduction of one or two causes: (1) that different groups of individuals within the Sony Corporation, or the Media firm contracted by Sony, were working on this representation and that there was not adequate communication between these teams, which resulted in this slight inconsistency; (2) that either the content on the webpage or the content in the videos were produced significantly before the other—that is, one of the two window blind icons was produced at a point in time sufficiently prior to the other as to belong to a different iconography, a different visual vocabulary of IoT icons.

In either case—and they are not necessarily mutually exclusive—we see evidence of a negotiation process, a process of maintenance that underlies the construction of any give imaginary of IoT. This small finding provides further support for the entirety of the project I am undertaking

[126] These video scenarios are no longer available for viewing on the Sony website. They are, however, archived at archive.org: https://web.archive.org/web/20170519071859/http://www.sony.com/regional/smart-home

here: it is not accurate to approach IoT as something that has concretized. One cannot speak of IoT in a critical or scholarly way in the same way that one might speak of a telegraph system, telephone lines, or railroads. IoT itself is an imaginary, an infrastructure that is waiting to be, that is becoming—every act of declarative description that remains insensitive to the transformations of IoT within those corporations and individuals who are responsible for its design, construction, and marketing/sale, is one that preemptively defines IoT in a reductive way. It is not here fully, but it is coming to be here.

Such preemptive reduction is problematic because it puts the cart before the horse: if we treat IoT as though it has already concretized in the form of a known and fully knowable entity, we risk creating a catastrophic theoretical gap between what is described and what actually exists—unless we are sensitive to the changing nature of IoT, the conflicts that exist even within a single corporation's representation of IoT, then we fall prey to a fundamental problem of external validity: what we seek to theorize is not what is present in the world, but rather present in our technical images of what is in the world. Given what is at stake in terms of what it might mean to be a human in the future worlds of IoT, I believe the reader will see the importance of this point.

Moreover, the discrepancy between the two window blind icons also hints at internal inconsistencies within the archives of IoT—archives not in the Foucauldian sense, but in the pre-Foucauldian sense of documents and inscribed substrates that give rise, through collection and maintenance, to the archive so passionately investigated by Foucault. In the difference one finds tentative evidence of transformation within the archive. This is not necessarily the type of transformation that Foucault described—the transformation of discourse that leads to a rupture in the continuity between ages—but it is possible that this difference plants the seeds for such transformation. If the archive is seen as a set of possible statements arising from the historical

record (i.e., the material and semantic contents of archives themselves), then I see no better way to begin looking for the mechanisms of discursive transformation than through the changes in the documents that comprise archives.

And so, with the materiality of archives and its relationship to the greater archive, which becomes visible not at a distance, but in the actions of everyday life—the mundane—within a received historical *a priori*, I direct the discussion to other artifacts found within Sony's archives of IoT: video representations.

5.4.2 Video: 'Set the Stage for Movie Night'

The frame is filled with black, the words 'Smart Home with Sony' appear in stark white. An electric guitar plays an arpeggiated chord in common time at a walking pace. As the harmonic content shifts, the words 'Movie Night' replace the original textual content. The camera pans out to reveal that the black color filling the frame was the blank screen of a wall-mounted flatscreen television within a home, a residential dwelling. As the camera continues to pan out to reveal more of the room centered around the TV, the words 'at the touch of a button' appear below 'Movie Night.' (See Figure 33.) The TV screen fills with a jubilant scene: neon lights line a wall in diagonals, a large, multicolored orb hangs from the ceiling above a crowd of revelers. They dance.

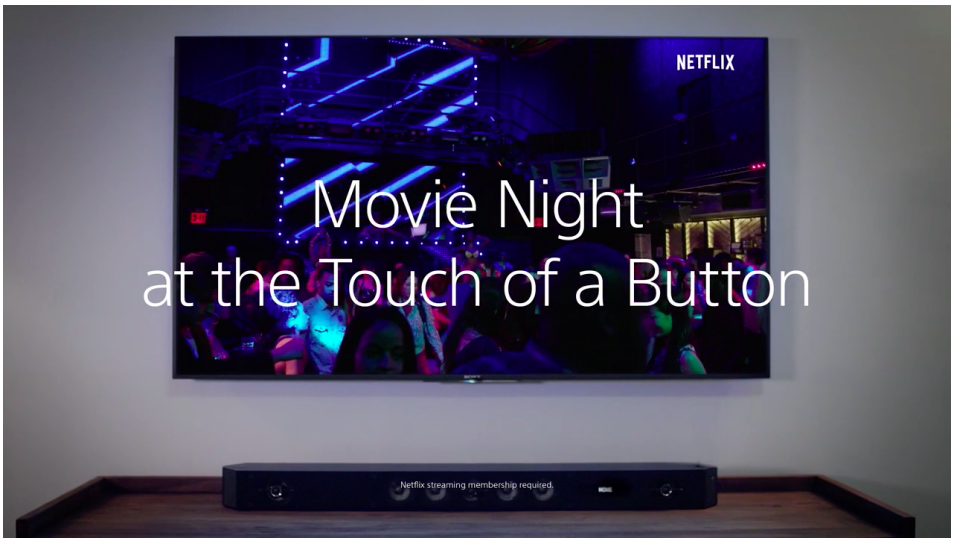

Figure 33. "Movie Night at the Touch of a Button."

The video cuts to an external shot of a suburban home. It's a brown brick ranch with white trim around the windows and roof. The sky above it is light blue with hints of pink: it is around sundown. (It is, after all, a short film entitled 'Movie Night'.) The grass in front is a greenish brown color: perhaps this is California in the summer. (See Figure 34.) A general sense of suburban relaxation pervades. The entry way to the house is found in the left third of the frame, but is obscured by the pillars of the porch. A long stretch of windows overlooking the front yard are the central focal point. They are open, and there is a hint of light emanating from them. The clouds in the sky, animated by time lapse, race towards the left side of the frame as the last hues of pink and blue fade from the sky. One almost expects to hear Joe Cocker's rendition of 'With a Little Help From My Friends,' and to see Winnie Cooper appear from the screen of *The Wonder Years*. It is a nostalgic scene for anyone who grew up in the great anonymous suburban stretches of the United States; another kind of nostalgia is present, too, as in the paintings of Norman Rockwell: a nostalgia for the perfect evening, of familial closeness, of crickets and cars pulling into the driveway to end various commutes. (Arguably all the more present in the form of spectrality of this was not the type of childhood the viewer had.)

Figure 34. A single-family, suburban setting.

Night has now fallen by way of time lapse. The frame cuts to a close up of the long stretch of windows. Inside the house, beyond the windows, the viewer sees a living room. (See Figure 35.) The porch light is on to the windows' left. The camera pans slowly to the right as two kids, early teenagers, race from another room into the living room. (Again, one is met with a prosthetic nostalgia—I do not remember such evenings in my own youth, when my brother and I were both teenagers.) Two adults, Mom and Dad, are already sitting on the couch. The scene is a wholesome one in which the viewer supplants a glossy fictionalization of home life for all of the grit and honesty of autobiography.

Figure 35. Medium external shot, night falls.

A smash cut reveals the interior of the house. (See Figures 36 and 37.) The camera faces the room from which the kids ran to the couch—it's the kitchen. There are framed photos on the wall, a gently cluttered kitchen table, and blankets on the couch. The camera pans around to the left to reveal the kids jumping onto the couch to join Mom and Dad. It is a cozy, but clean house. Various baubles populate the shelves, plants line the exposed brick wall behind the couch. The kids are dressed casually: the girl wears an open flannel-style shirt over a grey tee with blue jeans and nondescript sneakers; the boy wears a short-sleeve button-up shirt with brown corduroys. (This is a family that glows with a certain Americana—perhaps a Protestant work ethic; the kind of family that plays classic board games one night a week; the kind of family when Mom and Dad are never too tired to help with homework, and the kids don't complain about school.) The teenage boy jumps enthusiastically over the arm of the couch to sit next to Dad. The family is laughing and smiling. Dad extends his arm around his son; Mom reaches toward the coffee table as if to pick something up.

Figure 36. Kids run from the kitchen to the couch.

Figure 37. The family is joined on the couch.

Another cut reveals a close up of her hand grabbing a remote from the table. (See Figure 38.) This is, relative to the technological ecology being described, the first significant gesture. It is the point at which one of the human actants directly engages with the 'smartness' of the home. (To be *in* a smart home, it seems, is not the same as being engaged with the smart home. Some kind of interface is required. The remote, as we will see, constitutes that interface.) Text appears at the

bottom left of the frame: ‘Discover Button / One button launches multiple actions.’ The wooden coffee table, seen up close, sits empty. It is impeccably clean. Still another smash cut provides a close up of Mom’s hand pressing a button on the remote. (See Figure 39.) The remote is centered in the frame; the Discover Button text is still visible at the bottom left.

Figure 38. "Discover Button / One button launches multiple actions."

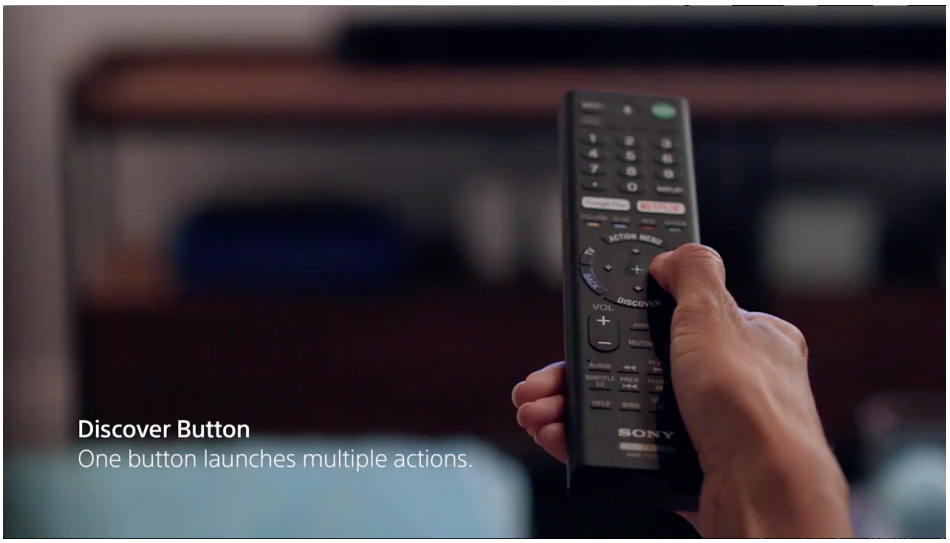

Figure 39. The press of a button.

The presence of the word ‘discover’ deserves some analysis. At first, it presents as mundane—it belongs to the language of smart TVs, to the language of a generation of applications and their users who, through interaction, expect to gain access into a universe of digital data, of digital content. But just what does it mean to ‘discover’ something within one’s home? I, for one, do not readily associate the act of discovery with the act of being at home. My association is quite the opposite, in fact: one cultivates one’s home, populating it with particular objects, particular experiences. To discover something within one’s home is to experience, perhaps, surprise in one’s home: one discovers an infestation; one discovers the cause of that smell in the kitchen; one discovers that something has been misplaced. One does not, I think, generally discover something new and enjoyable within the confines of a home that is so clearly well-lived in as the one that is presented in the Movie Night video.

In the term ‘discover’ one encounters a breakdown. Not a breakdown of functionality as in a power outage, but a breakdown of the insular nature of the home. Its walls become porous like the skin of the earth, like the human skin described in earlier chapters. The smart home, it seems, differs from a traditional home (an un-smart home) in that the ‘smart’ quality of the objects that co-comprise the smart home invite the world in: it is the world outside that is to be discovered (in some sense) by means of Mom’s remote control. The gesture of picking up the remote—arm extended, hand grasping, fingers pressing—is an act of exploration. The television becomes less a television with a set number of broadcast options, but a window more like that which one might find at the user-end of a computer’s operating system. In the smart home, the television (like the personal computer before it) becomes a member of an already residentially based metaphor: it becomes a window, but a window to nowhere and everywhere, to a limited but functionally

limitless number of scenes. A movie is just one genre of scene to which the gesture of picking up the remote control within a smart home gives rise.

Once Mom has pressed the ‘discover’ button, yet another smash cut reveals the flatscreen TV mounted on the wall at the center of the frame. (See Figure 40.) A sound bar sits on the media center below it. Some books are visible on the media center, as are some candles. (These are not the same objects seen populating the media center in the still image featured on the webpage.) There is a generic quality to the books: their spines display no descriptive information. They are simply books, generic stand-ins for a commonly understood category of objects. (The significance of this generic quality will become apparent in subsequent sections, but should resonate with the analysis of Benjamin’s ‘Note on Unpacking my Library’ [Benjamin, 1969].)

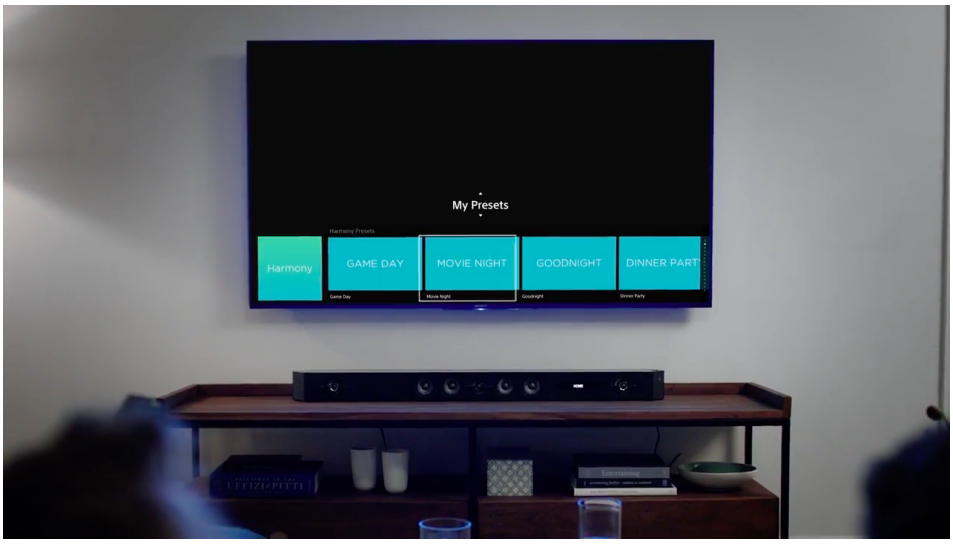

Figure 40. The media center.

Now that the TV screen has been activated by the depression of the ‘discover’ button, it is still largely black. A bit of white text, ‘My Presets’ sits at the center of the screen sandwiched by small up and down arrows atop and below. The bottom quarter of the screen is full of large blue boxes: points of interaction. The leftmost reads, ‘Harmony,’ likely as an indication of which device is

being controlled by the remote. To the right of this box, four others are seen: ‘Game Day,’ ‘Movie Night,’ ‘Goodnight,’ and ‘Dinner Party.’ Again, and in the cleanliness and generic quality of these categories, one is met with a certain faux nostalgia for the quietude and satisfaction of the ideal familial living situation where dinner parties are frequent and executed without a hitch; where the family gathers regularly to watch a film; where Dad and his friends gather to watch a Sunday game of Football, possibly inviting Junior to join in some American rite of passage. (Part of the smartness of a smart home, it seems, is stylization—smartness gives way to a homogeneity of actions in the same way that the ubiquity of kitchens or couches does.)

As the camera executes a gentle pan-out, three illustrated, curved lines emerge from the sides of TV screen. (See Figure 41.) A smash cut reveals this line to be a representation of information in the form of a command—these white lines, presented not as a series of straight lines with hard angles at endpoints, but rather with the naturalness of curves reminiscent of waves, is an extension of Mom’s gesture. It reaches a shiny black device that says ‘Harmony’ on it. (See Figure 42.) Notably, the Harmony Hub is located next to a book. This Harmony is about the size of a standard modem. It is what is known as a hub: a center for interaction that is itself not a center of tactile interaction. It is the obligatory passage point between the gesture of picking up a remote control and depressing one of the buttons, and the execution of certain system commands. That it is essentially an object with which the user has limited direct physical interaction is important: the Harmony exists as a sort of black box.

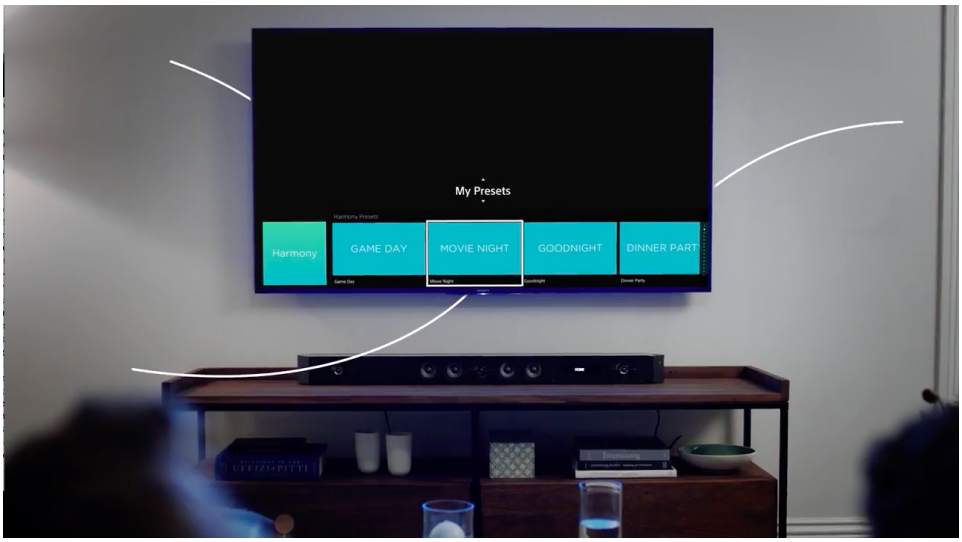

Figure 41. Visualizing invisible connectivity.

Figure 42. Harmony Hub next to a book (partially visible at upper right).

The line splits in two and encompasses, outlines the Harmony device briefly. It then shoots quickly to the upper right quadrant of the frame, setting up the motion that will lead to the next cut. A close up of Mom's hand shows her placing the remote control back on the coffee table. Her work is done, the gesture complete. (See Figure 43.)

Figure 43. The completion of the task.

The frame then reveals the illustrated, curved line reaching the popcorn maker on the kitchen counter. (It's worth noting that the popcorn maker resembles the once-quaint heated-air models that predated the rise of the microwave in the 1980s—given that it is able to receive a signal from the Harmony Hub, this is clearly a new popcorn maker. A fine example of skeuomorphic design and a rhetorical device intended, I argue, to blend the novelty of the 'smart home' with the comfortability of the home as it has been known in recent memory.) (See Figure 44.) The skeuomorphic design of the popcorn maker, as well as its feature within the film, constitutes a device of enrollment—it indicates to the viewer that the hopefulness of the 'smart home' is not so hopeful as to grant it status as a monster. If there be sea monsters here in the uncharted reaches of the sociotechnical, they are not scaly, but perhaps stuffed as in a child's toy.) The popcorn maker sits between two bowls. The kitchen counter, as with the living room's coffee table, is pristine, free from the clutter of snail mail, of pens and notepads. Free, even, from any signs of meal preparation.

Figure 44. Skeuomorphic popcorn maker.

White text fills the left third of the screen. It is bullet-pointed and reveals the narrative arc of the film's remaining contents: 'Movie Night / Start popcorn / Theater lighting / Close blinds / Raise temperature / Launch Netflix / Adjust sound.' In a series of cuts, the viewer follows the animated curved line to its various destinations. A chandelier dims, an external shot of the house reveals shades descending. The Nest Thermometer is raised from sixty-six degrees to sixty-eight. (Perhaps the family keeps the house so cold to keep all of the tech from overheating?) Netflix activates on the television screen to reveal a scene from the Netflix series, 'The Unbreakable Kimmy Schmidt'—an interesting detail given that it is not strictly a movie, nor does 'movie night' therefore entail watching a movie. (See Figure 45.) It is interesting, too, in that the presence of the Netflix brand performs a similar function to that of the skeuomorphic popcorn maker: it provides a taste of the familiar, but a taste that is seasoned with greater depth, greater possibility. The animated white line finds the sound bar speaker and the volume increases from 26 to 47. (Some like it loud.)

Figure 45. Launch Netflix.

The gesture that began with Mom's finger on the remote has now ended with the performance of preparation, the conditioning of the house for a pre-defined ideal 'movie night.' The camera cuts to a close up of the four members of the family sitting together on the couch. They are bathed in the TV's blue tint. Dad and son are smiling; Mom hugs her daughter, whose attention is rapt. Another cut takes us into the kitchen, in which the lights turn on and Mom walks in to pick up the popcorn already in a bowl. She smiles a smile of satisfaction—not wholly divorced from the gender roles portrayed in early home computing advertisements where Dad uses the computer to conduct business, and Mom uses the computer to maintain her grocery list and balance the check book—and walks past a fruit bowl sitting on the island countertop toward the left side of the frame. A close up of the popcorn, now held by Mom on the couch, pans out to reveal everyone digging in—sharing a bowl, as Mom points out something on the screen. A cut to a close-up of Mom and daughter, excludes the son and Dad. Mom playfully pretends to snatch popcorn from her daughter's hand. A subsequent close-up of Dad reveals him smiling.

The smart home as depicted via this movie night scenario is not one of cold technology, or even one of highlighted efficiency. Rather, the smartness of the home is presented as a service that

heightens the enjoyability (in some way) of time spent together as a family. It is not the smartness of 2001's HAL who prescribes action, or even the smartness of The Jetsons' Rosie who, slave-like and perpetually perplexed, performs routine acts of maintenance on the house. Instead it is a benevolent and invisible smartness—its visibility, after all, is only effected by the addition of the curved white line in the video. This smartness, this choreography of electronic commands executed by various servos and seniors attached (presumably) to the drapery, the television, the popcorn maker, and whatever else might exist off-screen, is a benevolent one. But such benevolence must be purely rhetorical: the family (most clearly Mom, given that it is her gesture that direct the dance) couples with the intertwined network of IoT-enabled devices so as to comprise a 'thing.' This 'thing' is a thing called 'movie night,' which would previously, in the absence of IoT-enabled technologies, not have achieved the Gestalt-like wholeness of a single action, but would rather have appeared as a number of smaller, separate actions—separate things.

A final cut reveals a medium-shot of the living room from behind the vantage of the family. (See Figure 46.) They sit close together in the muted light of their living room, Netflix playing a show on the flatscreen, water glasses on the coffee table. The words, 'Movie Night at the Touch of a Button' are overlaid on top of the image. The image fades to black; the text remains. A dissolve leaves the frame completely black for a moment before the Sony logo appears.

Figure 46. The culmination of Move Night.

There is much to be said by way of analysis about this video. However, there are further videos which when considered alongside this particular scenario will provide a richer, more detailed sense of the imaginary of IoT as it resides within the cultural and sociotechnical practices and semantics of the 'home.' The next such video that will be discussed portrays a woman's evening routine as executed within the context of a smart home.

5.4.3 Video: 'A Good Night Every Night'

This video, too, opens on a black screen. White words, 'Smart Home with Sony' appear at the center of the frame. The camera pans out, the blackness of the screen is again revealed to be that of a blank television screen. (One begins to see the primacy, the centrality of the television in this particular vision of IoT.) A television show, the Netflix series 'Master of None,' fades onto the screen. The Netflix logo is seen in the upper right corner of the television screen, as a new set of text appears at the center of the frame: 'Goodnight / at the Touch of a Button.' (See Figure 47.) It

would seem, too, that corporate dealings and alliances play an important role in maintaining the imaginary or imaginaries resident within the term ‘IoT.’

Figure 47. "Goodnight at the Touch of a Button".

This film begins in much the same way as the ‘Movie Night’ film. The camera cuts to an external, medium shot of a house. It is a two-story, grey brick house with white windows. The house is set on a hill, the lawn green. Time lapse reveals a shift from daylight to nighttime as the clouds, again, rush from right to left. Lights turn on inside the house. The focus is on the second story. It would seem, in the words of John Fogerty and countless other 1970s singers, that ‘nighttime is the right time’ for IoT.

A cut to an internal shot reveals a woman walking from a dark room or hallway into a bedroom. (See Figure 48.) She is wearing a salmon colored top and beige pants. She is comfortable, as if in pajamas, but it’s a far cry from the t-shirt and sweatpants one might assume to be more common. As she crosses the threshold of the room, her blank expression slowly changes to a gentle smile. She looks towards the bed as she smiles.

Figure 48. A smile before sleep.

The curtains are partly open, a bedside light already turned on—Mom is returning to the bedroom, or perhaps the lights were activated by some post-'movie night' protocol. She walks around the edge of the bed, its grey sheets, white duvet, and numerous pillows, as the camera follows her. A cut reveals her sitting down on the edge of the bed with a remote in her hand. (See Figure 49.) She is notably alone, but she is smiling and has been since she entered the room. (She seems excited to sleep, but not in a way that betrays the exhaustion of a long day—rather, her excitement takes the form of a woman of leisure whose day has passed uneventfully, but pleasantly, and whose tomorrow promises more of the same.)

Figure 49. Remote in-hand.

Raising her arm, she points the remote at the television on the wall opposite the bed: the gesture is repeated. It appears as central to interaction with the IoT-enabled devices that populate a smart home. As she raises the remote further to press a button, executing the full arc of her motion, the camera angle changes to focus on her face and the remote. (See Figure 50.) It looks back at her from near then end of the control. The perspective is the remote's: the remote control, through this perspective, gains ontological similarity with Mom. It has a perspective unto itself. The viewer sees the scene not through Mom's eyes, but temporarily through the eye of the remote's business end from which signals emanate. The subject and the object (the mother and the control) couple to form a thing, and the mutual composition of this 'thing' is highlighted through the bestowal of a defined perspective on the remote itself. Text appears at the bottom left of the frame: 'Discover Button / One button launches multiple actions.' Mom's gaze moves from the remote to the television, and a cut reveals the television at the center of the frame.

Figure 50. Remote, front and center.

In the next frame, the viewer sees a row of application icons below the ongoing television show playing on the screen. (The Netflix logo is still visible, and a thin line of text has appeared below the television: 'Netflix streaming membership required.') A white box, an indicator of the remote control's reach, highlights an app called 'GOODNIGHT.' A clock below the tv reads 10:20pm. (This is, again, a nod to the stylized and idealized fictions present in this and the 'Movie Night' films: I do not recall my parents, having tweens in the house, retiring to bed as early as 10:20pm…) The 'GOODNGIHT' app is selected and white, curved lines emanates from three sides of the screen. (See Figure 51.) As was the case in the Move Night scenario, one of the curved lines travels to the Harmony Hub located somewhere in the room. (See Figure 52.) Once again, the Harmony Hub is located directly next to books. It encircles the hub and moves onward to the upper left corner of the frame.

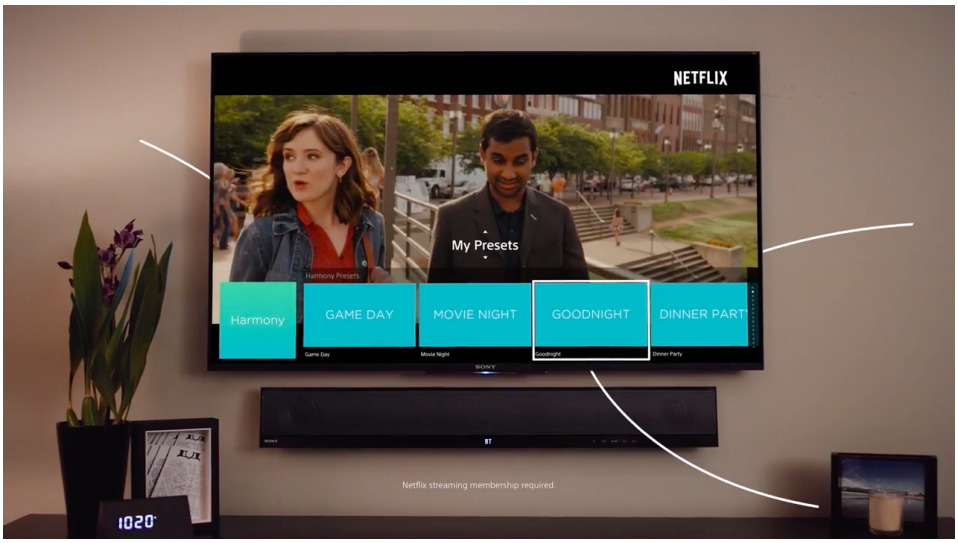

Figure 51. Illustrating invisible connectivity (again).

Figure 52. Another Harmony Hub, another set of books without titles.

A cut reveals a medium shot of the bedroom. Bullet-pointed text again appears at the upper left of the screen: 'Goodnight / Close Blinds / Adjust Temperature / Dim Entrance Lighting / Turn off TV / Turn Off Bedroom Lights.' A cut that reveals the act of 'Dim Entrance Lighting' is particularly revealing: it alludes to the ostensible homogeneity of rooms in Sony's vision of the smart home. (See Figure 53.) Smaller text appears at the bottom left of the frame: 'Netflix

streaming membership required. / Certain features may require purchase of additional accessories and services. / Go to sony.com/smarthome for details.' In a series of cuts, the camera shows blinds being drawn over the bedroom window, a nest thermostat being lowered from a setting of seventy degrees to a setting of sixty-five degrees. The entryway light in the living room is dimmed, almost turned off. Another shot shows the television show disappear from the TV screen in the bedroom.

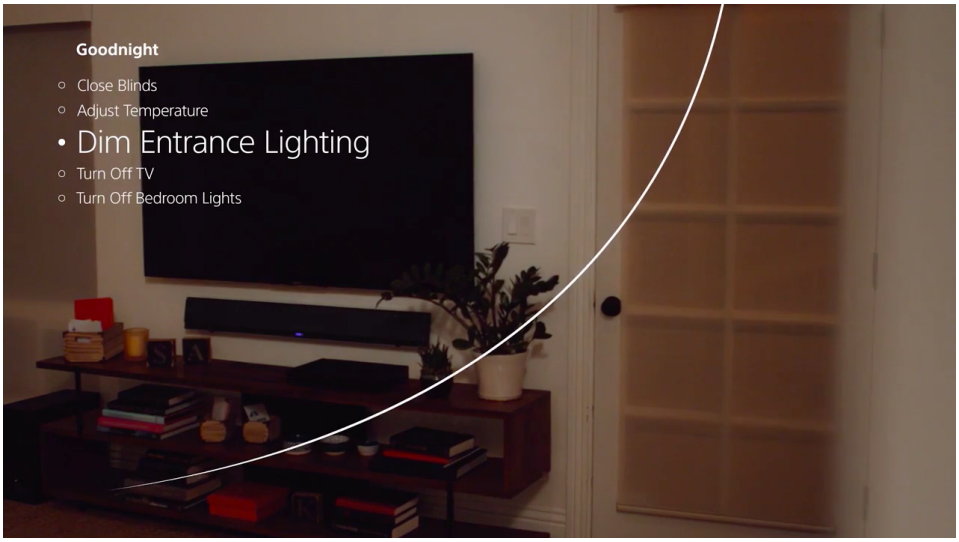

Figure 53. Object compositions in the Sony Smart Home.

The woman gets into bed enthusiastically, still smiling and with enough motion to bounce slightly on the mattress. As she pulls a white duvet over her body and maneuvers onto her side, the bedroom lights turn off. (See Figure 54.) This evidences a sort of formalized choreography. The woman getting into bed is doing so in terms of the rhythm of the operations she triggered at the touch of a button. Her actions are part of the networked actions. A close shot of her face reveals that she is still smiling as she adjusts her shoulders. A medium shot reveals a dark room, with only the woman's face and a portion of the duvet visible. White text appears at the center of the screen: 'Goodnight at the Touch of a Button.' The screen fades to black, and the Sony logo appears.

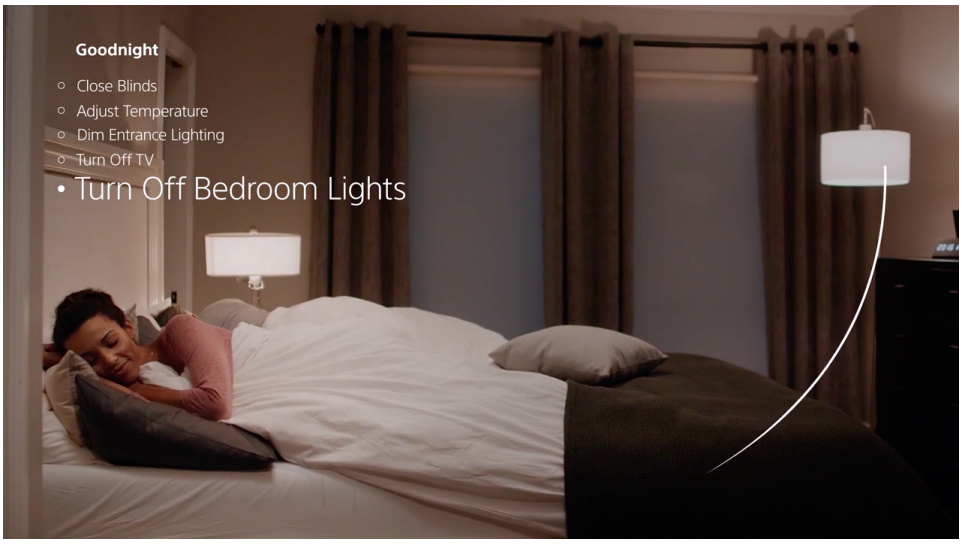

Figure 54. Part of the dance.

5.4.5 One Network to Connect Them All: Cities, Homes, Bodies, Systems

In the previous subsections dealing with IoT in the home, I have focused on contemporary representations. But the technologically sophisticated home is not a concept that emerged with IoT. It has been around for quite some time. (Archeological anthropologists might make the case for running water and sewer connectivity, in-home stoves and fireplaces, or indeed the home as a technology unto itself—and I think they would be correct.) Interesting though such a case would be—and relevant, too—I will limit discussions of pre-IoT 'smart homes' to eras in which the concept of a 'smart home' is not entirely foreign. That is, I will limit my discussions to the intersection of technology and the home to a time when 'technology' has as its most prominent referent 'computerization.' In this way I hope to avoid what might be seen as unreasonable retrodiction: I will focus on the latter half of the 20th century. More specifically, I will focus on the extent to which representations of the 'smart home,' predicated on the technology of computerization, tend towards standardization: a technological homogeneity that is so simplistic and streamlined in its representation as to be overly complex in its implementation.

Looking at the past from the present, it seems somewhat odd to come across visions of proto-IoT that are predicated on standardization. By this, I do not mean the form of standardization into which we, users, are naturalized after-the-fact: standards that appear as natural, comprising the historical *a priori* into which and through which we carry out our lives. Of course our technologies—our cars, our watches, our power grids, our homes—function as a result of standardization. (If you've ever tried to plug anything but an electric razor into one of those razor-only sockets in France or the UK, then you'll know this as well as I do. Hint: it ends in sparks, a dead gadget, a very unpleasant smell, and a bemused landlord.) But to look into a past wherein a means of standardization is proposed is nonetheless jarring. As though through ego (possibly to the point of hubris) the designer looks at the world as simplifies, controls: divides time into pre- and post-standardization as though such a bifurcation could be clean cut. Often, as with the case of overpasses, they are blind to the wicked problems such deep design cuts might have. Such clean and hopeful bifurcation runs directly contrary to the inherent heterogeneity of objects, to the artifactual richness of the technological ecology in which we now live. In so running, it paints a childlike reductionist view of the future in which we now reside. (It was only recently that I was able to stream Amazon Prime videos through my outdated Apple TV model, and the technological standards for this functionality are not new—the two companies just don't play well together, vying as they are for greater market share in increasingly overlapping markets.) Yet these predictions, these hopeful visions of a simple and easy IoT (or what we would now call IoT) exist. In their existence, they provide a perspicuous opportunity to interpret how visions of IoT—its structure and materiality—evolves and mutates—transforms—over time.

But it is not their mere existence that interests me here, or rather serves as primary focal point. Rather it is the way in which these visions of standardization are represented, communicated to

would-be- or non-believers. That is, the way in which representations of envisioned standards—their physical instantiations—speak to non-users and interested parties so as to effect enrollment into a particular vision of IoT. It is worth restating that enrollment into IoT—or proto-IoT—is not simply a question of getting people to buy networked gadgets. It is deeper than that, its depth stemming from its relationship to the human drive to classify and categorize and the extent to which an ontology that encompasses IoT, or perhaps has IoT as its armature, necessitates fundamental reclassification of subjects and objects, of the visible and the invisible.

5.4.6 Returning to a 'System of systems' via the Smart Home

In 2004 Neil Gershenfield, Raffi Krikorian, and Danny Cohen published an article in Scientific American (Gershenfeld et al., 2004). The article is aptly titled 'The Internet of Things.' Met with such a title, the reader expects a sort of manifesto or clear claim as to the nature and future of IoT. Similarly, given its authorship, those in-the-know might expect a cultural-historical effect similar to that experienced when Moses came down from the mountain: a prophet proclaiming the new status quo. ('This is IoT,' he said as the skies cleared despite subtle thunder and the crowd fell silent even as worshippers of false idols, visible power cords, and paper products were cast in shadow then consumed by the flames of the savvy.) This new status quo, this vision of the future, is termed 'Internet-0'. In a previous chapter, I have already discussed the diversity of signifiers that point to what is more broadly referred to as IoT: Internet-0 can be interpreted as just another addition to that population. It is specific enough to warrant its own definition, but in its specificity, it lacks the ability to adequately refer to what has actually emerged from and through the term 'IoT.' That is, in the roughly fifteen years since it was coined, 'Internet-0' already exists as a sort of linguistic vestigial tail (or tale). The idea of connectivity upon which it is predicated remains

deeply present in the imaginary of IoT that has emerged, but the simplicity of its proposed standardizations remains elusive.

Simply put, Internet-0 refers to a seven-fold strategy for internetworking heterogeneous devices. But I will not focus on the particulars of layers in this standardization cake. The specifics of these faceted strategies are not the focus here: instead, the focus is the regimented and highly structured appearance that representations of Internet-0 take—like the unexpected appearance of right angles in nature. That '0' is used in the term's construction—as opposed to, say, 2, which would more clearly indicate its temporal relationship to the unmarked category of Internet-1, or The Internet—highlights its conceptual place in the superstructure of the Internet. The concept of Internet-0 defines itself as a sort of taxonomic precursor to The Internet: to it is transferred the 'always already' status of objects—ontologically extant before, after, and around The Internet—such that the connectivity of The Internet is seen to seep, like water into soil, below the historical surface of The Internet into those material-object ecologies that gave rise to it.

Let's put this differently through a rough analogy: let's say that The Internet as we know it is a plant. The seed having been planted in the middle of the archive of the twentieth century, but having been slowly evolved, engineered over the centuries prior, it grows above the soil. We see its anatomy in the form of laptops, desktops, windows, endless email, junkmail, spam, conference come-ons, editorial requests, daily roundups, blasts (blastula?) and social media; we even rely on the specters of the visible, the present but unseen of wi-fi and connectivity. All this occurs above the soil and forms the anatomy of the plant; those less visible, spectral aspects forming its physiology. We, too, assume that there is a root structure. One might liken this root structure to the buried wires, the standards and protocols, the stacks and the clouds that allow the plant to grow. But in defining a future of IoT by means of the term 'Internet-0' it is as though the plant reaches

into the soil and changes it beyond its traditional effects of mineral exchange. It changes the soil into something categorically different: the presence of the plant (The Internet) transforms the bits of the soil, its grains and globs, into individual entities construed not in terms of itself, but in terms of its relation to the plant. The plant colonizes retroactively, defining and containing that which formerly defined it and contained it. To borrow a term from Geoffrey Bowker, an infrastructural inversion lurks in language of Interent-0: the soil is no longer the context for the plant; the plant is the context for the soil. Ground and figure are inverted. When IoT is envisioned as something that exists below or hierarchically prior to The Internet—as is the case in the 'always already' assumption of the connectivity of objects—The Internet claims a greater portion of that which is ontologically available: it claims not only that which it begets, but that which begat it.

Taken to its logical conclusion, the effects of this analogy indicate that the Internet of Things seeks to colonize the category of the human just as much as the plant colonized the category of soil, and indeed created that category. If 'things' are comprised of gatherings, couplings of subjects and objects, then the extension of the internet into the realm of 'things' necessarily implies the colonization of the human. The Internet in IoT recategorizes the human where the human exists as the subject in the composition of the 'thing.'

Following discussion of various architectural techniques—a discussion that aims to ground Internet-0 in infrastructure and aesthetics—the article contains an interesting graphical representation of how IoT would play out in a home. In the illustration, IoT comes to claim, to colonize, the world that gave rise to it: it inserts itself much like a parasite into the tissues of its host, thus redefining the host as part of a colony. The graphic is presented below. (See Figure 55.)

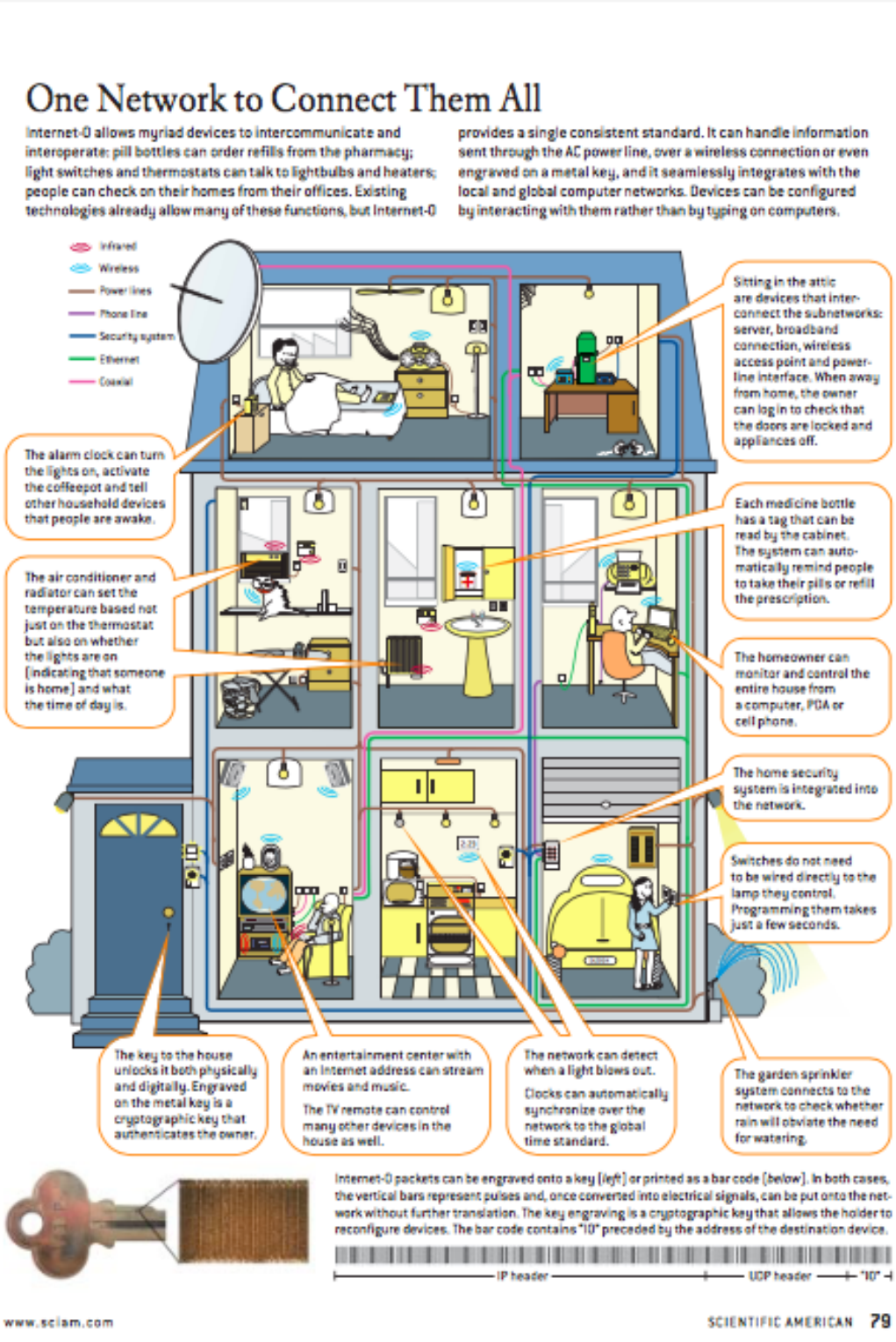

Figure 55. One network to connect them all.

Before analyzing the graphical content of this diagram, it is worth discussing its title: 'One network to connect them all.' This title imbues the diagram with some little historicity. We would do well to recall that the early 2000s saw the release of the major Hollywood productions of J.R.R. Tolkien's Lord of the Rings trilogy. Advertisements for this movie trilogy were inescapable at the time: commercials, billboards, the sides of buses and park benches. The tagline, 'One ring to rule them all,' was well known. In borrowing from this tagline—itself a line from the subtending mythology of Tolkien's Middle Earth—it is an attention grab intended to situate the dyad of reader and diagram within the greater socio-cultural ecology of the time. Moreover, its borrowing from the notion of 'one ring to rule them all' positions the diagram at the nexus of the fantastic and the real, simultaneously imbuing the network and its connectivity with the fantastical power of 'the ring.' It also speaks to the pervasive aspirations underlying IoT—it will connect everything, as though connectivity (like the ring) is the answer to any question of a better world free of the evils of Sauron.

The title primes the reader or interpreter of the diagram to understand its contents as something not unlike the books or films themselves: passage points between the material world in which we live and films are viewed, books read, and the realm of fantastic vision, imagination. (It also might be said to prime the reader to think beyond written text, such that they are tacitly aware of the communicative value of non-print formats even as they read a magazine.) As with the plant analogy above and, indeed, Tolkien's trilogy, this diagram reaches into a past that is known and redefines it through amendment. Oxfordshire becomes 'the shire,' the home becomes 'the smart home.' This is a reimagining, a riff on what we know colored by what we imagine. (This is the spectral characteristic of the symbolic-real.) It is a static and diagrammatic glimpse into the imaginary of IoT as it existed for a fleeting moment in the early 2000s. Its diagrammatic qualities

construct the representation as a perspicuous example of the sort of fractal history for which I am arguing: the inverse of the *longue durée* in which moments of time—bounded by the short-term lives of interpreters—contain the potentials for history at the scope of the *longue durée*.

The house, sitting just below the colonial title, represented in this diagram is not notable in its construction. Or rather, it is notable for its innocuous appearance. It might well be found anywhere from Southern California to Western New York, or Indiana: the 'little pink houses for you and me' somewhere along the side of a radio-highway. Its generic structure, too, can be interpreted as a rhetorical device of enrollment: one sees in its nondescript generic quality the ways in which it might apply to my home, your home, their home. It's a basic compound geometric structure (three quadrangles) divided by walls and bisected such that the viewer can see inside. Further inspection, however, reveals this visual rhetoric to be more complex than it seems: precisely because of its generic qualities, it can be compared to any home, every home.

The house rendered through a standardized graphic (all of the rooms on the first two floors are the same size sitting inside a perfect square) is intended to be 'seen through.' In its innocuous appearance it is not its own focal point, but rather a diagrammatic lens through which the viewer is intended to view their own abode—abodes being a prototypical category (Rosch, 1999) into which any number of unique living spaces might fit. That this diagram is in fact a *diagram* and not intended as its own focal point is apparent through the spatial divisions within the structure: all rooms on the first two floors are equal in size. This, in and of itself, is not problematic but for the contents of the rooms. While it is possible to envision a house comprised of roughly equally sized bedrooms, etc., (I think of the house my mother grew up in somewhere in New Chicago, Indiana), such a vision becomes practically problematic when the bathroom is considered alongside the garage. I don't know about yours, but my car certainly wouldn't fit in my bathroom, and I've never

seen a bathroom the size of a garage save for the rarified glimpses of how the other half lives on television.

So, this is the first give away: something beyond a 'house' is being represented here. The house is not 'my/your/our/their house' but 'a house.' It is indefinite. In its indefiniteness it is comparable to, and representative of, the whole category 'abode.' It has as its referent not any one house, or even the house that is depicted here, but rather the category 'residence.' (Note that we have yet to make the shift from *house* to *home*.) It is a signifier that points to a conceptual category rather than any physical manifestation related to that category. Put differently: in its applicability to any house, every house, the diagram is not a signifier of any particular home *per se*, but of the category of objects that contains 'house.'

As I will demonstrate, this category is painted in a paradoxical light: it is at once mechanically, structurally *of the human* but largely absent of those cultural intangibles that make the human 'human.' The house presents as a corpse, a body, but one devoid of animus or soul. This house is not a home. In the spectral presence of the soul's absence we see another example of an imaginary of IoT that divorces human experience (humanism and the celebration of the human) from a future defined by rampant connectivity as prosthetic-sensorial data. The imaginary of IoT is presented through the diagram as a purely technological one absent the human acts and experiences to which IoT is ostensibly in service (e.g., convenience, enjoyment, efficiency).

In its diagrammatic qualities, the rendering of a residence opens itself to an unusually broad realm of interpretation. The implied perspectival shifts of the diagram evoke the notion of a system, and systems are always comparable: they are things of functionality, where functionality constitutes the conceptual pivot point that allows for comparison. The comparability of systems contributes to the openness of the work—the broad range of referents that resonate within the walls

of the adobe. When this diagram is interpreted alongside the tripartite taxonomy of IoT situations presented in the video by Intel and discussed above, a particular sort of flattening can be observed. This is a taxonomic flattening, an ontological flattening that both expands and condenses broad categories of categories: the house become a connected system; the city becomes a connected system; the body, too. In this light, the taxonomies that historically serve to separate such objects as cities, houses, and bodies based on their particularities and idiosyncrasies collapse. They collapse by way of IoT and the connectivity presents at its conceptual center: the house, the city, and the body cease to be functionally and wholly separate and are redefined—recategorized—by virtue of the connectivity that binds each of their constituent parts.

This flattening is not complete or permanent. Rather, it is transient, seen from a certain vantage just as the traditional taxonomic separations extant between house, city, and body are perceptible from certain vantages. The ontological flattening (Sousanis, 2015) that is effected by IoT occurs as just one of manifold transformations: just as a plane can be morphed into a toroid by way of topological transformations, so too, it seems, can the ontology which houses both the signifiers and referents (the signs in total) of houses, bodies, and cities.

One might, for the purpose of illustration, approach the ontological flattening that occurs by way of IoT and its connectivity as a single facet belonging to a naturally multi-faceted object as, say, in the work of Ranganathan (Ranganathan & Gopinath, 2006). In this way—through the simple diagram presented above—we begin to see glances of the n-sided subject-object dyads that arise as a result of IoT, where one object can couple with one subject to construct potentially myriad 'things.' When the dyads are seen in this light—again with focus on the coupling between subjects and objects that gives rise to things, the thing-as-connection—the structure of a traditional ontology that separates cities from homes from bodies flattens out: each of these concepts in being

inherently possessed of potential subject-object couplings belongs to the same category. They are all potentially 'things.' As was seen above in the discussion of Intel's IoT video, this flattening is represented through graphical similarities between otherwise heterogeneous subjects and objects.

Without fully or permanently divorcing the 'smart home' from the more traditional category 'house'—as in retrodiction or the production of a retronym—it is possible to approach the home in Figure x as a system. Actually, it is not only possible to do so but appropriate given the refrain 'system of systems' present in Intel's definition of IoT as presented in the first section of this chapter. A system can be broadly defined, in the words of the late systems theorist Donella Meadows, as "a set of elements or parts that is coherently organized and interconnected in a pattern or structure that produces a characteristic set of behaviors, often classified as its 'function' or 'purpose'" (Meadows, 2008, p.188). On the same page, Meadows goes on to bullet-point several key characteristics of systems, which I present as sentences here: 'A system is more than the sum of its parts. Many of the interconnections in systems operate through the flow of information. The least obvious part of the system, its function or purpose, is often the most crucial determinant of the system's behavior. System structure is the source of system behavior. System behavior reveals itself as a series of events over time.'

I am not only interested in leveraging the more technical aspects this definition of a system to analyze the prototypical home presented in Figure 55, but also in exploring the brief flicker of humanism that presents in Meadows's third bullet point: "The least obvious part of the system, its function or purpose, is often the most crucial determinant of the system's behavior." The sentence's grammar is unfortunately unclear: this is one of the scenarios where an Oxford comma would be useful. In its absence, however, it is possible to read 'its function or purpose' as a clarifying appositive. I do not think this is the intended reading: in the primary definition provided,

Meadows notes that the primary set of behaviors (also referred to as the system's function or purpose) is what is produced by a system. Even accounting for emergent properties of systems, it hardly seems reasonable to state that a system's primary effect is the least obvious part of the system. So, we are left with an alternate reading of her statement, akin to where an Oxford comma had been used: system, function, and purpose then appear as a series and are impacted by some least obvious part. To my mind, this is the only reading that makes sense, particularly given the rhetorical value of 'least obvious'—there is a subtle mysticism in that line, something close to the human tendency toward heuristics and superstition. ('Where did I leave my keys?' / 'They're probably in the last place you'd look!')

I argue that this assessment is a deeply human one: it is an act of interpretation, a hint at the relationship between a system and a text as being read objects. It is worth noting that texts are not far from systems, particularly in the approach taken by D.F McKenzie in his Bibliography and the Sociology of Texts:

> I define verbal, visual, oral, and numeric data, in the form of maps, prints, and music, or archives of recorded sound, of films, videos, and any computer-stored information, everything in fact from epigraphy to the latest forms of discography [… Text] of course derives from the Latin *texere,* 'to weave' and therefore refers, not to any specific material as such, but to its woven state, the web or texture of the materials (McKenzie,1986, p. 13).

As such, systems are interpretable objects having (ostensibly) qualitatively defined 'least obvious' parts—any quantitatively defined state of 'least obvious' would require a purely objective view, or in the words of Donna Haraway, a god trick (D. Haraway, 1988). The invocation of this trick, its use and exploitation, is simply not productive in considering IoT—or any transient category of IoT objects that might arise.

To invoke the god trick is to fail to do meaningful analysis of IoT in the face of a research body already overburdened with constructed-objectivism. To analyze a system of objects within the greater transformable set of potential IoT objects must involve leaning into the subtle human-mysticism of Meadows' definition, the interpretivism to which it alludes. Put differently, the analysis of systems within IoT must take into account the human as actant within that system (actor-network?) not merely as a thinly operationalized possessor of tapping fingers, scannable eyes, and countable steps, but as that least obvious part of the system: a person in the mundane world slogging through the flu, trying not to make eye contact on the bus, or helping a blind man cross the street in a Pennsylvania thunder storm. In the case of IoT, systems analysis must be the analysis of a system as a human phenomenon.

Lines found in Albert Camus' 'Myth of Sisyphus' will shed further light on the potential analytical value of this approach. In the essay (the primary objective of which was to introduce and outline the concept of absurdity within the greater discourse of existentialism), Camus writes:

> At any street corner, the feeling of absurdity can strike any man in the face. As it is, in its distressing nudity, its light without effulgence, it is elusive. But that very difficulty deserves reflection. It is probably true that a man remains forever unknown to us and that there is in him something irreducible that escapes us. But practically I know men and recognize them by their behavior, by the totality of their deeds […] (Camus, 2012).

For Camus, the human can be practically understood by their behavior—'practically' but not wholly. (The use of 'practically' takes on hues of functionalism here, wherein two things having the same outcome are considered the same, just as the man who is practically known is deemed the same as the man who remains hidden beneath the observer's practical knowledge.) In this way—and taken together with extra-existential thinking that embeds the human in a sociotechnical

system—Meadows' 'least obvious' aspects of any human-involved system are most likely to be found in the region of human experience, or what was formerly deemed 'mind.'

The home presented in Figure x can be seen as a system, the behavior of which is that of human maintenance. That is, and harkening back to Maslow's (1943) hierarchy of needs, the home is a system that in its functionality satisfies the core needs of the human animal, albeit in what Herbert Simon would refer to as an artificial way. (Importantly, I do not believe the home can be conceived of as a system absent a human resident.) Simon defines the artificial in bullet-point style similar to Meadows' approach:

> Artificial things are synthesized (though not always or usually with full forethought) by man. Artificial things may imitate appearances in natural things while lacking, in one or many respects, the reality of the latter. Artificial things can be characterized in terms of functions, goals, adaptation. Artificial things are often discussed, particularly when they are being designed, in terms of imperatives as well as descriptives (Simon, 1996, p.8).

These relatively breezy definitions, however, lose their veil of simplicity when they are scrutinized, particularly through the lens of a home. We see that human actants can, and indeed must be, included in the system of the home: the home in so far as its primary function is that of sheltering the human-as-animal cannot be divorced from the animal it shelters. Without the human it is not a home, but a space (a mere 'house'), a structure undifferentiated from a cave, a hole, a skyscraper. The subject that couples with the object is no less responsible for the definition of the object that the object's characteristics: the home-as-system must be understood through the simultaneous lenses of its objective qualities and the qualities of the subject that couples with it. As such, the system is necessarily one that bridges the gap between subject and object, locating itself as the very crux of what Gibson referred to as the paucity of the subject object dichotomy.

If the home is to be considered a system, then it cannot be considered as such without simultaneous consideration of or accounting for the human actants that live through it. Neither, I argue, can any object in the Internet of Things or any of its various imaginations or instantiations (e.g., Internet-0) be adequately considered in the absence of the human agents it impacts.

While it has been noted several times over that the Internet of Things allows for different forms of communication, particularly those that leave the human out of the loop (as in the case of machine-machine communication), it is shortsighted to assume that any of these communicative acts occur in a non-human vacuum. Even the fallacious category of object-to-object communications must fall into the category of the real at some point: they do not communicate for themselves alone, but rather communicate in the context of a greater human world.

Although IoT and Internet-0 visions allow for scenarios wherein one object communes with another in the form of data, no such communication would occur without human intervention: design. The objects in IoT are as artificial as any that come to mind. They are artificial to the point of approaching the natural in their mimicry of communication. But they always already occur in the shadow of the soil that grows the plant, of the human that builds the house. Despite their retrodictive tendencies—the linguistic and therefore conceptual colonization of pre-internet media and materialities by the very connectivity to which they gave rise—IoT objects must be analyzed as objects of a world not fully in-line with the imagined goals of IoT: they cannot and should not be analyzed in terms of the imaginary in which IoT is pervasive to the exclusion of pre-IoT-humans, but rather analyzed in spite of this imaginary and in terms of their mutual co-construction of an always already human world. The ontological lines between home and city, city and body, body and home begin to dissolve: what arises in their place is a troubled spectrality of the gaps between ‘how’ and ‘what.’ This spectrality allows for productive analysis of the home in IoT.

Indeed, and in-line with Meadows, the diagram of an Internet-0-enabled home should be analyzed in terms of its least apparent actor: the human. As a structured system comprised of compartments, materials, and near-physiological modes of information transfer, the home in Figure ***x*** is as a body, crowned by the thinking center and the rejuvinating promise of sleep (which my FitBit tells me is important for mood, memory and physical recover…). Mobility occurs on the ground floor with its housing of the car and the doorway; so, too, does relaxation occur at the bottom (on one's bottom by the TV on the ground floor), with excretion occurring in the bathroom equidistant from feet and head. Wires like circulatory, pulmonary, and (most apparently) nervous systems of the human body carry information, commands, and electrical impulses from the attic on down and back. The configurability of the body with its contortions and flexibility meets the configuration of the home, but it is the presence of the server in the attic—at the top—that gives the diagram its resonance with the human body.

The use of attic space is particularly telling. The depiction of the residence's attic includes a cobweb in the upper right corner, as well as two mice in the lower right. These inclusions give the appearance of disuse. But the notion of pure disuse is complicated by the presence of a desk upon which the server stack sits. The absence of a chair also gives the desk an air of disuse. It is clear from the representation that this attic is not a place one goes — the chair has been removed as if to hint that direct interaction with the sever will no longer be necessary. The sever becomes the forgotten infrastructure of the house in a mode similar to attic space—the repository of materials no longer necessary but wanted; the archives of seasons, photos, workout equipment, and dust.

This is an attic of convenience, but a convenience of disuse. Absent are the notions of incremental maintenance, or of maintenance at all. The attic and its contents become a

technological bit of infrastructure intended to recede into the state of infrastructure: an invisibility. But this is an invisibility not only of functionality—invisible in and through functionality—but of memory and action. As we see in the representation of wires running like arteries through the walls of the house, the actions in the house and of the house are taken through this infrastructure. The wires, then, are part of the house—they contribute directly to what goes on inside the house. In contributing to the goings-on, they are the stuff of goings-on: they, like the treasured sci-fi collection of the avid reader, the guitars of the musician, the furniture and photos of a family, become wrapped up in the mundane experience of a rich life. In residing in the same space as boxes of stuff, the nerve center of this IoT-house occupies the same space as an archive of memories. It is as much a potential memory itself as children's Valentine's cards written in school: 'in the attics of my life…' (Grateful Dead, 1970).

I am reminded of a track by the Grateful Dead, by way of the diagram's stereo and its proximity to the attic, which will illustrate: 'In the attics of my life' from the album American Beauty. The opening lyrics are as follows: 'In the attics of my life / Full of cloudy dreams unreal / Full of tastes no tongue can know / And lights no eye can see / When there was no ear to hear / You sang to me.' In these lines, the attic stores the imagined realm of sensorial stimuli: tastes, lights, sounds. It is the repository of potential experiences, of the lateral jumps we make into the realm of 'what might be' versus what has been and what is known. But in being an attic, too, it is better or more clearly understood as the repository, the archives of what has been and been known so as to give rise to what might be. As such, it is the point where the brain meets the mind, but definitely concerted with the senses—the sort of inadvertent post-Cartesian wink that should be expected from California hippies so interested in the physical and mental experience of psychedelics.

But beyond adding a little color to the discussion here, Hunter and Garcia touch on something of key importance: the mystery of the mind/brain and the perpetual use of the mind/brain as signifier of the human. The diagram of the Internet-0-enabled home becomes successful in conveying the functionality of Internet-0 precisely because it comprises a visual metaphor for the human. For all of its overt focus on the technicalities of Internet-0 (and therefore the same sociotechnical imaginary to which IoT belongs) it falls flat in evoking anything more than a house—until, that is, the human is inserted into the diagram. In relying on the structure of the human, the diagram effects an unexpected marriage of subject and object: the house becomes a home precisely when the house takes on the characteristics of the human. There is not 'smart home' without the presence of the human that lives there. We simply cannot speak of the Internet of Things (as the category to which smart homes belong) without speaking of the human that must reside alongside it.

5.5 Analysis of IoT in the Home

5.5.1 Spectrality of the Subject/Object Dichotomy

In each of the videos described above the viewer encounters scalable and widespread interchangeability. That is, objects—such as those contained in the living room of a home, or those that are implicated in the maintenance and function of airport travel—can be linked together via an IoT network. They are assembled relative to a given situation, a given end: they are assembled in an impermanent way in order to achieve a certain goal. Objects can be networked together in order to set the mood for a movie night with the family or a good night's sleep; objects can be networked together to ensure heightened efficiency in crosstown travel, hospital visits, and trips to the shopping mall.

It would seem, at first glance, that these scalable and changeable assemblages are well described—perhaps fully described—by Redström and Wiltse's (Redström & Wiltse, 2015, 2018) notion of the fluid assemblage. But this is not entirely the case. Something stranger, something less ontologically stable is occurring in these scenarios: it has to do with the subject/object dichotomy.

Recall that Gibson, upon initially explicating his theory of affordances, highlighted the paucity of the subject/object dichotomy (J. J. Gibson, 1977). He wrote that affordances were neither properties of subjects or properties of objects, but rather arise between the two as a result of the relationship between the two. If we are to put stock in the theory of affordances as a means to explaining interaction (i.e., the forms of interactivity that arise between user and used) then we must lean into this paucity. In the shadow of fluid assemblages, it becomes necessary to consider when and where, under what circumstances, subjects mingle with objects in order to effect 'things.' Moreover, in the context of an Internet of things, it becomes necessary to explore the stability of the ontological categories of subjects and objects that couple or constellate (as the case more frequently is in IoT) to produce things. What does the production of a thing, an IoT-enabled thing, mean for the status of the subjects and objects that constitute them?

Consider the example of Movie Night. Movie Night is a selling point for Sony. It is a means to enroll potential users into a technological ecology, enrollment in which will ultimately lead to higher profits for Sony. (This is directly in-line with the implied role that corporations play in IoT as described in the topics presented in Chapter Four.) It is possible in this light to view Sony as the primary user. That is, in being the creator of the Movie Night assemblage, the use of which is intended (from the vantage of Sony) to result in increased profitability, Sony can be seen as a subject coupling with a series of objects in order to achieve a goal.

At first glance, the subjects active in the Move Night 'thing' are the mom, dad, and kids that sit down enthusiastically to watch a movie together. But this is not certain; it is not the only way to look at the situation. The Movie Night Family exists as both a set of subjects and a set of objects: their role in the execution of Movie Night and the maintenance of the greater technological infrastructure to which Movie Night and smart homes belong, renders them a chimera of subject and object: they are present and active in a form of spectrality. On the one hand, they are subjects coupling with the objects of their home in order to effect the thing of Movie Night. On the other hand, they are objects, enrolled into a greater ecology of Sony Smart Home technologies, to effect higher profits for Sony. Having been enrolled into Sony's technological ecology—Sony's particularly imaginary of IoT—they become objects, too. They are acted upon via the corporate subjectivity of Sony, and yet in being acted upon, they act upon other objects.

The Movie Night family is not ontologically stable: it belongs to neither the subject category or the object category exclusively. There in the comfort of their living room, they are as quantum objects. They are different entities from different vantages; their ontological status depends entirely upon the perspective of the observer.

This becomes somewhat clearer when we return to the notion of extraction described in the Intel Video that opened Chapter Four. At its core, Move Night is a data driven assemblage. This becomes apparent when one considers the central role that Netflix plays in this assemblage. Netflix is a recommender system, and an algorithmic one at that. Its functionality is predicated on the extraction of data, its analysis, and the feedback of results. These results take the form of recommendations: categories like "Because You Watched 'X'" appear on the screen just as much as categories like 'comedies' appear. Data is being collected, analyzed, and reinserted into the

umwelt of the Movie Night family. There is no reason to believe that this process of extraction begins and ends with Netflix.

To be a source of extraction is to be an object; to seek comfort and enjoyment in the company of one's family is to be a subject. The Movie Night family is both. The same can be said of the users that comprise the residents of the city in Intel's imaginary of the smart city: the city itself, presented as the central character—the protagonist—of the video, becomes the primary subject whose functionality depends on the extraction of data from its object inhabitants. The city dweller is not exclusively a subject or an object: she is both. She is the source of extracted data; she is the agent of her own actions within a given set of possible actions defined by the cityscape. In being the source of data that is to be extracted in order to heighten the functionality of the city in terms of safety or efficiency or, really, anything, she becomes part of the city: not as a resident, but as part of the assemblage itself. The city as data-collecting entity, as an IoT-enabled thing driven by the extraction and analysis of data, swallows her: she becomes infrastructural to the function of the city—as infrastructural as any lamppost, sidewalk, or fire hydrant.

Ontologies are flattening in IoT, but not in a way one might expect. It is not a flattening that unifies all actants in the category of subjects or of objects. Rather it is flattening in such a way that the biune construction of the subject/object dichotomy expands to include and highlight the liminality that divides the subject from the object: a liminality comprising the natural habitat of the chimera.

In the next chapter, I will examine this liminality at the boundaries of the human body—it has been called the philosopher's last line of defense (see Chapter Two). As such, it seems possible that it is the last true line of defense for pure subjectivity: for a state of subjectivity that cannot be

colonized by the category of the object. This does not bear out. But first, there are other aspects of the videos and diagram analyzed in this chapter that warrant discussion.

5.5.2 Technical Images: The Chimera in its Natural Habitat

In many ways, Flusser's notion of the technical image is well suited to describe, and perhaps explain, the emergence of subject/object chimeras—an artificiality that is natural in its production, but unnatural in its influence over the natural. In the introduction to this chapter, I deemed it necessary to approach the technical image via Simon's dichotomy of the natural and the artificial for one main reason: the work of Flusser is still largely unknown. (That is, his work has nowhere near the recognition that, say, McLuhan or Kittler has.) And yet, the artificiality of the technical image—the very notion of the technical image itself—was prescient: Flusser's original German text, '*Ins Universum Der Technischen Bilder*' was published in 1985. It was only translated into the English in 2011.

The technical image is a complex concept. That is, it is both complicated and complex. Its nature is complex; its description is complicated. As one might expect, given the presence of the term 'image' (*bild*) it has at least to do with representation. In fact, it has to do with two forms of representation (*bilden*): an image of something as in a drawing, painting or photo; and an image of something as in a mental representation. (The difference between these two terms, *bild* and *bilden* in the language of Flusser's thought is not unlike the Foucauldian difference between *les archives* and *l'archive*: subtle linguistic differences take on great meaning and allude to membership in different ontological categories.)

For Flusser, the plural, *bilden*, not only refers to multiples of a given type of image (e.g., a photograph), but also to the plurality of the ontological image: ranging from a mental concept to

an inscribed image carried on a substrate. *Bilden*, then, carries with it deep questions of directionality: the human has a mental concept; the human represents that concept via an image (e.g., a painting or sketch); that image then feeds back into the mental concepts possessed by the human. (NB: this is emphatically not an argument for representationalism as it occurs in the cognitive science literature: I do not argue that world of the present, the lived-in umwelt, occurs in the human mind as a set of representations; I do, however, argue that the future possibilities of the world, the designed possibilities of the human umwelt, reside in representations. There is no extant future object, only projections and assumptions about future objects; in the absence of an object [according to Eco], we must rely on signs; signs are representations. The future, therefore, in the mind must be a representation: an abstracted image of possible constellations of 'things.' The future, in this light, becomes a mode of representation.)

When, returning to the directionality of *bilden*, the technical (i.e., externalized through the use of media, practice, and technique) representation of something is fed back into the conceptual *bild*, the present tense, lived-in umwelt expands to include the realm of the possible, the conceptual. We might say, then, that the present tense, lived-in umwelt expands via images to include the future: to include assumptions about the future as manifest in the externalized image.

This is all well and good when one thinks of the feedback loop between, say, cave dwellers and early images of wildlife painted on the cave wall. That is, little has changed but for the ontological status of the wildlife: they, through the act of painting, become solidified not only as 'animals out there,' but as members of the conceptual set of human-relevant objects that populate the human umwelt. (One might argue, too, that the creation of the externalized image which then feeds back into the set of conceptual images [semantic maps] of the world is a first step towards the realization of what Heidegger referred to as 'standing reserve.') But the externalization of an

image which is then re-internalized in the form of an ontological entity becomes orders of magnitude more complicated as this feedback loop is perpetuated. Externalized images become so internalized as to be inseparable from the original internal set of images: the artificial feeds back into the natural such that the membrane bifurcating the concepts of *bild* und *bilden* becomes so porous as to cease to be a membrane. It becomes an obligatory passage point between the present and the future; between one topology of discourses and another; between one set of historical *a priori* conditions and a subsequent set that gives rise to a new (historically defined) epoch or era.

It becomes all the more complex when the externalized images are not human-produced. (Here we encounter a more contemporary, popular notion of 'technical.') When representations of the world are created and externalized (*vis-à-vis* a human subject) through purely technical mechanisms—the GUI, the cinema, CAD and 3D printing, algorithmic recommender systems, findings derived from computerized empiricism,—then the set of internal images through which a given human makes sense of the world (i.e., the sociotechnical imaginary) becomes unmoored from the human: it drifts into the realm of the artificial, the technical (in the common, contemporary sense) and pulls with it potential futures that reside in the mind of the human. What results, in my reading of Flusser, is a particular form of absurdity: a human-created world of concepts (images) that no longer has the human umwelt as its central grounding point, but is instead oriented in such a way that the human must acclimate to un-human images: objectifying images born of the epistemologies that, since at least The Enlightenment, have 'freed' man from his self-imposed nonage, and in so freeing man, bind him to a rack of images.

Through the feedback loop that is constituted by the convergence of temporality, embodiment, spatiality, and conceptuality, the externalized image becomes a dual object: an object in the sense of its materiality (e.g., printed photo, digital photo, painting, etc.), and also a projected object in

the sense of possible futures. It is in this duality of object-ness that the complexity of the role of 'the thing' in constructing a future comes to the fore: the object in the world is also the object in the mind; the object in the mind can be manipulated in ways that the object in the world cannot. (Consider kaleidoscopic or palimpsestic constructions of dreams; the resonances that images have with memory and the idiosyncrasies of memories, not only in terms of accuracy, but of experience.) The space between the object in the world and the object in the mind presents as a possible site for the seeds of discursive transformation: when the object in the world is augmented, diminished, amended or tweaked to more closely resemble the object in the mind—an object that, as I have stated above, is future-oriented—then the affordances that arise between subject and altered-object change by way of the object's alteration: thus a new 'thing' is born; a new discourse possible. Along with the possibility of a new discourse comes the possibility of an emergent new set of historical *a priori* conditions. The site of discursive change must be the 'thing;' the 'thing' must in part be human; the mechanism of discursive transformation, then is to be found at the interaction between the two types of images: the *bilden* in their conceptual and material forms.

But this is somewhat far afield from the possible findings we can draw from the chapter ahead. Rather than constituting a finding, the above logic constitutes a sort of theory (constructed from anecdotes and logical inference; from abduction and speculative deduction): can we support this theory through the close analysis of the various media formats used to construct technical images that pass from the mind to the world and back to the mind?

We must surely try to do so lest we, as a species so in-tune with consumerism and the 'having' mode of being concerned with the accumulation of objects (Fromm, 2013), find ourselves bound to a mode of being we have engendered but not willed—a state of absurdity that has its roots in the phenomenological, existential incommensurability that characterizes the human-computer

dialectic, the idea that computer-derived images born of phenomenologically inaccessible observations might feed back into our social imaginaries and perform a sort of human-ectomy. Two ontologies diverge in a wood, but they intersect again in the space between paths.

There are multiple forms of objects and subjects that appear in the videos described above—in the *bilden* in their conceptual forms. The *bild*, the image-as-thing, constructed by the coupling of viewer and the material substrate that carries the viewed (e.g., a computer), engenders a scale-free space, a space wherein all is possibly constellated together. In such possible constellations, the heretofore fundamental boundary separating the subject from the object is crossed. Indeed, it is temporarily dissolved. As a form of mystical thinking—a pre-narrative state of communication—those entities that, by means of relationality, we would call subjects and objects in the phenomenal world, are divorced from such indexicality in the video when it is divorced from its material form. When the contents of the video are not seen via video, but rather through the lens of imagination or translational distanciation, the indexical, phenomenal world of stable ontological categories dissolves to reveal unlimited assemblages. These assemblages, constructed and compiled in order to achieve some goal—brought together for some purpose—are necessarily heterogeneous. But their heterogeneity extends beyond the biune categories of subject and object: it extends into a realm wherein the observer impacts the category to which the observed belongs; it extends into a realm wherein an observed entity can exist as both subject and as object simultaneously. Indeed, this realm seems to be the realm of IoT writ large: a massively scalable infrastructure whereby the phenomenal world, previously defined in terms of the linguistic and cognitive categories of subject and object, explodes in synchronicity with purpose: a designed synchronicity characterized not my temporal similarities—as in two turn signals blinking in

rhythm—but in ontological similarities, transient and ephemeral relative to the assemblage they form.

Through this lens, the future of the human in the imaginary of IoT is one that is predicated on an expansion and a reduction. The human of IoT will no longer be a pure subject: to be engaged with an IoT-enabled thing is to give oneself up to the power of objectivism, the power of the known and reduced world; the future of the human in IoT is also an expansion—an augmentation—via reduction. We give our fragmented subjectivities into the assemblages of the chimerical to receive: we receive an understanding—an epistemological vantage from which to understand—of the human as something wholly knowable. We operationalize the human through their interactions with not the lonely, un-networked objects of their lives, but through their interactions with networks: their interactions that can be extracted in the form of data. In this way, the future of the human is that of the ghost in the machine: but a ghost that has voluntarily crossed over, giving up the body for the machine. We give over our bodies as they have existed—as they have been known through the objects with which we couple, and in coupling with exert control over, as in the traditional forms of archival materials ranging from the analog to the digital—and receive, as a result of this transaction, an inherited body derived from incomplete technical images: we receive a body half complete, a Frankenstein's monster—for better or worse—comprised of visions, *bilden* tinted with optimism or pessimism, the long futures and convenient predictions of utopian states or dystopian states. We give over our bodies such that they may be transformed by our own unknown forces of transformation, those forces—archival and lived, living through and in the archive—that characterize the spectral presence of the *bilden* in the *bild*.

5.5.3 Through a Screen Darkly

If the previous section was devoted to the *bilden* —the possibilities of the technical image when divorced from the material substrate that carries it, translates it into the *bild*, or the image-as-thing—then it is now time to consider its reciprocal: the complementary form of image that gives the technical image representation and interactivity in the phenomenal world. This material substrate is the screen.

The screen is omnipresent in contemporary imaginaries of IoT. Even in the case of Alexa or Siri, or other such dis-embodied digital assistants, screens are unavoidable: we procure our apps from them, buy Alexa's skills through them; Alexa paints the world as a screen, furniture and lamps and stereos as icons. The metaphor of the icon extends beyond the screen to create screens. Even when it is specifically absent from a given IoT-enabled device, it is always already present as the primary point of mediation between an IoT-descriptive narrative and the reader/viewer of that narrative. It is the site of the narrative's ephemeral inscription, an Etch-a-Sketch presenting impermanent representations begun and ended with the click of a button, the tap of a key. Play, pause; start, stop; it waits to be reviewed, to be seen again and to present new subtleties, new possibilities of experience within the projected realm of IoT. Thusly expand and contract the possibilities of the various imaginaries of IoT. As obligatory passage point between imaginary and individual subjectivity—between the technical image of the future and the interactive image of the present—the screen is as a primary medium for the archive of IoT: it is the substance and the substrate that provides access to the description of IoT, beyond (and frequently before) the IoT-enabled devices themselves.

That the screen constitutes the entry point into the archive of IoT, itself the container for multiple imaginaries of IoT waiting to concretize in the form of received historical *a priori*

conditions, is confounding. It confounds because it is highly reductive: the world through one perceptual pathway. Given the scalability of IoT—from city to home and, as we will see, to the body—such a reduction of the world to the visual pathway seem contradictory.

When one speaks of the archive maintained by and comprised of statements—documents, events, enoncés—one is speaking of permanence or of a presumed level of documentary durability. The archive abides, surviving in a carefully curated form such that narrativity is continued between tenses. The archive that survives through images, through the image-as-thing when the object-image couples with viewer, is always already incomplete: it is an archive of the visual cortex, an archive fed through one sense and filtered by the most current understandings of human (and computer) visual processing. The archive, in other words, is comprised of artifacts that tether the present to the past, and in doing so, tether possible futures to the myriad, rich, and heterogeneous present tenses that are experienced with and bounded by a given historical *a priori*. But how is this achieved through the screen if the screen is merely the medium responsible for presenting the contents of the archive?

The screen, like the page for Derrida (Derrida, 2005) and Freud (Freud, 1951) before him, has become inescapable—not as in the prison of the event in the theory of the Annales School, but as in the folds of tissue in which we are embodied, our memories preserved and enacted where internality and externality meet. The screen has become the singular and primary physical metaphor for the contents of the archive, a site for projection and reflection between the internal and the external, between the known and the unknown, between the past and the present and all of the possibilities resident between the two. One theorizes and describes the memory of the archive by means of the screen as much as by means of the written word. Indeed, in the realm of IoT representations, the printed word rarely stands alone, instead being coupled with images. It

retrojects onto the page, becoming the means by which the page is accessed as in the case of archived magazines, books, images; the screen claims the page as the page's descendent, its successor in the form of the tablet, the computer screen, the television screen—all rolled and rolling in the present tense into the same metaphor: a surface with which one interacts with intangible representations.

The presence and prevalence of the screen colors the possibility for narrative construction within the archive just as the physical characteristics of the page, the scroll, and the stone before them, bounded notions of the archive to the act of inscription—to the poetics of additive reduction, wherein substance is removed by means of the chisel so as to create semantic content, meaning. The archive, by means of the media formats that populate it, is first and foremost the memorial mesenteric tissue that connects eras, that connects the historical *a priori* of then and now, of as it was, as it is, and as it might yet be. The media formats that, in populating it constitute its durability and possibilities for interaction between reader and inscribed substrate, comprise the affordances of the archive and constitute the site of its transformations, its motions. But this combination of 'the archive' and 'affordances' requires explication—even in my own mind, it rattles with some uncertainty. The recognition of such uncertainty, though, is perhaps reason enough to explore the relationship between these two concepts.

On the one hand, there is the archive; on the other, there is the notion of affordances. As I have already stated, I inherit the notion of affordances not from the design or HCI fields, but rather from ecological psychology and what might generally be referred to as post-Cartesian cognitive science. (In particular, I rely on Anthony Chemero's treatment of affordances within the greater theory of radical embodied cognition [Chemero, 2011; Penny, 2017]). Productive uncertainty arises from the meeting of these two concepts because affordances arise in a 'real' world—a world of

experience; the archive, on the other hand (and particularly for its progenitor, Michel Foucault) bounds the experience of the real world—that is, Foucault's archive exists as a theoretical construct that is never wholly seen, but only inferred through the analysis of archival documents in accordance with his archaeological method. What is required at this point is the construction of a bridge between these worlds: between the affordances that arise between subjects and objects as a result of their combined characteristics—one might think of this combination as the point at which two *umwelts* intersect—and the set of discursive statements that constitute the limits of possible statements about the historicity of the world or an era.

If one approaches the human archive (*l'archive*) as an historiographical domain, the existence and characteristics of which can only be inferred through access to and interaction with *real* documents stored in documental archives (*les archives*), then the intersection of affordances and the archive becomes visible. We construct statements about the future, derived from statements contained in the archive, via interaction with the physical characteristics of the statements in the archive: the archive becomes an interface. The relationship between the archivist—or, perhaps more accurately, the archaeologist of knowledge—and the archival document constitutes a subject-object relationship. As a result of this relationship, or perhaps at the core of the relationship, the very essence of the nearness and interaction that constitutes a relationship, the archaeologist of knowledge is able to interact with archival objects in certain ways: affordances arise in the space between the archivist and the archival document, a space that is characterized by a specific form of knowledge production. This form of knowledge production is historiographical, but an embodied form of historiographical production. It is predicated on the intersection of sensation and perception and the history of ideas.

But by suggesting that affordances arise between archivist and archival document, I do not mean only physical forms of interaction—surely, the archaeologist can pick up a stack of papers, or write on them, or indeed burn them in the case of totalitarian, revisionist regimes. By suggesting that affordances arise in the form of a subject-object relationship relative to the archive, I mean that the archivist can meaningfully interact with, gain access to the semantic content carried by a particular media format in a way that is colored by the physical characteristics of the artifact. Film is not the same as text. If the mind-body duality that has pervaded Western ontology since the time of Descartes is set aside for a more holistic view of embodied or enacted cognition, then it must be said that thinking—logical and conscious analysis—is a physical action distributed across the embodied mind and its environment. In the instance of the archive, this environment is comprised of physical entities: it is where the technical image of potential futures is coupled with an inscriptive substrate and therefore granted access to the human *umwelt*. The conceptual and historical relationships that bind these physical entities together into a reality capable of being understood must be grounded in the affordances that arise between the historian and her documents, the archaeologist of knowledge and her archive.

Although likely controversial, this theoretical approach realizes the archive in a way not previously achieved: it renders *l'archive* interactive. It places the archive in the present tense: not a present tense of analysis that looks back on a bygone era, but the present tense of breath and step, the long present tense that binds contemporary discourses together in the form of our immersive historical *a priori*. It is in this realm of interaction, in the affordances that arise between subject and object, that at least one of the elusive mechanisms of discursive transformation, I believe, can be found. Statements born of or prevented by the archive, are so by way of how one might interact with the documents that constitute the archive. The interpretability of a document—the extent to

which the archaeologist of knowledge can gain access to the semantic content borne by that document, as well as the greater archival history to which that document belongs—must be affected and effected by the very form the document takes.[127] Given that contemporary statements, particularly those made through digital channels such as Twitter (as seen in Chapter Four) are accessible in real-time, the archive is now accessible—at least in-part—in real-time. We are in it and of it, and having granted ourselves access to those digital *fonds* via the creation of artifice, we grant ourselves access to our own potential transformations: we exist first as foremost in the contemporary, accessible archive as subject/object chimeras.

But more than that: we exist as chimeras might appear in the context of a known dichotomy. Insofar as we grant ourselves access to the archive, we render ourselves pre-archival. We place ourselves in the temporality of the proto-object, the proto-subject: the proto-statement. We position ourselves as present-tense building blocks of discourses, or statements and events. Interestingly, in the context of the current factual climate, the absence of gatekeeping mechanisms can potentially explain the rise of fake news: in granting ourselves access to a present tense archive, we wrest control of that archive from the gatekeepers—the trained journalists, the scholars—who have heretofore vetted statements, and in vetting statements, have assured the fact-based relationship between archive and description.

In that inscriptive substrates bound the means of interaction with what can and cannot be said, bound the interactive possibilities relative to the contents of the archive, they must also bound the very nature of the semantic content contained in the archive; the physicality of the archival comprises a knot, a world in-motion (and an archive in-motion) that not only can be, but must be,

[127] Lisa Gitelman has done some fine work in this area, although work that uses a different vocabulary, in her work on paper knowledge (Gitelman, 2014); Cornelia Vismann (Vismann & Winthrop-Young, 2008) has done similar work in her investigations into the role of paper files in the production of legal knowledge.

accessed and interpreted in the present tense. As I will demonstrate in the third section of this dissertation, the archive arising from the fundamental changes in subject/object constellations that comprise things in IoT gives rise to a set of possible imaginaries that, under certain conditions, may evolve and concretize into a future historical *a priori*—a future archival condition with new rules as to what can and cannot be said; new boundaries of discursive possibilities, and indeed new set of discourses.

Chapter Six: IoT at the Scale of the Body

6.1 Introduction

In Chapter Five, I demonstrated several matters of concern that define the discursive constellation of IoT. First, IoT is described as a system of systems. The interactivity of these systems is imagined to give rise to intelligence. The nature of this intelligence, however, is uncertain. Its uncertainty stems from it questionable source: is it an intelligence that is best described in the passive voice or the active voice? It is created or received? Do these binary considerations apply?

I also argued that the intelligence that emerges from systems of systems does so via the action of extraction. What is extracted? Data. In being extracted, the creation of data renders the user of a given IoT-enabled device as an object: she becomes, at least from one vantage, an object from which data is extracted like so much ore from a mine. While the extractive essence of IoT has positive impacts on the systems it affects—traffic grids, hospital databases, electric grids, etc.—it is not so much the valence of IoTs effects that concerns me—particularly at the larger scale of the city. Rather, it is the extent to which these effects shape and reshape the discursive structure that defines our contemporary historical *a priori* condition. I am concerned with the development or perhaps evolution of a new historical *a priori—a transformation of the human archive*—a future that is contained like so much subtext in our current present tense.

If, as argued in Chapters Two, Four and Five, there is reason to suspect that the ontological status of the human-as-subject is changing or transforming in relation to the emergent class of things that populate the imaginary of IoT, then we must dig a little deeper to identify concrete examples of this transformation.[128] To do so, I zoomed in from the abstraction of the city scale to

[128] It is not my position that prior to the emergence of IoT the human was solely a subject from an ontological perspective. Rather, it is my position that the subjectivity of the human was the human's primary ontological category. There is a fine line between the subjective and the objective when, read alongside Kant's description of The

the scale of the home. The site of the home—the smart home—was chosen predominantly because of the association between the experience of being a human and the experience of being home. As Abraham Maslow posited in the early 20th century (Maslow, 1943), shelter is a basic human need; as Csikszentmihalyi and Rochberg-Halton (Csikszentmihalyi & Rochberg-Halton, 1981) demonstrated towards the end of that century, we populate our homes with objects that carry emotional significance and, indeed, help us define our personality. The combination of these positions indicates that the object-constitution of the home, of our idealized and constructed shelters, constitutes a perspicuous site for considering how IoT enabled objects might change the experience of being human.

I demonstrated that the notion of 'discovery' within the rhetoric of Sony's smart home imaginary does, indeed, indicate a change in the choreography between dweller and dwelling. The boundaries of the home, its walls both physical and metaphorical, break down to invite the external world in. The invitation of this external world into the home—not unlike the invitation of a vampire through a window—forever changes the dweller's relationship to their dwelling. The home is experienced as a realm of the subjective—of movie nights and bedtime rituals—but also as another locus for the production of objectification. I further demonstrated that, in order to encourage enrollment into the existence of this hopeful monster—a monster that is made all the more hopeful by its juxtaposition with such a staid concept and cultural trope as the 'home'—rhetoric surrounding the smart home is highly focused on contextualizing smart objects in terms of unsmart objects. In this light, the smart objects of IoT colonize the realm of the unsmart. With such

Enlightenment as the human's emergence into philosophical maturity, the human comes to know themselves as a subjectivity through the processes of self-reflection as they are guided by objectivism. In the present tense, however, I contend that Ourorobos has swalled his tail: that the human has become so adept at knowing themselves through objectivizing mediations that their subjectivity is disappearing.

colonization also comes epistemological colonization: the home is known through objectivist reduction; the dweller becomes a function of that process.

I also discussed the treatment of the smart home through the medium of the diagram. In my analysis of an early smart home diagram, I demonstrated that we tend to think of smart homes—or scales in general—in terms of prototypes. Rooms all have the same shape; cars fit in bathrooms; there is a hub through which electricity and data flow, not unlike the hub of the brain in the body. Through this, we see that the notion of the body is tied to the notion of the smart home: the body serves as mental map, as a metaphor through which we envision futures. What emerges, then, is a difference between the idealized, diagrammatic representation and that which is represented as it exists in the phenomenal world and the end of our interface-fingertips. The noumenon of the home disappears into the realm of the technical image, where such an image is taken to be objective; the human subject, then, defines themselves in terms of this technical image, thus removing themselves further from the possibility of a pure subjectivity.

Emerging from the difference in representation between the traditional home and the smart home—represented equally through visual images—is the human-as-resident of the technical image. Insofar as we design our smart homes based on a prototypal diagram, we also design ourselves by the same means. That is, in the video representations of smart cities and smart homes analyzed in Chapters Four and Five, the human emerges as a hopeful reflection of herself: she is reflected and refracted through an imaginary of the future, a future of IoT-enabled objects, and thusly sees herself in terms of that potential future. She becomes a negative of this future waiting for development through the assimilation of technologies; she also becomes the developer of this negative.

Still, there is more to be done before we can definitively hypothesize that the ontological status of the human is changing—that a transformation of the human is, indeed, taking place, and taking place via a discursive transformation of the 'thing.' This is the focus of the current chapter: to analyze and theorize the relationship between the human-as-subject and IoT-enabled objects as they couple to produce a thing. To do so, I turn to the final scale of IoT that will be addressed in this work: the scale of the body.

6.2 Approaching the Body

Having provided descriptions and some little analysis of promotional materials that relate visions of IoT at the scale of the city, and again at the scale of the single-family home, it is now germane to proceed to IoT at the scale of the individual. While, in the context of smart cities and smart homes, we have already begun to see a certain, subject-object fluidity that arises from the perspective adopted relative to the components of a system within a system, it is necessary to approach the relationship between IoT-enabled devices and the human body in order to observe the extent to which subject-object constellations—as well as the ontological stability of subjects and objects—may effect a transformation of the human. In doing so, we will also consider the extent to which the human body, in potentially becoming a subject-object chimera should be considered a media format unto itself. Notably, the possible consideration of the body as media format is both derived from McLuhanian logic and contradictory to McLuhan's own treatment of the human body.

The body exists as the subject's interface with the world; in being its interface, it is the subject; the subject is one with the body, where the body is not differentiated from the mind. The body (including mind) is the locus of agency; the body gives agency and constitutes subjectivity, where

subjectivity is derived from the experience of living within the human archive, a parcitular niche-*umwelt*.[129] In order to sufficiently examine the thesis that the IoT heads a fundamental discursive transformation of the human and that this transformation is one in which the boundary separating subject and object is dissolved, we need to examine the subjectivity of the human body—of the embodied human—in terms of its coupling with IoT-enabled devices.

As with the last two chapters of this work, my analysis of promotional materials regarding IoT at the scale of the body will be divided between several media formats. While each of the devices I cover will be addressed by way of video advertisements for said devices, I will also pay close attention to a heretofore undiscussed aspect of mediation: that of the package in which the device is sold.

6.2.1 A Note on Scale

Although the progression from city to home to body gives the initial impression of reduction in scale, this impression is paradoxical: as I will show, the smallest unit present in this tripartite set of imaginaries—the individual—can, from certain vantages, function as a great deal larger than any of those scales previously discussed. This is not simply the case as a result of the mobility displayed in the videos I will presently describe and analyze—although mobility plays a role—but because the individual, ripe with experiential memory, idiosyncratic logic, spaces in thought, and myriad emotional attachments, is perhaps the most unpredictable of the three scales. A city functions as a city; a home as a home. But the individual, in functioning as an individual, cannot

[129] This operationalization of subjectivity stems from my interpretation of '*Vampyroteuthis Infernalis*' (Flusser & Bec, 2012). My subjectivity, for example, is not reducible to my cat's, nor his to mine. This irreducibility stems from the sites of our subjectivity: our bodies, each of which is designed to construct and support a specific umwelt, although there are some points of unison.

be relegated to a defined set of actions unless we wish to reduce individuality to those sets of actions required for the maintenance of life as they are colored with idiosyncratic experiences, beliefs, and motivations.

The subjectivity of the body—the body-as-interface to the human archive in space, time, and culture—renders the body phenomenologically irreducible if it is given that subjectivity is mutually exclusive from objectivity. In the event that these two categories transform in such a way as to mingle, or blend, then the human body (the body as interface with the human archive) becomes not a locus of irreducible subjectivity, but just another (de)naturalized, objectifiable entity. It is an object in its construction and a subject in experience.

The body as locus for agency, as the container of the irreducible individual, becomes something to be known in the way that astronomy can be known; it becomes the subject of GPS rather than wayfaring; it becomes an object of knowledge that, in being objectified, loses its status as primarily subjective. The knowledge by description (Russell, 1951a) most easily associated with positivist science (objectivism, empiricism) colonizes the category of the body: in so colonizing, it supersedes subjectivity. The body, to borrow a titular phrase from Josh Berson, becomes computable (Berson, 2015): it is known through computing and transformed through computing. In becoming not only possibly computable, but fundamentally computable via its constellating with myriad IoT-enabled objects, the body—including the mind—becomes an object itself; its new objectivity arising from a shift to digital modes of computing. It is the goal of this chapter to see how this logic plays out; to trace the colonization of the subject by the object across scales.

One is tempted to think of cities as sprawling—as in the naked city, a million stories backlit by neons and exhaust—and this *can* be the case. But a city is *only* a city. And, indeed, the 'city' of smart cities stands in for any social and structural grouping of residents: the 'city' includes under

its semantic umbrella such places as villages, hamlets, suburbs, cul-de-sacs, even (possibly) large scale apartment complexes. Put differently, the 'smart city' acts as a semantic container for sets of residential dwellings (and infrastructure, too) that are ostensibly in close proximity to one another, that rely upon the same set of infrastructures for functionality (e.g., roads, power grids). It ceases to be one, speaking of the concept, when it is considered in any unit of measurement smaller than itself: from city to borough to neighborhood to block to street to home, only the first is truly a city; but each of the slightly smaller units of analysis, up to but excluding the home, appear as categorically equivalent. Each reduction in scale, each increase in specificity chisels away at the unity of the 'city' concept, reducing its referent to something smaller, something distinctly un-city-like.

Whereas the Intel video described in Chapter Five approached the city as an actant unto itself, a system with its own functionality and experience that includes, but is not wholly predicated on individual experience within that city, the videos that follow attempt to present certain biological functions of the individual as representative thereof. If the Intel video presented the city from a top-down view that never really zooms in below the signifier 'city,' then the FitBit videos that follow provide a bottom-up view of the individual that never really approaches the bottom from which it presumes a vantage: this bottom, this subjectivity, is replaced by an objectivity, a representation grounded the extraction of data derived from the of a given device. (The human is reconfigured as user [Woolgar, 1990]; the user is reconfigured as the used.) The data forms that are collected—steps, heart rate, calories burned—are inherently of the individual, but the circumstances in which these data arise hint at a gestalt much greater than any possible agglomeration of data. These data points link the subject to a greater network of objectified standards. In so linking, these data break down the ontological barrier between subject and object

by rendering the human-as-subject, engaged in their mundane activities, as objects from which data is extracted.

If the city is only a city at a particular vantage, then the same can be said of a home. Each of the rooms, the levels, cumulatively add up to a home, but a home cannot be spoken of by virtue of one room or one floor alone. The person, on the other hand, is inseparable from itself: to speak of one's steps, while framed by the datafication of movement and the body, is always already to speak of the places these steps occur, the person—the individual—taking those steps in a given environment. Although, particularly in the FitBit promotional materials, one sees the individual broken down into analytical units such as heart rate, steps taken in a day, etc., the unit of the person, no matter the level of analysis, cannot be removed from the greater environment which constitutes them *as a person*: through the use of the FitBit, and if entirely enrolled into the digital-objectification of the person, they cease to become a person in the individual sense. They are reduced.

What arises from this notion of personal irreducibility—and as I shall demonstrate through the following descriptions and analysis—is a complex feedback loop from the individual and its constituent parts (e.g., circulatory system, musculature, personality, drives, etc.) to a group of sensor-imbued objects, and back again by way of a set of largely unidentified actants: the FitBit application, its GUI, its underlying code, the programmers who wrote this code, the sales departments and advertisers and marketers responsible for enrolling individuals into the purchase and use of such devices. But most importantly, the unidentified actant extant in this system, the unmarked category, resides in the availability—the ready-to-handedness, an interface just a touch or swipe away—and pervasiveness of objects that allow entry into this imaginary.

As I shall demonstrate, the individual as it is presented in the FitBit promotional materials is a complex and transformed one: it is an individual that is subjective only through the lens of an objective definition of subjectivity. The individual is constructed through extractions of data. If the goal of IoT in the Intel video was extraction—and this goal applies to FitBit, as well—then it is the form of the extraction, its nature and feedback, that transforms the user. What we find is: an individual extracting data from themselves, passing it through an external constellation of technologies, and reinterpreting these extracted data so as to effect some change in their behavior. Heretofore, this process could be entirely contained within the body; it might also be externalized in forms such as inscription (i.e., self-tracking via note taking); but the present tense represents the first time in which self-tracking—the opted-in path of objectification—occurs at the scale of a massive network, a massive database.

In effecting a change in their behavior, the user is in essence effecting a change in their particular niche of the term 'individual.' The user passes from subject to object and back again, although never wholly subjective once they have been treated as an object. In FitBit the mind is divorced from the body, as in Cartesian dualism, and such a divorce is further concretized by the alienation of the body from the mind in the form of data and external, prosthetic analysis. Acts of cognition—counting, analyzing, assessing—are offloaded to prosthetic devices. That part of the body most associated with cognition, the mind, is outsourced: the body becomes an object of a subjective object that links the body to a greater infrastructure of objectified subject composition.

The materials that I describe in what follows present and describe the characteristics and potential use cases of two different models of FitBit: the first is the Zip; the second is the Alta HR. These two devices represent not only different interfaces embodying various facets of the FitBit imaginary of IoT, but also a temporal progression from old to new. In addition to analyzing the

video promotional materials, I will begin analysis at the level of the packaging material and sometimes the schematics for these devices. My goal in doing so is to adequately describe and represent the fuller textuality of these devices—beyond the chassis that contains each of them—so as to get a better sense of how the physicality of these objects and the inscription bearing substrates that communicate their functionalities constitute different aspects of the imaginary of IoT.

6.3 Bodies, Backbones, and Blood

6.3.1 The FitBit Zip

For all that we've said about representations of IoT-enabled devices, there has been one conspicuous absence: the objects themselves. This is not because of some methodological oversight, but rather because it is difficult (near impossible, I think) to choose an object or set of objects representative of those lenses through which we've looked at IoT: the smart home and the smart city.

IoT appears as a set of infrastructures—or one hopeful infrastructure—that unfolds across various scales, thus possibly defying the validity of 'scale' as a means of analysis. At once there is the IoT as it appears in the 'smart home;' the IoT as it appears in a 'smart city;' and the IoT as it appears relative to the human body. It is simply beyond the scope of this project—and, indeed, not in line with the phenomenological and humanistic leaning of the project—to undertake an actor-network analysis of the actors in a smart home or in a smart city and thus approach the truly representative object of these categories. It is, however, possible to find the lowest common denominator within the scales of infrastructure that IoT touches: the human.

So, if we are to return to the things themselves—or finally approach them!—it is necessary to choose an IoT-enabled object with which users regularly couple, and couple at a relatively large scale. With a user base of nearly 100 million (roughly one third of the entire US population), the FitBit comes to mind as a perspicuous object of study. The FitBit also serves as exemplar for the relationship between the human subject and the IoT-enabled object because of its function: it measures and tracks human activity.

In the following discussion of FitBit devices, I move from an analysis of the relationship between subject and object, where the object is a representation of an imaginary (as in the cases of the videos, emails, and other texts described in previous parts of this chapter) to an analysis of subject-object coupling at the level of the actual device: where the rubber meets the road of hopeful infrastructure, as it were.

Still, this is not as simple as it might appear to be. We cannot merely approach the FitBit device willy-nilly. The device, after all, does not appear to the user as a device alone. Beyond the representations of the device—the advertisements, the images on a webpage that allow a person to order a FitBit—the first appearance of the device is that of the packaging in which it arrives. This is the first object that is held, the first that meets the skin, the body. It is the first truly interactive and tangible facet of the FitBit device. So that is where we begin.

The FitBit Zip and Alta HR are basically pedometers. This can be said of all of the devices manufactured under the brand 'FitBit.' Some are a bit more nuanced in their functionality—allowing, say, for the monitoring of physical activity in a pool, or keeping track of a runner's path using GPS technology, receiving text messages, playing music—but they all stem from the notion that steps can be measured and therefore used as a proxy variable for fitness. More broadly, they

fit into the emergent category of 'personal tracking devices' within the greater tradition of wearable technology—a tradition that presents as a sort of technical ancestor to IoT. In wearing a FitBit, the wearer is given access to an externalized count of steps taken per unit of time and the number of calories burned as calculated by a proprietary algorithm. Data can be viewed on the device itself or via a computer or smart phone application. Each of the devices also—as is generally the case in mainstream wearable technologies—functions as a watch. ("Calling Dick Tracy! Calling Dick Tracy!")

I use the term 'wearer' here in place of the more generic 'user' because the gestures of 'wearing' or 'donning' are notably different from that of 'using,' where 'using' implies direct and intentional interaction with an interface. It is also too fortuitous a linguistic overlap between the vision put forth by Gross (1999) to be ignored: in wearable technologies, one finds the meeting point of an earth that dons and electronic skin and a human subject that augments their body with a node of that electronic skin.

As opposed to the user, in the case of a wearer the interaction is somewhat less direct: the worn technology becomes folded into the daily actions of the user, even when those actions are not explicitly directed toward the device in question. (This is known as acclimation in the psychology of sensation and perception: that to which we are acclimated falls below the threshold of activation relative to conscious sensation or perception. We simply forget that whatever we've acclimated to is there—the canonical example is, in fact, a wrist watch.) In this way, a process of acclimation is effected, as in the case of a watch worn habitually.

Interestingly, the role of the 'wearer' is also carried out relative to technologies that are not generally considered 'wearable.' Consider the smart phone: these devices, although not appended or connected to any one part of the user's body, are indeed worn by them—they are carried in

purses, pockets, and bags. They add weight to the personage of the user, are felt in the form of increasingly large outlines beneath the denim of jeans, and take up space in purses or bags that used to be relegated to wallets and the like. In that they are portable devices—somewhere between notepads and tablets in the terminology of Xerox PARC—they are carried; in being carried, they are worn, where the act of carrying is deferred to other items, such as pockets or bags.[130]

The Zip is not the first model of pedometer released by FitBit, but it is an early one. It was released in late 2012, roughly one year after the initial release of a FitBit tracker: the FitBit Ultra. I begin with the Zip rather than the Ultra because the Zip is the earliest model with which I have direct experience. I first purchased a Zip in the summer of 2014 and wore it in the watch pocket of my jeans for roughly the next three years, at which point I purchased a FitBit Alta HR for the purpose of 'getting to know' it.[131]

Prior to description and analyses of the videos that portray these devices, I will turn my attention to the description and analyses of those lowly objects in which these devices reside prior to use: their packaging and the auxiliary contents of their packaging. Just as emails and landing pages populated the broader text to which Intel's IoT video belonged, so too, do these cardboard and plastic bits of packaging comprise part of the broader textuality of the FitBit devices.

[130] Although this is a bit of a digression, it bears relevance for the larger arc of this research: the apparently concretized lines between emergent or emerged forms of technology are often more porous or malleable than initially thought. These devices can (and should) be understood as objects simultaneously belonging to multiple taxonomic categories. (Having been trained in Library and Information Science, I tend to think of the situation as similar to the faceted classification system developed by Ranganathan.) These taxonomic categories, in turn, deserve consideration as objects: as objects that we acclimate to, that achieve the level of infrastructure through failing to meet a cognitive threshold of activation.

[131] One might be tempted to call this an ethnographic familiarity, but that would only be accurate under the auspices of the most vague and general definition of 'ethnography'—I prefer to look at it as a phenomenological endeavor. See discussion of Van Manen in Chapter Three.

6.3.2 The Zip Packaging

If I have been successful in communicating the heterogeneity of subjects and objects that couple or bind to form a thing in the various imaginaries of IoT, then it will come as no surprise that I begin my discussion of the various FitBit models not with the devices themselves, nor with an overt consideration of the user, but with a discussion of the packaging in which these devices are sold. The impetus for this approach is found in the work of Roland Barthes.

In his somewhat controversial work, 'Empire of Signs,' (1982) Barthes engages in a critical-semiotic analysis of the role of packages in Japanese culture. I quote this analysis at length to provide the flavor of, and my motivations for, what is to follow:

> …the box acts the sign: as envelope, screen, mask, it is *worth* what it conceals, protects, and yet designates: it *puts off*, if we can take this expression in French—*donner le change*—in its double meaning, monetary and psychological; but the very thing it encloses and signifies is for a very long time put off until later, as if the package's function were not to protect in space but to postpone in time; it is in the envelope that the labor of the confection (of the making) seems to be invested, but thereby the object loses its existence, becomes a mirage: from envelope to envelope, the signified flees, and when you finally have it (there is always a little *something* in the package), it appears insignificant, laughable, vile: the pleasure, field of the signifier, has been taken: the package is not empty, but emptied: to find the object which is in the package or the signified which is in the sign is to discard it (Barthes, 1982, p.46).

My interest in these lines is primarily relates to the notion of delay, of temporal remove and postponement. A future is contained in the box, but a future that is delayed, considered, anticipated, and desired. A future of salivation and yen. But the temporal delay represented in the packaging plays another role: it is a gift wrapped for the occasion of material consumption and the enrollment into an imaginary of IoT. As with any wrapped gift, the wrapping signals a postponement. Such postponement presents as an ideal scenario for phenomenological investigation.

To illustrate, I turn to the writing of Max Van Manen and a brief discussion of Husserl's phenomenology: "Husserl's famous motto 'back to the things themselves' […] is usually interpreted as an opposition to constructions and premature conceptualizations and systematizations, and a return to the immediate data as given to us in consciousness" (Manen, 2014, p. 367).[132] Van Manen continues: "However, the problem is, of course, that the data are not unambiguously immediately given at all, and certainly not in a form that would permit the unequivocal descriptions of the so-called intentional objects" (Van Manen, 2014, p.367).

In light of these lines, the function of the package in protecting the IoT-enabled device in space and also postponing it in time presents with an air of humor: it delays the presentation of the object itself, which cannot be judged by any means other than its immediate presentation. One sees the box in a primal moment as an object with which one might couple so as to perform certain actions: I envision great structures of art produced using FitBit Blaze boxes as bricks; I envision the Blaze box as a doorstop, a paperweight, an oversized glasses case. In its overall structure, once held in-hand, I envision the opening, the sliding of an inner box from an outer box, the peeling of an orange: the affordances that arise between the subject-opener and the object-opened give rise to still another set of affordances, which, will at first exist between the subject-user and the object-used, and will ultimately balloon to contain distant webs of affordances characterizing the actionable potentials arising between third-party subjects (corporations, advertisers, smartphone GUI designers, etc.), each of which further confound any attempt to account for the 'thing itself'—the object and its immediate relationship with the subject it will claim.

[132] It is worth noting here parallel relationship of this statement with those of Renfrew and Malafouris (2010) and discussed in Chapter Two of this dissertation, wherein it is noted that things become extremely difficult to think about because they become categories rather than objects…

It becomes possible, through the combination of Van Manen and Barthes, to envision the box in which any given FitBit device arrives as a signifier not only for the imaginary of IoT into which the device it holds will throw the user, but also as a signifier for the device's place within the extant and optimistically linear historicity that defines the user's sociotechnical world: the box not only delays the appearance of the object it contains, but it delays the full colonization of the present historical *a priori* by that which lurks in the varied imaginaries of IoT. The box stands as metaphor for the relationship between the present and the future, the future as present. The act of opening is the entrance into the imaginary, the entrance into one path-dependent future of IoT wherein the subject/object dichotomy is rendered triune: a future where subject-object chimeras reside in the very space of the membrane that once (however truthfully) separated the subject from the object.

6.3.3 Iconography of the FitBit Zip Box

If our first consideration of the Zip's packaging occurred in terms of delay, the present consideration will be primarily graphical. But it is also related to the connectivity of delay. In the delay before opening the package that contains a FitBit, the subject, the human user, is reminded of the wide network to which this box connects them. One needs only hold the box and look at its graphics to understand in some small way that the device it contains expands well beyond itself into the realm of consumerism, manufacturing, and shipping. All this comes to the fore through the combination of graphics present on the Zip packaging. These graphics include two bar codes and several icons.

To analyze these graphics, I will take a cue from the work of Bruce Sterling. In his monograph, 'Shaping Things,' (which I discussed at some length in Chapter Two), Sterling (2005) engages in a thoughtful meditation on the potential forms of interactivity between subject and object relative

to a bottle of wine. This bottle of wine, as he argues, is a gadget-ized bottle of wine. For Sterling, the bottle of wine is a gadget more than an object precisely because it is technologized: that is, in acting as a container it is more than a container. It is an entry point into the greater product-based and behavioral ecology of the wine manufacturer. The wine drinker (i.e., the user) is invited to review the wine; the user is directed to the vintner's website to learn more about the wine, to read informational sites about the soil in which the grapes were grown; the user is to enroll herself into the technological ecology of the vintner via the points of entry presented on the wine bottle. The same can be said of the graphical content presented on the Zip packaging.

The FitBit Zip comes in an unnecessarily large box. (This is not surprising to anyone familiar with purchasing gadgets.) It is eight inches in length, four inches in width, and one inch in depth. The device itself is 1.25 inches long, one inch wide, and about 0.3 inches in depth. In the box, the Zip sits behind a transparent veneer of plastic, backgrounded by teal colored triangles of various hues and saturations. (See Figure 56.)

Figure 56. Front view of the FitBit Zip packaging.

Two points of interactivity are represented here. First, and most apparently, the Zip itself. But something particularly interesting occurs in relation to the device because of its containment. Although it is clearly visible through the transparent plastic that encases it, it is not itself. The plastic that encases it renders the Zip a representation of itself: it is an ideal, it is a painting in a frame (if paintings are to be 'used'). The transparency of the plastic that allows visual interaction with the Zip, but not physical interaction, frames the device in a way not dissimilar to that of a screen: we look to the future through a window that takes the form of our objects. Here, we look to a future of wearable IoT technology through just such a window. In containing a window, the box mimics the interactivity—at least in appearance—of the computer screen, the smartphone screen.

The second point of presumed, prescribed interactivity is to be found at the bottom of the box's front. There, three icons are present. These are (from left to right) "Activity," "Syncs Wirelessly," and "Mobile and Online Tools." From just a glance at the box, the proto-user is already enrolled into certain forms of behavior relative to the device. The packaging—signifying the ecology of objects and behaviors to which the Zip belongs—points to a network to which the user will belong. This network is comprised of such heterogeneous objects (and subjects) as the device itself (comprised of sensors, actuators, some glass-like substance, some silicon, some plastic, and some rubber), the smartphone or laptop or tablet that presents access to online tools, an invisible network of wifi or bluetooth or zigbee, the human body itself, as well as the vast network of programmers, admins, corporate officers and executives, advertisers and marketers that comprise FitBit, Inc and its affiliated companies.

This network is further specified via graphics presented on the side of the box. (See Figure 57.) The graphical content of the side of the box includes a list of devices that are compatible with the FitBit Zip. These include certain model iPhones and 'leading' Android and Windows devices. Minimum operating system specs are also provided for users that will interact with their FitBit data via laptop or desktop computers. A URL is provided that includes a full list of compatible devices. In ostensibly possessing one of these compatible devices, the user is enrolled into the ecology of FitBit: their *habitèle* (Boullier, 2014) becomes a point of translation, where the user's subjective world of action and ambulation is translated via a network of compatible devices and then represented in terms of those devices.

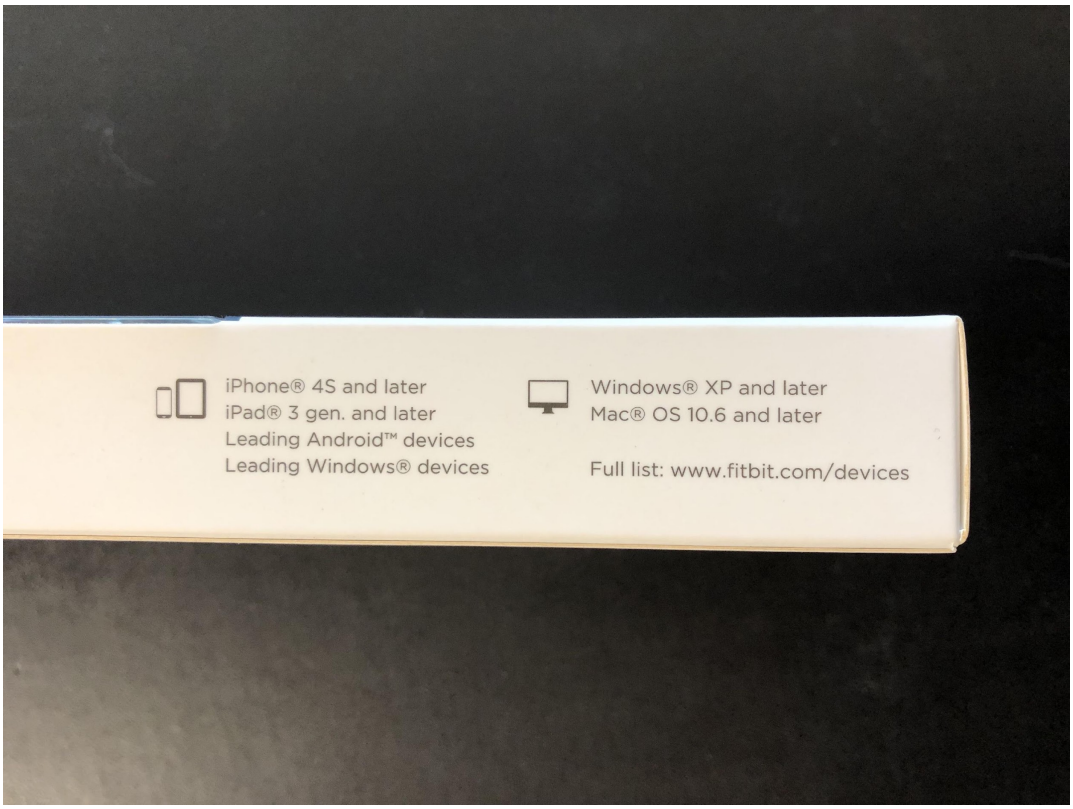

Figure 57. Side view of FitBit packaging.

These representations of connectivity—of enrollment into the ecology of FitBit devices, and into the greater ecology of IoT-enabled devices—is further expanded on the back of the Zip packaging. (See Figure 58.) Of most interest is the graphic found at the middle of the backside: a Zip is seen, communicating via the red icon of a wi-fi symbol, with a tablet or smartphone. The tablet or smartphone is just to left of a computer monitor. In this representation, we not only see the overall, user-facing objects that comprise the immediate network of the Zip as an IoT-enabled object, but we also get a sense of scale not unlike that which describes the body, the home, and the city. As was the case in the Intel video described in Chapter Five, the representation of data and analytics occurs via the inclusion of multiple colors. This data—that which is extracted through us of the FitBit device and interpreted via online tools—is an obligatory passage point: it is a pivot point through which and at which the role of the subject takes on characteristics of the object and

vice versa. Seen from the vantage of the computer—the screen that embodies and instantiates lines of code, corporate strategies, marketing, advertising, and (lest we forget) quantitative representations of the subject-wearer's daily activities—that which is represented by the computer takes on the role of the subject. It acts upon the device, and in acting upon the device, it acts upon the wearer. The wearer—the human enrolled into the technological ecology of FitBit—becomes an object, a source of extraction. The FitBit device acts as the means of extraction and acts so on behalf of FitBit, Inc.

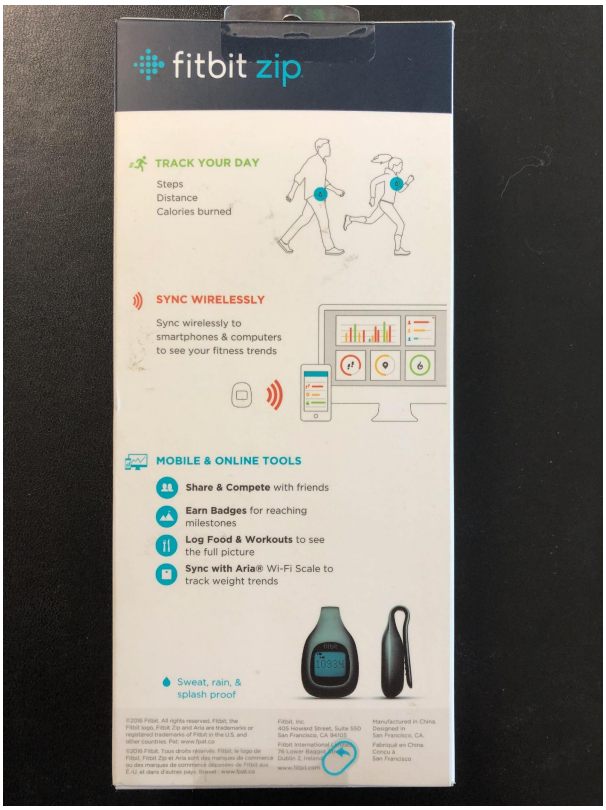

Figure 58. Reverse side of FitBit Zip box.

Seen from the more traditional vantage of the user—the human who has chosen to purchase this product and engage with it ostensibly in hopes of achieving a greater level of fitness—the world is much the same as it would be if the user were using an unsmart object. The user apparently

retains her agency, her subjectivity and acts upon the FitBit object and its screen-based extensions. But this is not a rich enough description of the network to which the wearer belongs. In that it omits or fails to account for the actants of FitBit, Inc. and its affiliated companies, it is woefully incomplete. But for these actants, there is no FitBit, no device with which to count one's steps and quantify one's fitness goals. As such, any reasonably representative network of the greater FitBit ecology includes FitBit, Inc. In so including FitBit, Inc., any representative network must characterize the user—the human that wears the device and interacts with it—as at least partially belonging to the ontological category of 'an object.' In being enrolled into the technological ecology of FitBit—into one particular imaginary of the future of IoT—the human user gives herself over. She agrees, acquiesces to a pattern of behavior that contextualizes her in terms of the FitBit ecology. She becomes an object within that ecology, whose actions are guided—perhaps nudged (Thaler & Sunstein, 2009)—in a particular way that is in-line with the data-extractive goals of FitBit, Inc. She becomes a source of data: a subject that produces data, but in producing data that is reflexively analyzed and fed back into her actions, she becomes an object in relation to the greater subject of the FitBit actor-network.

There is something—must be something—in the imaginary of IoT as it presents in the present tense that makes this kind of objectification seem reasonable, even beneficial. Perhaps this is the ostensible health benefit of achieving ten thousand steps per day; perhaps this is a symptom of the historical rise and dominance of statistics as a way of knowing and therefore controlling the world; perhaps, too, it is simply a symptom of the modern, Western human desire to have objects (Fromm, 2013), and in having objects to represent a sort of living success—a type of signifying happiness that is represented through the proxy of objects.

Each of these possibilities is rhetorical in nature. It is not difficult to trace the roots of the ten thousand step movement. It comes from Japan in the middle of the 20th century, where it was proposed that ten thousand steps per day was a means to achieving bodily health. The medical validity of this statement is dubious at best. (Moreover, it ostracizes potential users who, for example, have hip troubles, knee troubles. It further standardizes the 'standard human.') So, let's assume that it is not the actual fitness that one achieves through the act of taking ten thousand steps per day, but the appearance of fitness that is appealing—the active enrollment in a regimen, stylized and fashionable, that signifies 'health' or 'fitness.'[133]

In terms of the second framing—that of the historical rise of statistics (Burchell, Gordon, & Miller, 1991) as knowledge and therefore control—where control is derived from the feedback of statistically produced information (Beniger, 2009)—we need not delve too deep. The epistemological implications of statistical knowledge production, I assume, are not frequently on the minds of non-statisticians, non-scientists. It seems somewhat unlikely that these issues play a significant role in a user's decision to adopt and adapt to a particular technological ecology. Perhaps it can be summarized by the idea that 'numbers beat no numbers every time.' The quantification of daily activity gives a sense of purpose; it provides an archival statement, a translated and inscribed event that one can consult as if to verify that action was taken, time was not wasted, and fitness was achieved or actively sought.[134]

So, we are left with another kind of rhetoric. A kind of rhetoric that fits in with the work of Erich Fromm, who identified two primary modes of living: being and having. In the FitBit, we see an example of being through having: one not only has the device and measures the act of being

[133] Indeed, this form of signifying appropriately nullifies questions of use and non-use by FitBit owners.
[134] The nature of the archival statement will come under close scrutiny in the third part of this dissertation. For the moment, it is enough to bear in mind that the adoption of the FitBit technological ecology, through which the user renders themselves an object unto the Caesar of IoT futures, has deep and weird phenomenological implications.

through it—measuring life in steps if not in coffee spoons (Eliot, 2019)—but also has, owns, accumulates the objects of data, the representations of steps taken that appear in colorful outputs on smartphone or computer screens.

To engage with and enroll in the technological ecology of FitBit—and therefore with a particular imaginary of IoT, a particular possible transformation of the interactivity of the human archive—is to possess objects. It is to live in the mode of 'having' where the category of what is had includes the body, includes the subject. In being 'had' the subject is further transformed from a state of subjectivity to a state of objectivity: that which is had is controlled; that which is controlled has no agency; that which has no agency cannot be a subject.

Through use of the FitBit devices for a purpose as seemingly innocuous as monitoring one's pedometrics, the body-as-agentic is translated into archival statements that have no agency. The actions of the body are translated into archival representations; represented in an archive of numbers and data extracted from bodies, but an archive that is entirely without a body itself—or, perhaps, a body of Shelley's disembodied corpses awaiting reassemblage. (This then brings to mind the notion of the archive of IoT as the lab-child of a newer, more modern Prometheus: a digital Prometheus.) Data extracted from the body becomes the proxy for the body: it becomes the body-in-the-archive, but a disembodied representation thereof. In engaging with the archive in real-time through the use of a FitBit device—which, again, produces and extracts data so as to enter the body into the greater archive in real-time—the human-subject-turned-user objectifies herself. She becomes an object-like subject capable of independent action, but—assuming sufficient buy-in to the FitBit ecology—is likely to base her actions on the prosthetic sensors, the prosthetic and algorithmic analytic thought of the FitBit assemblage.

The willingness to do so must come from some other source. It must come from the rhetoric of the FitBit brand—of the way in which enrollment in this particular future of IoT is represented. As it turns out, preliminary entry into this representation is granted through the very characteristics of the FitBit iconography.

At the top of the box, on its front side, one sees a black banner with the FitBit icon and writing. (See Figure 59). This FitBit icon or logo is ubiquitous across each of the items in FitBit's product line. As such, it deserves some attention.

Figure 59. FitBit logo and icon.

The sans serif, lowercase typography of the logo, with its combination of rounded letters and ninety-degree edges, conveys quite a bit of information about the product line. The combination of lowercase type and curved slopes provides and air of playfulness, of the informal. The combination of this playfulness, however, with the presence of ninety-degree corners at the edges of the letters alludes to something more regimented. It is as if the typeface silently conveys the relationship between having (physical) fun and the discipline of maintaining one's bodily health: one plays while working out (represented by the internal motion of the letters) but one achieves fitness, a 'hard body,' once the fun has ended (represented by the terminal right angles of each of the letters).

The icon that accompanies this typeface has changed somewhat over time. (See Figure 60). In the older version of the icon, there is an arrow explicitly drawn into a square configuration of dots. As with the English language on the page, forward motion is implied by the arrow pointing from left to right. The same message is conveyed in the newest version of the icon, although it is conveyed in a subtler way. Where once stood an arrow of dots in a different color, the new icon achieves the impression of forward (left-to-right motion) by an increased size of certain dots. The effect, however, is the same.

Figure 60. An older version of the FitBit icon.

Beyond the impression of an arrow, of forward motion that is present in the icon, the overall composition of the icon is worth discussion, too. It is comprised of dots. These dots stand as visual metaphors for points of data. (A dot is, after all, also referred to as a point.) It is as if the combination of arrow and the dots from which the arrow is comprised speaks thusly to the reader: "from points of data, derived of motion, FitBit will allow you to make progress towards your health." The arrow through the dots further represents the notion of a trend.

Interestingly, the sort of progress to which the icon alludes is also a reflexive sort: not only is the user subject to progress by means of using the FitBit devices and application, but FitBit itself is subject to progress through the continual release of newer products, and the redesign of its logo. A feedback loop of forward motion exists between user and used (however these roles are assigned

across the formerly clear boundaries of subject and object). The trend of progress runs across both the user and the device. The impression of reflexive progress that is given by the FitBit icon provides initial evidence to support the longitudinal analysis of FitBit, its development and the extent to which the broader trajectory of the imaginary of IoT is represented in its progress. Such an analysis will be achieved through readings of the graphical material and physical substrates used to package the devices.

As a further means of enticing users to engage with and adapt their behaviors to the prescriptions of FitBit devices—even now my own device reminded me that I have ten minutes left to get 250 steps this hour—text accompanies the graphical content of the box. With regard, again, to the packaging of the Zip: beneath FitBit logo, beneath the plastic veneer, one sees the words:

> "zip
> Wireless Activity Tracker
> GET FIT. HAVE FUN."

The textual content of this slogan, 'Get fit. Have fun,' mirrors the graphical and typological content of the logo. It is a mixture of discipline and fun. This simple slogan presents the FitBit as a tool for enjoyment. There is no better way to obfuscate undesirable outcomes than through the mention of 'fun.'

Beneath these words, at the bottom of the box's front side, one sees three icons: a green human figure running, an orange set of curved lines that resemble a wifi symbol rotated ninety degrees, and a blue pair of screens: one smartphone and one computer. The first is described by the word 'ACTIVITY,' the second by, 'SYNCS WIRELESSLY,' and the third, 'MOBILE & ONLINE TOOLS'. In these selected icons one finds the core values of the Zip: the combination of activity

and technology, which lurches towards the disciplined fitness of the typography's ninety-degree angles.

The back of the box provides a somewhat greater depth of information. One sees at the top of the back a representation of two humans: a woman and a man. The woman has a blue circle with a black enter over her left breast; the man has a blue circle with a black center above his left front pants pocket, into which his hand is placed. Directly to the right of this pair is a blue set of curved lines that seem to move toward an enlarged representation of the screens that were presented on the front of the package. Beneath this graphic, one finds text in two languages: English and French. The English, presented above the French, reads: "Achieve everyday fitness." The French, "*Soyez en forme tour les jours*."

From here, descending down the back of the box, one sees two columns of bullet points. The left is, again, in English; the right in French. The left column begins with a blue word, 'TRACK.' Bullet-pointed items underneath read, 'Steps / Distance / Calories burned.' The only notable difference in the French corollary is the verb 'MESUREZ' that replaces 'TRACK.' Beneath this set of bullet points is another set, headlined with the words "WIRELESSLY UPLOADS," and the points: "All computers / iPhone 4S or later / Bluetooth 4.0 or Bluetooth Smart Ready devices (see side panel).

Further down the box, one finds the text 'Track progress on your dashboard, online or mobile", followed by a quartet of icons: an ***x-y*** axis accompanied by the words "CHARTS & GRAPHS;" a trophy icon accompanied by "BADGES;" a three-point network accompanied by "SHARE & COMPARE;" and the familiar two-screen icon accompanied by the words "MOBILE & ONLINE TOOLS." With the mention of badges, one finds still another means of enrolling users into their

newfound chimerical status of objective-subjects: operant condition and positive reinforcement. The bell rings, the dog salivates.

The very bottom of the box presents, from left to right, a black raindrop icon accompanied by the words, “Sweat, rain, & splash proof” and photos of the standard encasement for the Zip, built of rubber and having a clip on the back.

Upon opening the box, one finds a formed plastic tray at the bottom of the package, beneath the plastic veneer that encases the device itself. This tray holds three items: at the top right, a USB dongle; at the bottom right, a large plastic key; and on the right, the rubbery holder into which one places the Zip so as to wear it. Beneath the key, one finds a lithium battery like the ones used to power some watches. Behind this tray one finds the usual, forgettable documentation concerning ‘Safety Instructions & Limited Warranty,” and a quick start guide that guides the user to a website from which they can download the FitBit app.

For all of the novelty of this device, the experience of opening its packaging is the antithesis of novel. That is, in its packaging one finds that the Zip itself is deeply embedded in extent discourses of materialism and consumerism. Although the social imaginary that gives rise to IoT and its nascent set of assumed goals and functionalities is, indeed, populated by the appearance of novelty, such novelty (i.e., universal extraction) is subtended by extant discursive structures.

What is perhaps most intriguing about the packaging of the FitBit Zip is the inclusion of a USB dongle. At first glance, the presence of a dongle makes sense. After all, as much as the Zip is advertised or described as a tool for tracking certain aspects of one’s fitness or activity, it is also advertised as a connected device. That is, in the iconography of screens found on the product’s box, in the allusions to ‘mobile and online tools’ and the badges and charts and graphs that exist somewhere within those mobile and online tools, all refer to an underlying connectivity present in

the Zip. It may be the object that collects data—that creates data as it simultaneously extracts it—but it is midway destination of this data, somewhere in the impenetrable attic of silicon and algorithms lurking behind the dimension bending screens of devices, that does the heavy lifting before returning analyzed data to the user.

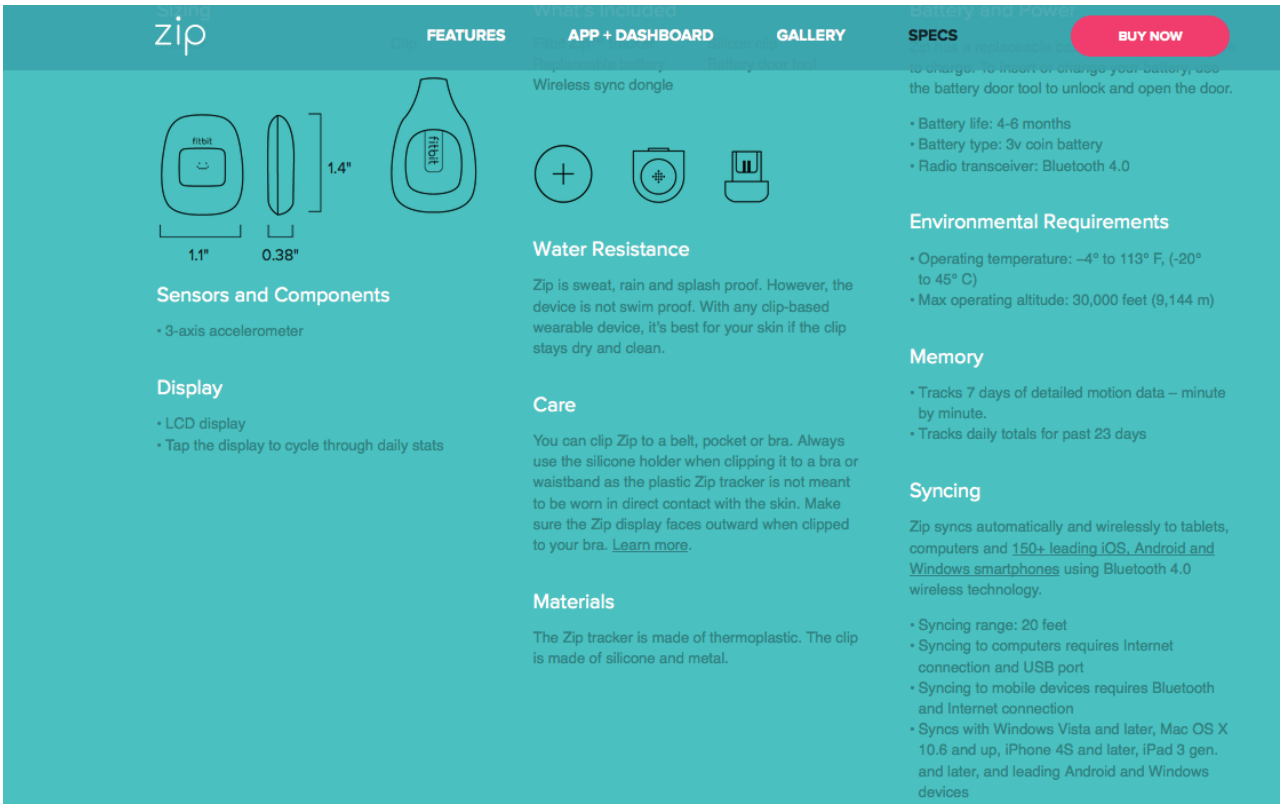

Figure 61. USB dongle included.

It is worth noting that, despite the presence of a USB dongle (See Figure 61), this is no 'standard' USB dongle. It functions as a USB device: it is the male component, and it fits appropriately into the female USB port on any given device. However, the USB trident symbol is not present on the dongle.

Figure 62. USB Trident symbol.

This illustrates the changing nature of the technologies upon which IoT is predicated. According to sections 6.5 and 6.5.1 of the Universal Serial Bus Specification (Compaq, Intel, Microsoft, & NEC, 1998), the trident symbol must be 'embossed, in a recessed area, on the topside of the USB plug' (p.81). The reasons for this specification are somewhat dubious, but can be inferred.[135]

[135] They are dubious because there is no publicly available documentation about the creation of the USB trident symbol. Indeed, as the following personal communication with a PR representative at USB-IF will illustrate, the origins of the trident symbol are mysterious:

> "The official design of the USB trident isn't attributed to a single person/designer. It was contributed as part of the USB Promoter Group work when the USB 1.0 specification was developed to designate USB ports and USB connectors. There isn't a record of the original designer and none of the participants remember clearly if one or multiple people were involved. The design of the trident is attributed to the Promoter Group as a whole. For reference the complete contents of the USB 1.0 specification including the trident are copyrighted by the USB Promoter Group. Thank you again for your email and let me know if you have questions about other aspects of USB." (Personal communication, 09/09/2015, 2:39pm)

In the context of this analysis, the unexpected absence of the USB symbol stands as a spectral reminder of the constantly changing ecology of IoT devices. In coupling with them to produce things, the subject-turned objective-subject cannot know what changes will occur relative to the ecology into which they are enrolled. To engage with IoT devices, to co-construct the 'things' in the Internet of Things is an act of faith.

Furthermore, to present oneself as an object from which data is to be extracted, and therefore entered into the disembodied archive, is to participate in an archive that is self-effacing. This, in the Derridean sense, is an archive of violence that defines itself, that solidifies its existence, through the erasure or forgetting of those infrastructures that gave rise to it.

6.3.4 FitBit Video Advertisement

The primary video advertisement—deemed primary because it is the video one encounters on the official FitBit website—is short, but it packs quite a bit of information, both visual and auditory, into its roughly one-minute duration. The video focuses on a female protagonist. She is Caucasian; she is perhaps middle-aged, somewhere between thirty years old and forty-five years old.

Prior to the appearance of the female character, the video opens with the following spoken lines: “Hard to squeeze fitness into your busy life? FitBit Zip makes fitness fun every day.” These words are spoken against a white background. The whiteness of the background is offset by four colorful Zip devices presented in a row. (See Figure 63.) From left to right, they are black, yellow, pink, and blue. The first, third, and fourth Zips are in a line slightly to the background of the yellow Zip, which is very much at the foreground of the frame. Above the Zips and in the upper left-hand corner of the frame, the viewer sees the FitBit icon (described in the previous section) along with the words: ‘FitBit zip,’ which are all lower case. The palette of the text matches the palette of the FitBit icon, where the word ‘zip’ is presented in a light greenish hue, the lettering of ‘FitBit’ is presented in black, and the dots above the first and second ‘i’ match the color of the word ‘zip.’ The black Zip and the pink zip are presented in their barest form, while the yellow and blue Zips

are depicted situated within the clasped casing that allows the user to clip the device onto an item of clothing.

A good deal of unspoken information is presented by the displays of the various Zips. (See Figure 63.) The screen of the black Zip depicts a pixelated smiley face—this is the screen one encounters when the device 'wakes up;' the yellow Zip, again positioned in front of the line upon which the others sit, presents a step count (10,934), the meaning of which is clarified by the presence of two shoe prints in the upper left portion of the device's display; the display of the pink Zip displays the distance that the presumed user has traveled (7.38), which is clarified by the presence of the 'distance' icon at the top of the display; finally, the blue Zip displays the number of calories that the presumed user has burned in the course of the day (1652), as indicated by a flame icon presented in the upper right of the display.

Figure 63. Colorful devices with data.

As the female narrator—again a narrator speaking with the clean, received-pronunciation-like diction of Midwestern America—says the words presented above, a series of three short statements are presented from left to right next to the FitBit icon: "Get Fit. Have Fun. Meet Zip.'

Shortly thereafter, as the narrator says, ‘Zip makes fitness fun every day,’ each of the Zips displayed wiggle slightly, in-time with the cheery music that serves as the video’s audio backdrop.

The frame then cuts to a scene of a woman, possibly intended to represent the narrator. She is dressed in a taupe blazer, a bright pink blouse, and is wearing a pearl necklace. Based on the barely-visible presence of a bowl and mug in the lower left corner of the frame, one assumes that the woman is at home—perhaps getting ready for a day of work, given her business-like attire. The woman takes a few steps towards the camera and the narrator says, ‘It’s small and discreet. You can wear it on your belt, pocket, or bra.’ (See Figure 64.) As the word ‘belt’ is spoken, the frame switches to a close up of the woman’s collar. She reaches beneath the fabric of her blouse—revealing an expensive looking wedding ring—to attach the Zip to her bra. Written words appear at the bottom left of the screen, each of which is presented in a grey box: “SMALL AND DISCREET’ forms a parent category from which the words, ‘BELT,’ ‘POCKET,’ and ‘BRA’ descend.

Figure 64. "Small and discreet."

The frame shifts to a scene of the woman running after a pair of young boys—her children. They kitchen is clean and upscale. It appears to be part of a house, rather than an apartment, or perhaps a large condominium. A potted tree is present at the left side of the screen, and the kitchen counters are immaculate but for the flatware evidence of a recent breakfast. As she chases her children around the island at the center of the kitchen, the narrator says: 'Zip helps you use your daily routine to get more fit.'

As the narrator continues by saying, 'It encourages you to make small decisions to move more during the day,' the viewer sees the woman, now donning an expensive looking pair of sunglasses and a handbag, walking to her car in a brightly lit parking lot, punctuated by the greenery of trees and a cloudless blue sky. The words, 'small daily decisions' are presented in a transparent text box at the upper right of the frame. She is first seen in the context of a far shot, but dissolves into a medium shot at which point she stops walking. After the dissolve, the woman is seen, Zip in-hand, tapping the screen. (The viewer does not see the woman reach into her blouse in a public place to remove her Zip.) An equals sign is then seen below the 'small daily decisions' text box, which is followed by the appearance of another: 'BIG RESULTS.'[136] (See Figure 65.) The text box that presents these words is also transparent, but is saturated with a pink color that matches the woman's blouse.

[136] It is worth noting here the presence of the presumed value of additive information. Where, in the Intel video discussed earlier, 'systems of systems' added up to yield meaning (extracted from data that was collected via each individual system), here fitness or 'BIG RESULTS' are achieved through the synthesis of multiple smaller actions. Through this comparison, we see that much of IoT is predicated on the value of aggregation; IoT is inherently scalar.

Figure 65. "small daily decisions = BIG RESULTS"

After the woman is seen in this medium shot tapping the Zip device, the frame cuts to a close up of the Zip in the woman's hand. The narrator says, 'See your steps, distance, and calories burned so you can set goals and track progress.' The woman taps along with the narrator, demonstrating what each display (steps, distance, calories burned) looks like. To highlight and further clarify the appearance of these states, a dotted line connects the green Zip to a text box that reads 'TRACK,' which is then connected via another dotted line to a second text box that presents, sequentially, the terms 'steps,' 'distance' and 'calories burned,' each accompanied by their representative icon.

Subsequent to the presentation of these functionalities, the camera cuts to a scene of the woman walking out of a Illy coffeeshop, ubiquitous cardboard coffee cup in one hand, her smart phone in the other. A circular text box is seen at the upper right-hand corner of the frame and reads, 'FREE FITBIT iPHONE AND ANDROID APPS.'

The lady in pink is looking down at the screen of the smart phone. A man in a suit stands in a line to her right (the left portion of the screen). He is followed in line by a blond woman with a grey backpack, who appears to be somewhat overweight—she is certainly larger than our protagonist. Her posture is poor, slumping ever so slightly forward. As our protagonist continues

walking out of the coffeeshop, the blond woman bends over slightly to scratch her right thigh through her pants, thus accentuating the comparatively large size of her posterior. The effect is subtle, even unfortunately humorous. The two women stand as almost polar opposites, foils in the context of this narrative: the protagonist is confident, maintains good posture, is smiling, and is productively engaged with the interface of her smartphone; the blonde woman is frumpy and publicly engaged in the base action of scratching an itch. (See Figure 66.)

Figure 66. Juxtaposition of characters.

All of this occurs as the narrator says, 'Using the free FitBit app, you can log your meals and check your calories.' In the space above the Lady in Pink's overburdened foil, text appears: '1. Log Food,' as if to draw further attention to the non-FitBit-using blonde who is now unfortunately mostly rump and rash. A dotted line connects this text to more: '2. Track Trends.' As the narrator continues ('see activity trends in your leaderboard to see how you're doing versus your friends') the camera cuts to a close shot of the Lady in Pink's smart phone. She has selected the option 'cappuccino, small, whole milk' from a list of 'common' foods that she consumes. Words continue

to appear, connected by dotted lines, beneath ‘2. Track Trends:’ ‘3. Check Leaderboard &,’ ‘4. More.’

As the Lady in Pink navigates to the leaderboard screen on her smart phone—a curiously nondescript smart phone that appears to be an older model iPhone, judging by the size of it relative to the lady’s hand—a graphic appears in the upper left-hand portion of the screen that reads ‘SYNCS WIRELESSLY.’ This text appears in a maroon circle, which is connected via dotted line to another, smaller maroon circle with a flashing wi-fi icon, and finally via the smaller circle to the Lady’s smart phone. A rectangular text box below, nestled between the Lady’s small cappuccino to the left and her smartphone to the right, containing the words ‘to computers and select Bluetooth 4.0 smartphones.’ A close inspection of the contents of the Lady’s leaderboard screen reveals something rather funny: the profile picture that appears next to the highlighted user ‘You’ is that of a dark haired, unshaven man wearing bright red sunglasses. (See Figure 67.) It is a small inconsistency to which I will return our attention later.

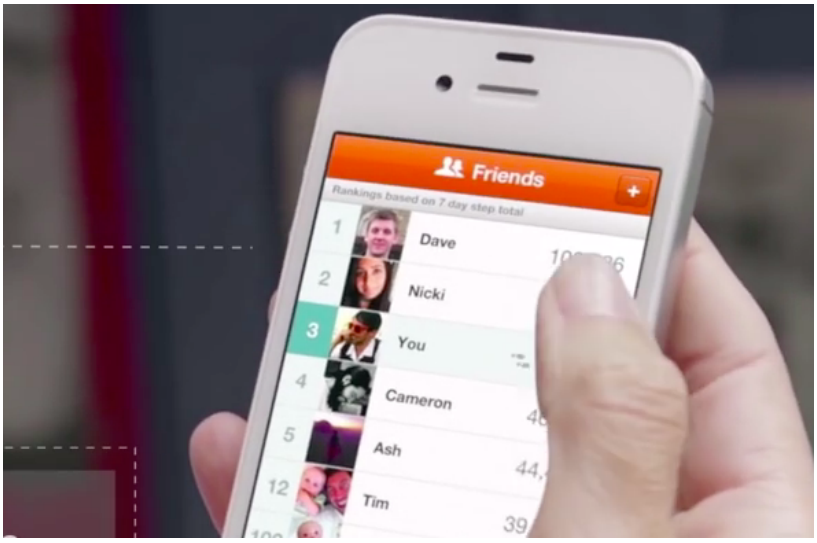

Figure 67. Inconsistency: who is 'you'?

After the narrator says that ‘Zip automatically syncs to computers and select smart phones,’ the camera cuts to an office scene. The Lady in Pink is seated at a desk facing the camera. The desk is cluttered with an Apple laptop, some paperwork, a ceramic coffee mug—our Lady clearly drinks a lot of coffee—a cylindrical mesh container of pens and supplies, and a small rectangular planter containing a few small succulents. The office behind her is not exactly bustling: a man in the background sits almost motionless in front of two monitors; another nondescript man walks in the background from left to right. The Lady is seen to reach down towards the top of a pile of papers from which she picks up her smartphone. (It is, indeed, an older model iPhone as indicated by the Apple logo on the phone’s back.) She leans in to read a message even as she brings the phone closer to her face: a dotted line connects her phone to a text box that reads, ‘Tom said: I’m passing you in steps honey!’

The camera cuts to a close shot of the smartphone’s screen. As the narrator says, ‘Connect and share with friends for a little healthy competition,’ still another text from Tom appears: ‘It’s go time! Bring it!’ Here, again, something funny happens: the text from Tom that appears in a text box to the left of the smart phone does not actually represent the contents of the smartphone’s screen. The screen does, indeed, contain a cascade of texts that moves from top to bottom with the newest information being presented at the bottom. (See Figure 68.) However, Tom does not appear in the string of updates, and some of the content seems positively out of place given that our Lady in Pink is, well, female. The first text appears from a standardized grey male silhouette. It reads, ‘Dave said: Bet you can’t catch up with me, haha!’ An alert appears below that—presented in a dark red to contrast with the light greenish-blue of the messages—‘YOU JUST PASSED DAVE.’ Dave then responds with the message, ‘Dude… That was FAST!’ A third party, Nicki (represented by a stylized grey female avatar), chimes into the exchange with FitBit’s equivalent of the early

Poke function in Facebook. A text box appears with a smiley face and the words “Nicki cheered your progress!’ The second to last message in this string is from ‘you,’ or the Lady in Pink. It reads, ‘Now it’s your turn to catch up!’ This message is followed by another box: ‘YOU taunted Dave,’ accompanied by an emoji. Nowhere in this string does Tom’s message appear other than external to the smartphone’s screen. (See Figures 68 and 69.)

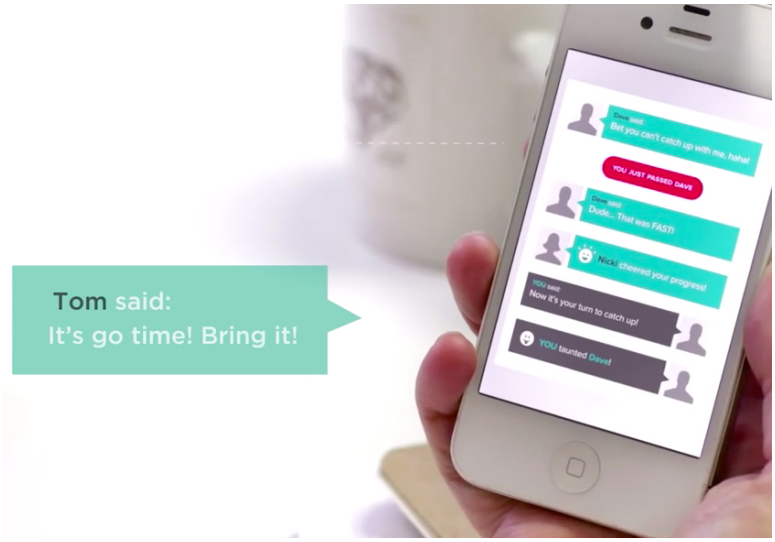

Figure 68. Inconsistency: yet another identity mix up.

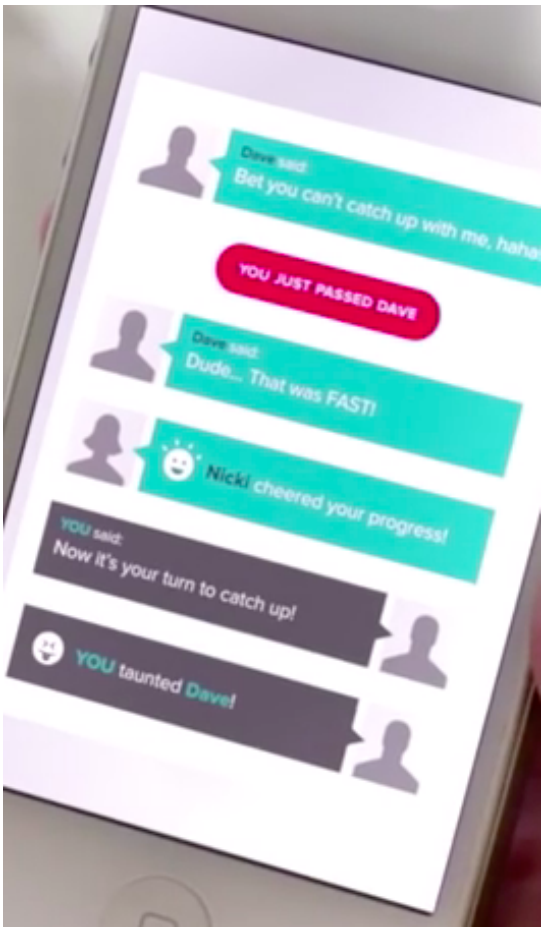

Figure 69. Detail of messages.

Despite its absence from the visible screen, Tom's message appears to have an impact on the Lady in Pink. As the narrator says, 'You can send personal messages to friend to encourage them, the camera presents a close shot of the Lady's face. She grimaces in reaction to Tom's phantom message. Text appears at the bottom left corner of the screen that reinforces the narrator's statements: 'Connect with Friends to SHARE and COMPETE.' As these words appear, the Lady in Pink rises from her desk and walks away from the camera. The frame speed increases and the Lady in Pink is seen pacing around the office amidst coworkers who appear to be actually working. As she walks out of frame a pink text box appears: 'Shannon said: Watch me move!' (It would appear our Lady in Pink is named Shannon.) As she walks back into the depths of the office

background, another message appears below hers: ‘Tom said: We’ll see tonight who comes out ahead.”

As the narrator says, ‘Get notifications when you’re near your goals,’ the scene changes. Shannon, the Lady in Pink, is seen standing outdoors in a row of four women. As was the case with Shannon’s visual relationship to the frumpy extra at the coffeeshop, The Lady in Pink stands out from her peers. (See Figure 70.) While each of the women appears to be of relatively the same weight, only Shannon is particularly well dressed. The others are wearing loose fitting clothing that bunches, or else appear with relatively unruly hair. The message is subtle but clear: Shannon, ostensibly through her relationship with her FitBit, has achieved a greater level of health and attractiveness. She stands out from her peers and the strangers she might encounter.

Figure 70. The Lady in Pink stands out again.

Shannon is seen to look at the screen of her smartphone, which notifies her that she needs to ‘Get 1,067 more steps to reach your daily goal.’ (It is also apparent from background information on her phone that she has 23 unread emails, is a Twitter user, and actually uses Safari as a web browser.) The composition of this scene is worth noting. While the primary focal point is that of

the smartphone's screen, the shot is framed in such a way as to be almost looking down Shannon's blouse. (See Figure 71.) This serves two purposes: first, it reminds the user (however passively) of the FitBit Zip that is attached to Shannon's bra; second, it further sexualizes the health-related aspects of the Zip. Although this second claim may seem strong, a sexual resonance is a logical one: Shannon is dressed in pink; Shannon is depicted as subtly more attractive than the other characters in the advertisement, who appear somewhat more disheveled than Shannon. She is the very appearance of virility as she acts on her phone's reminder, running as she does in the next frame in a field with her children, kicking a soccer ball with them.

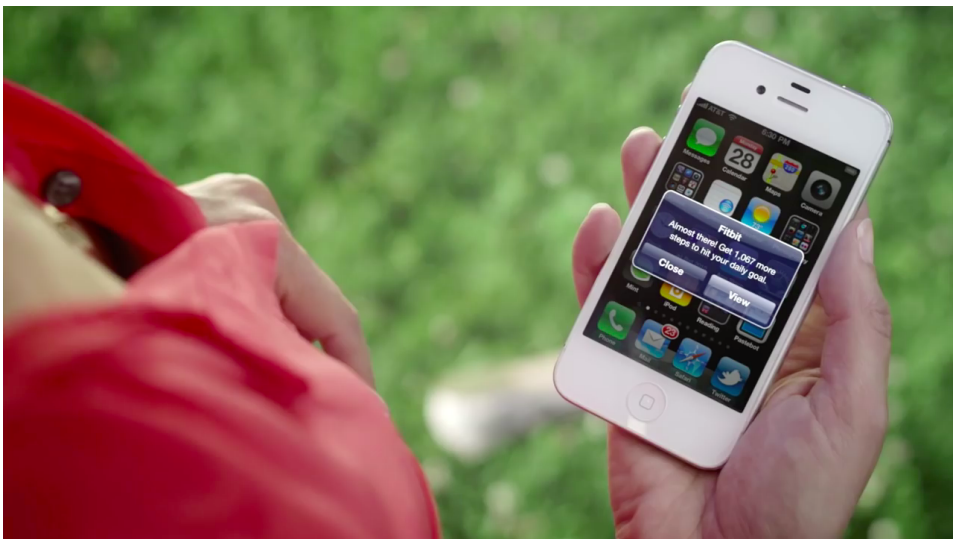

Figure 71. Small and discreet.

As the narrator continues by saying, 'and celebrate when you reach [your goals],' Shannon is seen (from a vantage just above her right shoulder) laying in the grass. She is holding her smartphone out before her as one might picture the canonical college coed to hold a book in the quad. There, amidst the clover and grass, she reads an update that tells her she has hit her 10,000-step goal for the day. (A text box appears at the bottom right corner of the screen that reads, 'EARN

BADGES FOR DAILY, LIFETIME FITNESS ACHIEVEMENTS' from which a pink footstep icon emerges.) For a split second, the camera again provides a different vantage, and Shannon is seen enthusiastically high-fiving one of her sons, who also happens to be sprawled on the lawn. As she does this, additional badges appear above the text box. One seems to indicate that Shannon has walked a total of 750 miles since she began using her Zip. The other is much less clear, comprised as it is of two overlapping clouds.

We then see Shannon jogging towards the camera in a residential neighborhood full of deciduous trees and purple flowers. Circular graphics appear that reinforce the narrator's next statements: "Zip is splash, rain, and sweat proof.' It is worth noting that Shannon does not appear to be very sweaty, nor is it raining, nor is she engaged in any way with any visible water…

In yet another cut, the viewer sees a green Zip held next to a MacBook laptop. A white dotted line emerges from the Zip and connects to a circular graphic that reads, 'SYNCS WIRELESSLY.' The narrator echoes this information by saying, 'It wirelessly syncs with your free online dashboard so you can track your activity trends, log food and workouts, see what badges you've earned, and see how your friends are doing.' As the words 'free online dashboard' are spoken, the camera shows a close up shot of Shannon smiling—brown eyes, pink lipstick, diamond earrings, and beauty marks—at her laptop screen where she engages with the FitBit dashboard. Once again, close inspection reveals that she is not, in fact, interacting with her own dashboard or information, but rather the dashboard and information of a dark-haired man wearing red sunglasses, who now appears to be named Ryan. (This is probably for the best, anyway, because the dashboard she is looking at indicates that Shannon has not actually met her daily step goal of ten thousand steps, even though the viewer has seen her celebrate this achievement with her son earlier.)

As Shannon acts out the narrator's words ('see what badges you've earned') the viewer sees a close shot of not only Shannon's FitBit dashboard on her laptop screen, but also her overall desktop. (See Figure 72 and Figure 73.) In a moment of postmodern oddness, the viewer can discern several files on the desktop that appear to reference the creation of the video that is being watched: 'notification_badge.png,' 'FitBit_Zip_Product_…N.jpg,' 'ZIP_QR.ai,' 'ONE_QR.ai.' In the Finder window of her laptop, one also sees that a disk named 'Design Files' has been mounted.

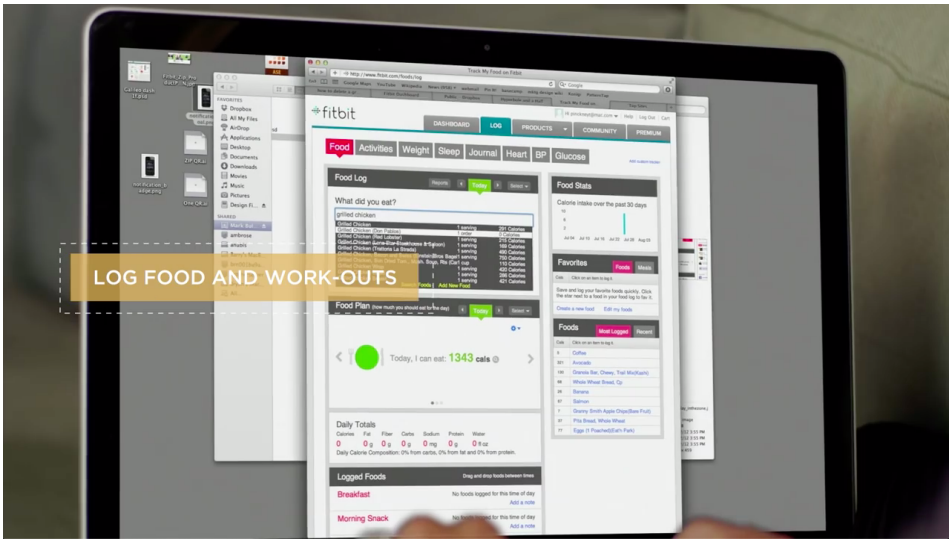

Figure 72. "Log Food and Work-Outs."

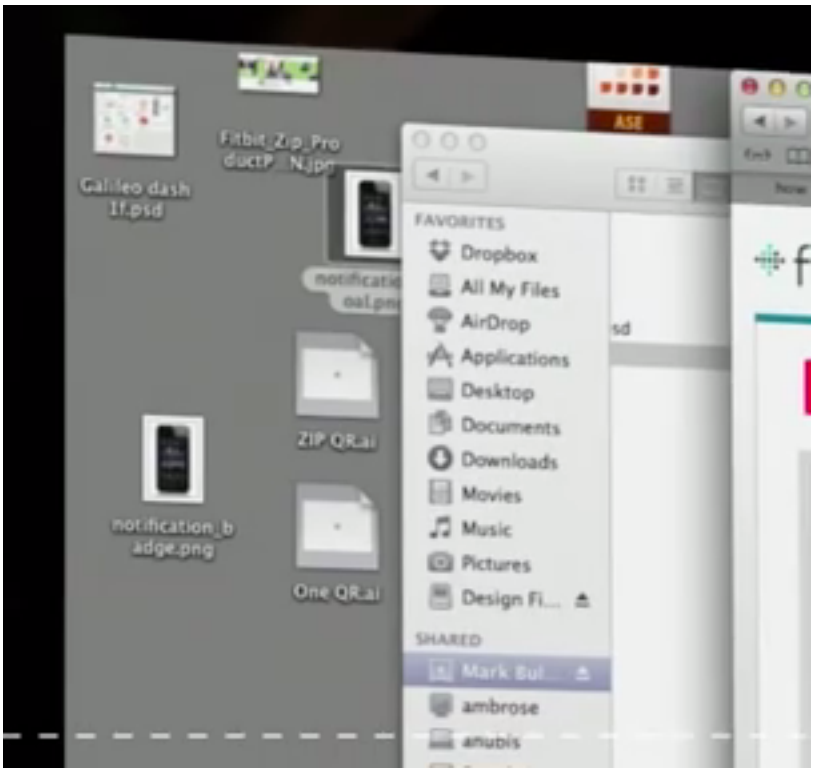

Figure 73. Detail showing FitBit ad materials on desktop.

Once Shannon has demonstrated that one can view the badges they've earned, belonging to such categories as 'Daily Steps,' 'Daily Climb,' 'Lifetime Climb,' 'Lifetime Distance,' and 'Weight'—it would appear that Shannon has lost 30lbs since becoming a FitBit user—the camera switches to a more human scene. We see Shannon and a man, probably Tom, sitting near one another, leaning in towards each other to view the readout on each other's Zips. A closeup shot reveals that Tom has gotten 10002 steps during the day, but that Shannon has only gotten 9979 steps. (Poor Shannon that she lives in a universe of such unpredictable temporalities that one minute she's reached her goals and another moment she has not, damned like Sisyphus to walk and walk and walk at the whims of some greater pedometric God!)

As the narrator says, 'Turn everyday life into an awesome path to fitness,' we see Shannon, dressed in her jogging outfit, sitting alone on the couch as Tom walks off screen into the depths of

the house (lit now by floor lamps to indicate the close of the day). The smile on her face fades into a look of consternation. A medium shot of the living room reveals her hopping up off of the loveseat upon which she sat and race walking in circles around the room. (The frame rate decreases to emphasize her walking.) As she paces, her neon green Zip appears in the bottom right hand corner of the screen and counts up quickly from 9979 steps to 10005. Upon reaching 10005 steps, Shannon fist pumps and the scene closes.

The video ends with a white screen. The FitBit logo is present, as are the words 'FitBit zip' that opened the video. A blue Zip is seen from the front and again in profile. The narrator says, 'Get Fit. Have Fun. With Zip.' As the narrator says these words, the statements 'Get Fit. Have Fun. Meet Zip' appear at the top of the screen in a somewhat egregious bit of copy-writing inconsistency. As I will demonstrate, the presence of inconsistency warrants further discussion.

The most notable aspect of this video—aside from its subtly sexist connotations, which in and of themselves, indicate that the futures of IoT do not contain panaceas for cultural or societal woes, but instead might be predicated on them—is the interaction between Shannon and her Zip. (Perhaps this is not surprising.) By this, I mean the extent to which Shannon, in looking at the various graphical, numerical, and textual outputs related to her Zip, seems to be chasing a future self. In acting through and by means of the thing she co-constitutes, she steps towards herself as she is constructed in the realm of the technical image: she is stepping towards herself even as 'herself' is designed and nudged by the Zip that, in demonstrating qualities of a subject, acts upon her to extract data. As we will see, this will be a continuing point of interpretation for videos representing IoT at the scale of the body.

6.4 The FitBit Alta HR

6.4.1 FitBit Alta HR Packaging and Iconography

Like the Zip, the FitBit Alta HR, released in 2017 some five years after the Zip, comes in a large box. In fact, the box is of the same dimensions as that in which the Zip is packaged. This, however, is just about the end of meaningful similarities, aside from the packaging's over all form—it is cardboard with a lot of graphical and textual content printed on it.

The Alta HR's packaging is more nuanced. (See Figure 74.) It is comprised of a box within a box: the inner box opens with some little force, being magnetically closed with a flap; the outer box is a shell or sheath that slips over the inner box. It is just shorter than the inner box such that the turquoise color of the inner box peeks out from the bottom of the outer sheath. The front of the shell is largely white, with a subtle difference in tone halfway down the length of it. The top of the box, as in the case of the Zip, contains a banner text with the FitBit icon, and the model name. This difference in tone gives the impression of ground and a background in which a black Alta HR is floating. It reads a time of 12:49 and a heart rate of 67 beats per minute. To the right of the image of the Alta HR is a red heart rate icon under which one finds the text, 'PUREPULSE / HEART RATE.'

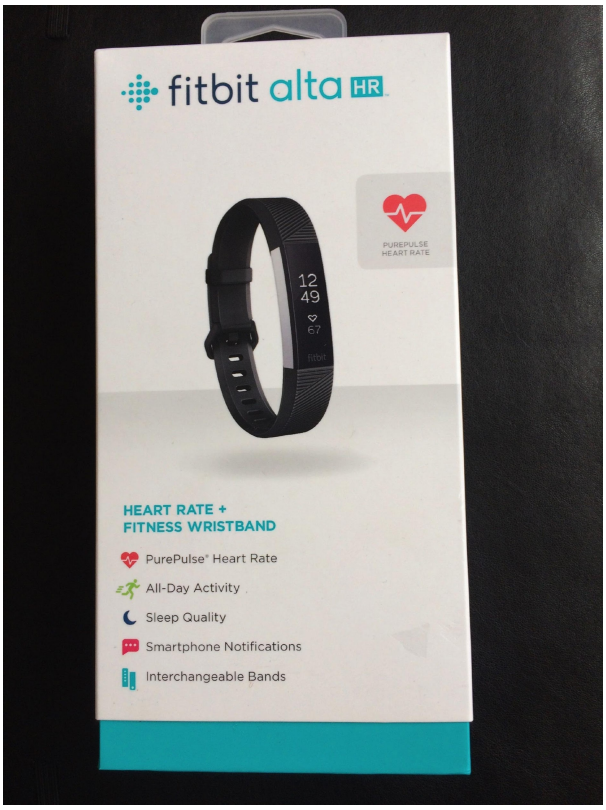

Figure 74. FitBit Alta HR packaging (front).

Beneath the image of the Alta HR, in the left lower quadrant of the package's front, turquoise print reads: "HEART RATE + / FITNESS WRISTBAND." Five icons and descriptions are provided below this heading: a smaller version of the red heart with an ECG reading running through it accompanied by the text, 'PurePulse Heart Rate;" an icon of a green person running with speed lines emanating from his back, accompanied by the text, "All-Day Activity;" A dark blue crescent moon icon accompanied by the text, 'Sleep Quality;' a text box icon accompanied by the text, 'Smartphone Notifications;" and an icon of two wristbands accompanied by the text, "Interchangeable Bands."

It is a sleek front cover that draws the eye to two primary areas: the upper right with the icon of the heart, and the lower left with the list of icon-accompanied text. For this reader, at least, the image of the actual device that appears towards the center of the box does not draw the most

attention: it is already generally known what is in the box. (Something, after all, brought the user or the reader to the state of possessing the box, of holding it. Ostensibly, that something was the desire to own a FitBit. As such, it is already apparent that a FitBit is in the box.) As with the device itself, then, the areas of interest that arise from the device do not do so in the form of the device, or at the device's location: rather, the areas of interest arise in the device's peripheries. They arise from the extent to which the device interacts with the spaces around it, whether that takes the form of a wearer walking around their neighborhood or descriptive icons and text breaking up the bitonal whites and grey of the area in which the device is graphically suspended.

The back of the box comprises an expansion by way of description of the materials depicted on the front of the box. (See Figure 75). The same FitBit logo and Alta HR iconography is present; however, on the back of the box the logo and text are accompanied by a slogan below it: "Move to the beat of you."

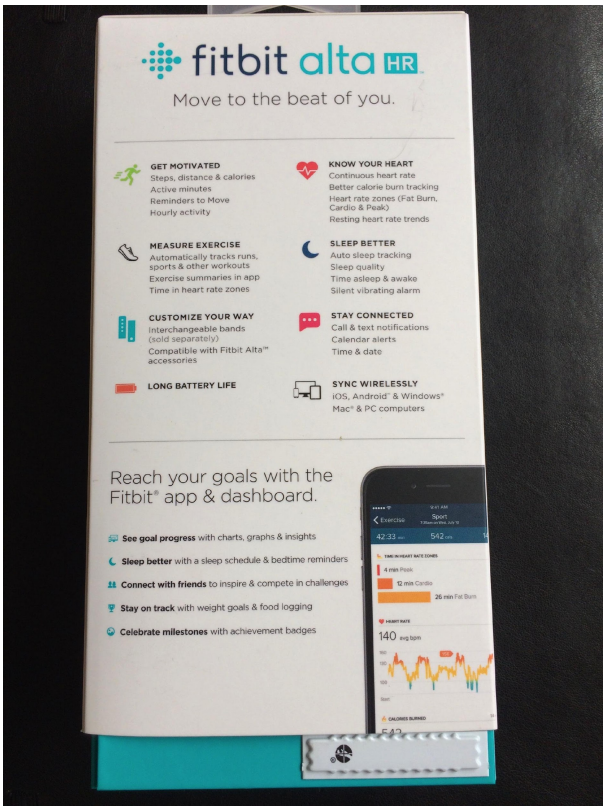

Figure 75. FitBit Alta HR packaging (reverse).

This is an interesting slogan, to say the least. To demonstrate its interesting qualities, I'll dissect it. We begin with the first word, the verb: 'move.' It is perhaps unsurprising that the slogan begins with a word referring to motion—the FitBit is intended to track such motion. That the potential user moves 'to' something provides a sense of directionality; it also provides a context. Expanding the sentence to include the first four words, 'move to the beat,' further provides context. One is immediately reminded of the phrase, 'dance to the beat of a different drummer.' With the inclusion of 'beat' and its modification by way of the definite article, 'the,' the reader becomes aware that it's not just any beat to which the user will move. Instead, it is a specific beat, and one that is likely derived in some way of the device contained in the depths of the packaging.

The use of the term 'beat' is an apparent double-entendre. At once 'beat' is a signifier having as its referent the beat of the heart — this is, after all, the Alta HR that measures heart rate. But the idea that this beat occurs in relation to movement indicates some relationship to music, to dance. There is something about the potential relationship between the user and the device that allows the act of 'mov[ing] to the beat of you' that resonates with the deeply personal and emotional experience of music. This is, indeed, a multi-layered slogan. It will receive more detailed discussion in the subsequent section.

'Of you' constitutes the final unit of the sentence. The reader, the potential user, is drawn into the semantic world of the slogan by its inclusion of an (implicit) direct address. Given the slogan's apparent resonance with the phrase, 'Dance to the beat of a different drummer,' one finds a deep-seated notion of individuality lurking behind the word 'you.' But this apparent individuality is paradoxically complicated. As a pronoun, 'you' is intrinsically linked to that signifier's referent: 'you' is *the* individual on the other side of a communication. But 'you' is also *an* (indefinite)

individual on the other side of a communication. Immediately, a blur between the definite and the indefinite states of 'you' becomes apparent. It is as though the user will achieve some greater individuality (as in the 'different drummer') by moving with and alongside the contents of the package, but in doing so, they will be accompanying myriad other 'you-sers' in the same process of individuation. There is uniformity in this individuality, a uniformity achieved by the coupling of user and device in the process of individuation, so as to individuate.

As this slogan, 'Move to the beat of you,' occurs also in the video advertisement for the FitBit Alta HR, it will receive more substantial discussion and analysis in the sections that follow. For now, it is enough to bear in mind the complications that arise from the use of 'you.'

Perhaps the most intriguing aspect of the Alta HR packaging is the box within a box. Whereas the FitBit Zip is packaged in only one box, the Alta is packages in two. Given the temporal difference in release dates, which must be read in terms of the evolution of IoT—the design, production, and consumption of IoT-enabled devices such as various FitBit models—it is worth examining the rhetoric of this box within a box. I will do so now via the notion of the system of systems described in Chapter Four.

IoT, as we have seen, can be broadly described as a system of systems from which some form of intelligence emerges. This was the primary message of the Intel video analyzed in Chapter Four. But this nesting, these systems within systems, deserve scrutiny not only in terms of the emergence intelligence to which they give rise, but also in terms of their conceptual structure. As more systems combine and network with other systems, intelligence is ostensibly increased; so, too, however, is the depth of the vision of IoT. By depth, I mean not only the ubiquity of IoT in terms of device proliferation, but in terms of IoT as a window through which the world is known—a map that becomes the world.

As with a labyrinth, wherein the wanderer or explorer loses their bearing relative to the world outside as they progress further into the labyrinth, the depth of these systems of systems obfuscates the world that might exist without these systems. The box within a box, then, might be interpreted as a manifestation of the depth that IoT has already achieved: where the external box represents the broadly defined realm of IoT; the internal box represents the further evolution of IoT, the proliferation of devices as well as the nesting notion of systems of systems. This approach—highly interpretive though it is—also sheds light on the import of the screen that constitute the Alta HR's GUI. Through the nesting of the physical world in terms of the IoT, one ultimately reaches *the* physical metaphor for knowledge production—for the act of being in the world—at the heart of IoT: the screen. We unwrap and unwrap and we are met with not a purely physical object, but a physical object that takes on characteristics of a crystal ball. Through this crystal ball, this display, this screen, we see the potential worlds of IoT: representations of data that has been extracted via the use of the device the packaging contains. In the act of unwrapping the Alta HR, the subject (soon to be turned user, and still later to be turned subject-object) unwraps a future wherein the physicality of the world is funneled through the visual pathway: through both the image-as-object and the technical image that resides just beyond the physicality of the medium.

6.4.2 FitBit Alta HR Video Advertisement

The video advertising the features of the FitBit HR (HR stands for 'heart rate') takes a somewhat different form than that of the Zip video. This particular video has no voiceover, relying instead on written text that appears on the screen alongside the somewhat disjointed narrative of the video. The overall effect is something approximating a hasty poem—one without meter,

rhyme, or written structure, but one that relies on the interplay of written words and sentence fragments with the visual and audio characteristics of the video it accompanies.

Given the format of this video, then, my discussion of it will take the following form: I will present a line of text from the video (e.g., ‘Live healthier’) in bold; this line and all others will then be followed by paragraphs of prose that describe and analyze what is occurring in the video. I provide the full text of this advertisement-video-poem presently, along with line numbering.

FitBit Alta HR

Our slimmest wristband with heart rate
Live healthier
Know your heart
with PurePulse heart rate
Reach your weight goals
with more accurate
calorie burn
Push your fitness further
with heart rate
zones and trends
Get credit for your workouts
with automatic
exercise recognition
insights to help
you sleep better
Stay motivated
All day
tracks steps,
distance and calories
interchangeable
bands
motivates you to move
Connecting you with what matters
call, text and
calendar alerts
Move to the beat of you
FitBit Alta HR
our slimmest wristband with heart rate

In presenting this text, I have remained true to the punctuation and capitalization of the letters and words that comprise the video's text. I make a point to note this because, at first, these aspects of the text appear almost haphazard.

6.4.3 Line by Line Analysis

FitBit Alta HR / Our slimmest wristband with heart rate

The video opens on a grayish white screen that gives the impression of a live photo studio with multiple sources of light focused on the center of the frame. A FitBit Alta HR, black, slides through the air, rotating clockwise until it reaches a resting place at the far right of the screen. When it stops, the full band, as well as the band-width interface is visible to the viewer. (The interface-screen displays a heart rate of 64 beats per minute.) As the device reaches its stopping point, still slowly rotating to face the viewer but no longer laterally mobile within the frame, the first portion of the text appears. The word 'FitBit' (all in black—a subtle difference from the presentation of the word 'FitBit' in the Zip video) appears to rise from nowhere alongside a variation of the FitBit icon. This time, the icon is monochromatic, relying only on the side of the dots that comprise it to give the impression of a left-to-right pointing arrow. The icon is presented in the standard greenish blue hue, as are the words 'Alta' and 'HR' that appear, as if sliding, emerging from behind the text 'FitBit.' Simultaneously, another line of text is presented: 'Our slimmest wristband with heart rate'. This secondary text is presented in a dark grey hue, differentiating it from the boldly saturated hues of the text above. All text is conveyed in a sans-serif font.

The choreography of text and image is supported by the swell of a musical instrument—the swell gives the impression of a reversed delay effect, although the exact instrument or combination of instruments used to achieve this effect are unknown. It seems likely, however, that the sound was designed artificially (beyond the unnatural reverse swell). As it crescendoes towards its originary formant, a piano strikes a note. It is with this acoustic declaration that the camera cuts to a second scene.

Live healthier

These words appear left-center in the frame. They are white, standing in contrast to the scene behind them: the grandstands of what could be interpreted as a university stadium. The grass at the center of the stadium is visible, as is an unlit scoreboard. The bleacher seats are empty; the apartment buildings visible in the distance appear lifeless, too: no lights are on in the windows. The lights, however, at the stadium are illuminated against the fading light of day. (The sky is brighter at the left side of the frame, giving the general impression of the sun setting in the west, while a darker blue approaches from the right.) Trees populate the otherwise dead space of the frame. One can almost feel the coolness of evening humidity.

A runner—a fit woman—sits upon the track that surrounds the field. She is stretching her right hamstring: her right leg is extended, flat with the ground; her left leg tucked in, sole touching above the knee of her right leg; her body bends toward her right foot; her fingers nearly meet as they grasp either side of the sole of her right shoe. She is wearing tie-dye purple leggings, grey shoes, and a grey shirt. Her blonde hair is tied tightly in a pony tail. On her left wrist, an orange FitBit

Alta HR is visible below the taught tendons lining the top of her hand. The language of this scene has a clear point: this is a serious runner; the FitBit Alta HR is suitable for such a serious runner.

But the added textual language is inclusive, rather than exclusionary. The comparative form that 'healthy' takes in 'healthier,' creates a space for improvement. Such a space ostensibly includes potential FitBit users who want to attain the remarkable level of fitness displayed by the archetypal runner central to this scene. More than that, the combination of 'live' and the comparative form of 'healthy' performs an interesting reduction: the infinitive (to live) is remarkably broad in its nature. In its broadest sense, it could refer to autopoiesis. But such broad interpretation, like marble in the hands of a sculptor, is chiseled away to reveal something smaller, something much less inclusive. To 'live healthier' is to be physically fit. This semantic reduction stands in stark contrast to the double-entendre of the next scene.

Know your heart

The next short scene cuts to a close shot of the runner's left wrist, which bisects the frame at something approaching a forty-five-degree angle, the bulge of her ulna giving way to her downward slanted fifth metacarpal near the center of the frame. The words 'Know your heart' appear at a slant that matches that of the runner's arm.

The same orange wristband and device are seen on her wrist and forms an angle slightly greater than ninety degrees with the written text. The device's readout includes, from top to bottom, a simply drawn heart symbol and the number 64 below it. If the ease with which our runner stretched her hamstring was not evidence enough, such a low (presumably) resting heart rate is further evidence. But this is where the semantics of 'Know your heart' resonate across multiple registers.

To know one's heart echoes with the (often misinterpreted) humor of Polonius and the classic rock anthems of Tom Petty and countless others who have instructed their listeners to 'listen to [their] heart.' To know one's heart does not, in a general sense, mean that a person should pay close attention to or study the functionality of the heart as a muscle. Instead, it carries an emotional tone, an experiential tone. To 'know your heart' is to be familiar with and to abide by the emotional tendencies one has. In this context of this short scene, however, 'Know your heart' must be interpreted as doubly meaningful.

As the words hover near the runner's wrist, the music continues to swell in its reverse fashion. Another strike of the piano (moving from the IV-chord to the V-chord—the most common means of setting up a return to the I-chord in Western popular music) a change of frame.

with PurePulse heart rate

With an ascending resolution from the V-chord to the I-chord, the camera cuts to a reveal the words 'with PurePulse heart rate' running between the top of the track and the now-central bandstand and scoreboard. (The shot is reminiscent of Wes Anderson in that it relies on over symmetry.) Just after the words appear with the change of scene, percussion is added to the soundtrack, reinforcing the language of 'PurePulse.' The viewer sees our runner, pony tail flying behind her head, running with perfect form from left to right on the track in graceful slow motion. The overall impact is one of some small euphoria, of a physical state of flow.

As the runner approaches the center of the frame, as splice cut reveals a male bicyclist maintaining the rightward trajectory of the runner, but now placed in front of a grey building, an empty and rain-slicked parking lot substituted for the reddish clay of the runner's track. The

stadium is gone, the workaday world has appeared in all of its paved grays, reflective office windows, and urban infrastructures.

The shift in color scheme and scene carry an important message: the FitBit Alta HR, while clearly suitable for use on a track while running, is also suitable for use while bicycling to a contemporary vision of work, the rider laden with both juvenile backpack and mature leather wingtips. As the bicyclist reaches the rightmost portion of the frame, the camera again cuts to another scene.

Reach your weight goals

A close shot of a bicyclist's legs pumping on either side of a bicycle frame, blue and green respectively, appears amended by the words 'Reach your weight goals,' and is quickly replaced by another close shot of a male bicyclist—this time in a clearly different part of the urban landscape—riding past a Chinese food restaurant. A slovenly looking man stands briefly in the restaurant's entryway; our bicyclist rides confidently past, strong jaw, fashionable baseball-style helmet, and water bottle visible in his backpack. A Haagen-Dazs sign sits on the sidewalk beneath the restaurant's neon signage, ignored. The juxtaposition of managing one's weight with the rider's proximity to the Chinese food restaurant needs, I think, no further explication.

with more accurate

calorie burn

These words appear as the bicyclist continues his trek beyond the temptation of Chinese food, as a close shot reveals a black Alta HR wristband, the display of which, indicates that the bicyclist has burnt 1,827 calories so far that day. The text ‘with more accurate / calorie burn’ appears alongside a flame icon, further solidifying the semiotic relationship between that icon and its meaning.

Push your fitness further

The scene now changes to an interior shot of a dance studio. The floors are wooded, the walls old, the windows unburdened by blinds or drapes. It is a clean room, but a room that comes with the smell of socks and sweat, of water bottles and perhaps neighborhood art classes. A close up of a female dancer—brown curly hair cut just above the jawline, clad in a grey top, tattoos slightly visible on her right wrist—now fills the screen. She leaps in front of a window, bathed in grey light, backlit and magisterial. A purple Alta HR band on her left wrist provides the only splash of color in the frame.

The camera quickly cuts to a medium shot of the dancer, the room now very clearly a dance studio. The dancer leaps and twists from the left portion of the screen to the right, ending in a backwards bend, moving in front of the text ‘Push your limits further’.

with heart rate

zones & trends

As the dancer lands her leap, the viewer sees yet another close shot of a device. This time, however, it is the dancer's smart phone held in her left hand, the band of her Alta HR just barely visible at the bottom of the frame. As indicated by the text 'with heart rate / zones & trends,' which is accompanied by an icon comprised of a horizontally oriented bar graph and heart, the dancer is using the output of the FitBit app on her smartphone to analyze or better understand the intensity of her workout. (This in and of itself brings up some interesting issues: that the intensity of a workout is ostensibly better understood through the externalization of data pertaining to that workout serves to divorce the very body that is exercising from the judgment of the quality of the exercise. This divorce creates a feedback loop between the subject-dancer and the constellation of IoT devices that comprise engagement with FitBit such that the 'thing' created is a chimera of subject and object where physical, corporeal boundaries of the dancer become more porous than they would be in the absence of this externalization.)

The readout on her smart phone indicates that she has perfect cell reception, a strong wifi signal, and it is 9:41am. Her workout, identified automatically as a session of 'Aerobic Exercise' began at 7:35am on Wednesday, July 10. Her exercise session lasted 42 minutes and 33 seconds, during which time she burned 542 calories, and maintained an average heart rate of 140 beats per minute. Four minutes of her workout were spent at peak heart rate, 12 minutes in the cardio zone, and 26 minutes in what FitBit refers to as the 'Fat Burn' zone. All of this information is presented in at least two graphical forms.

As with the overlap of screens and narrative found in the Zip video, discrepancies are found in this instance, too. The initial discrepancy is found between the time displayed on the phone, the listed duration of the dancer's aerobic workout, and the time at which her app indicates she started her workout. That a jump cut is used to transition from a medium shot of the dancer to a close shot

of her interacting with her smartphone indicates that little to no time has elapsed between the workout and the point in time at which she checks her stats. Yet, the app indicates that her workout lasted 42 minutes and 33 seconds and began at 7:35am on a Wednesday morning (July 10).

Pedantic though it may initially seem, this sort of discrepancy in the treatment of time says something quite specific about the configurability implicit in IoT: the rigidity of a well-accounted-for timeline seems to give way to the sort of massive configurability between subjects and objects that resides within the various imaginaries of IoT. That is, by means of having access to data—data above all else!—it seems that the actual, experienced temporality of the lived world, of the human umwelt, takes a backseat to the captured, inscribed and concretized data that is presented through an application and is intended to be representative of events that happened in experiential time. (This logic echoes one of my favorite one-liners about academia: 'Being an academic is great because you get to choose which 80 hours you work in a week!' It is as though the order in which those eighty hours occurred doesn't matter so long as they did.) In this temporal discrepancy found in this momentary perusal of fitness-related data, we are given a glimpse as a functional interpretation of time: the specifics of 'when' do no matter so much as long as one can say they did something. We might also argue that this new casualness of timelines is mirrored by that fact that the dancer is checking her workout stats at 9:41 on a Wednesday morning, indicating (again by way of the logic of the jump cut) that she is not at work, or does not work in a field that keeps bankers' hours or even, possible, an office.

Get credit for your workouts

Another jump cut brings the viewer back to our bicyclist. He is still riding; it is still raining. He is riding towards the camera, presumably on his way to work. As he gracefully begins to dismount the bicycle while it is still in motion, the camera cuts again.

with automatic

exercise recognition

The viewer sees a close shot of the bicyclist's right hand holding his smartphone. The textual portion of the screen is accompanied by an icon comprised of a male figure running next to a plus sign. The display on his smartphone indicates that he has worked out three out of five days 'this week, ' and that those workouts totaled to one hour and twenty-seven minutes: during the ride he has apparently just ended (which registered as 'Outdoor Bike,' he rode for 26 minutes, burnt 122 calories, and achieved an average heart rate of 110 beats per minute. He spent 87% of this time in the 'fat burn' zone. Similar descriptives are given for Tuesday's workout, although on Tuesday he ran.

Again, we find some interesting oddities in the display. On Monday, he walked at 8:57am; on Tuesday he ran for 31 minutes beginning at 8:28am; on Wednesday he rode his bicycle for 26 minutes at 8:12 am. If he has worked out for a total of 87 minutes, this means that he walked for exactly thirty minutes on Wednesday. It does not take Sherlock Holmes to detect the oddity here: our bicyclist is presumably biking to work on a Wednesday morning, leaving his house at 8:12am. The prior morning, a Tuesday, he goes for a run at 8:28am; the Monday prior, he went for a thirty-minute walk at 8:57am. Four possible explanations for this scheduling weirdness exist: (1) the bicyclist is not, in fact, going to work on his bicycle (but then why the combination of leather

loafers and backpack); (2) the bicyclist is going to work, but his schedule is variable (but not so variable that he travels by foot or by bicycle for about a half an hour every morning between 8am and 9am); (3) on each of the three days he was, indeed, traveling to work and he does not care about showing up to his desk or office a sweaty mess; (4) the bicyclist, like an IoT-enabled object itself, is always connected to the network of subjects and objects that comprise the ecology of his employment. Given all of the options, I tend towards the fourth. I will return to this assessment in the summary section of this chapter, but for now I will say this: the temporal discrepancies present in this brief scene (possibly indicative of the media manager's notion of temporality) indicate that the human subject when coupled with IoT-enabled devices, takes on certain qualities of an object. That is, by way of coupling with IoT devices—even in the relatively unexpected sense of a fitness device and app—the human user is redefined as a subject-translated-into-object by way of the devices s/he uses and the other subjects and objects who/that are also connected to that particular techno-ecology. Just as we saw that Ashton's view of IoT (see Chapter Two), when taken to its extreme, evidenced a chimerical set of objects, so too does the lowly FitBit evidence a chimerical set of subjects that arises from a network of IoT-enabled devices.

But the show (and video) goes on.

Another jump cut is effected, and the viewer is greeted by a close shot of a woman's face. She appears to be supine, her eyes half closed. (She is clearly, however, wearing makeup—mascara, eyeliner, and some kind of base on her skin.) As her eyes open further, the camera reveals her rising from bed, still half under the covers, to reach towards a bedside table. She reaches with a hand and wrist that is adorned with an orange Alta HR band. She grasps her smartphone and bring it near to her face.

insights to help

you sleep better

A close shot shows her holding her smartphone with both hands (one that is adorned by a gold wedding band). The text ‘insights to help / you sleep better’ appears next to a moon icon at the top left portion of the frame. She is viewing an analysis of her sleeping patterns for the last week. (She appears to be a new user, as there is no data for the previous Thursday.) According to the readout, she has slept an average fo seven hours and forty-seven minutes per night, failing to meet her goal of seven hours of sleep only once.

Being familiar with FitBit outputs—and also being a poor sleeper—it seems odd that nowhere on this readout is it indicated how much time she spends awake every night. Instead, it shows that she spends, on average, one hour and thirty-five minutes in REM sleep, three hours and fifty-three minutes in light sleep, and one hour and twenty-six minutes in deep sleep.

Stay motivated

all day

After the viewer is given just enough time to get the basics of the read out, the camera cuts back to the original scene: the viewer now sees the blonde runner running up steps between stadium seats, behind the text “Stay motivated / all day”.

The next three shots consolidate the narratives of three of the characters previously seen: a close shot of the runner’s wrist (this time it is her right wrist, not her left) shows her checking her progress while running up the stadium steps; a jump cut to another close shot of the bicyclist, now

climbing industrial or institutional looking stairs, shows him checking his Alta HR display to see that he has traveled 5.1 miles. As the camera maintains its closeup of the bicyclist's stair-climbing wrist, new text appears:

tracks steps,

distance and calories

Almost as soon as this text appears—it is, after all redundant—the scene changes back to the sleeping woman. She is now see standing in front of a mirror applying lipstick. She is wearing earrings and a wedding band. She touches up her lipstick with her left hand, naked from embellishment but for the peach colored band of her FitBit Alta HR. We see only her back and her reflection in the mirror: the focus of the frame's composition is on the collection of jewelry neatly arranged on an expensive looking table. (It looks expensive not only because of the character's comportment and dress, therefore by association, but because of a gaudy lamp and a clock, both finished in Trump-like gold.) In addition to a wooden bowl full of rings or earrings, a tray that contains belts, one gigantic belt that would put a combination of James Dean and Audrey Hepburn to shame (if their buckles and glasses were to be blended), the viewer sees three neatly arranged sets of Alta HR bands in tasteful, lightly saturated hues of tan, purple, and grey.

A close shot of the woman's hands replaces the previous frame, and we see her reaching out to change the band on her device. As she snaps the tan band into place the following text appears:

interchangeable

bands

A jump cut briefly returns the viewer to the realm of the dancing character, whose bring pink band is the central focus of a one-second shot. This glimpse of the dancer's band is followed by a view of our bicyclist—although it is an assumption that this character is the same—reclining in a desk chair, with his hands clasped behind his head. (Arrested, as it were, by his own gleeful presence in a pristine office.) He is wearing a black band, a fact highlighted by yet another closeup shot of his wrist and his Alta HR's display that reads: 'Let's move!'

motivates you to move

Just as the viewer is able to read the Alta HR's screen, the text 'motivates you to move' appears in the upper right hand of the frame next to an icon of a man, arms raised, one leg half raised. We see the bicyclist's desk chair slide along a wooden floor briefly, before another cut returns us to the realm of the dancer's studio. She dances enthusiastically in slow motion, the pink hue of her band presenting as the only color-based interest in the scene.

Connecting you to what matters

The dancer's scene cuts to a scene of the sleeping woman smiling, draped in coat through which her arms are not inserted, walking down a street. Her tan Alta HR band is plainly visible as she holds the right shoulder of her half-worn coat. She walks confidently next to the text, 'Connecting you to what matters.'

As she looks down to check a notification on her Alta HR, the camera cuts to a close shot, revealing a notification that Jamie Scott has sent her a message. (The message itself is not readable on the display of the device.) Reinforcing text appears to the upper right of the band:

call, text and calendar alerts

In the final scene of this lately frantically paced advertisement—a pace that seems to reflect the frenzy of one's heart rate amidst all the incredible energy expended in the video—the viewer sees the blond runner finally reach the top of the stadium stairs. We see her finish running, and then stand, hands on her hips, her grey workout shirt damp with sweat around the collar, breathing. She looks up for a moment with a slight air of satisfaction, then raises her wrists to look at her Alta HR. She inhales deeply and exhales deeply as the following text stands above and to her left, receding ever so slightly into the distance:

Move to the beat of you.

The video closes with a restatement of the opening scene. Only two differences are present: now the Alta HR changes colors rapidly to demonstrate the number of options a potential user might have; now light grey text appears at the bottom of the screen that indicates the Alta HR's compatibility with Android, Windows, and Mac devices.

6.4.4 Extended Analysis

I will begin from the ending. Consider the line, 'Move to the beat of you.' It is astonishingly complex. 'Move' clearly refers to the agency one has over their body: one moves their body, and not the other way around. (At least not in any common vernacular sense.) In this way, one might readily approach the statement, 'move to the beat of you,' in terms of Cartesian dualism. The mind or the brain has control over the body and is therefore the locus of agency underlying the verb 'move.' But this breaks down somewhat when 'you' is considered. To 'move to the beat of you' implies that 'you (with your Alta HR)' is not the same 'you (without your Alta HR).' A different 'you' is constructed through the use of the Alta HR, and this is the 'you,' the beat of which, you will move to. If this isn't odd enough, or difficult enough to wrap one's head around, it gets even weirder when one considers the role of the word 'beat.'

Certainly, to 'move to the beat of you' is a play on the common phrase, 'move to the beat of a different drummer.' (It also echoes with one of my least favorite common phrases: "You do you.") The beat to which one will move is thus tied to the notion of music, or of organized sound—which can only be organized in temporality. But, given the context of this line in an advertisement for a FitBit device that tracks heart rate, 'beat' is also clearly refers to one's heartbeat. So, then, we can approach the 'you' that is constructed via the collection of data about one's heartbeat. The 'you' is partially constructed through this extraction and representation of data pertaining to one's heartbeat. What begins in the body as a necessary subconscious function is externalized through a process of extraction—via sensors embedded in the Alta HR. After extraction, the data is represented via the Alta HR's GUI. A feedback loop is thusly created between the embodied user

and the object-device. But the user's awareness of such an intrinsic part of living—literally of maintaining the ontological status of 'living'—comes from its representation on a device.

In this way, the 'you' that is constructed is always already a subject-object dyad. It is a thing. This thing, this you, cannot exist but for the involvement of the Alta HR. When we circle back to the opening verb, 'move,' the object qualities of the subject user come to the fore: the action of moving is taken in relation to the thing that is comprised of the subject-wearer and the object-worn. More specifically, the subject-wearer is moving to a representation of her heart beat as it is presented on the Alta HR's GUI. That she moves in response to that beat—and it must be in response, as any feedback loop must be temporally bound and therefore incremental—indicates that she is in some ways being acted upon by the object-worn.

For the sake of argument, let's assume that this is a completely voluntary type of involvement. The user *chooses* to respond to feedback from the device. This does not, in my opinion, categorically change her status as subject-object chimera. It simply makes her a willing chimera, an explicit or implicit part of an assembled thing. When one considers the external and largely invisible third parties that are represented by the Alta HR, however, her willing involvement in the constitution not only of the thing that is the FitBit, but also the thing that is her—the beat of 'you' to which she will move. The 'you' that is constructed is object-dependent. It does not exist but for the involvement and feedback of the Alta HR device. Therefore, it cannot be considered a purely subjective 'you.' She/you has changed, and she has changed in an ontological way. She has become an assemblage; she has become a chimera of subject and object.

I'll restate. To do so with greater clarity, let's give the Alta HR user a name. We'll call her Amanda. Amanda exists prior to her coupling with object that is the Alta HR to produce a thing. This thing exists by virtue of the ways in which it and Amanda interact. It is a thing because it

counts steps, counts and monitors heart rate, etc. It is a thing because it gives rise to certain actions relative to the subject that co-constitutes it, and does so in a way as to distinguish it from other potential things. When Amanda creates this thing, this FitBit Alta HR through using it, Amanda becomes an assemblage. That is, she is different; she is coupled with an object to make a thing. To complicate matters, this thing is worn: it is produced as a thing through the action of wearing. (It could not be a thing in the sense of a gathering if it were not worn because it would not be able to perform its designed functions: there would be no heart rate to monitor.)

So, Amanda and her FitBit HR are a thing. Amanda is different as part of this thing than she is as she exists outside of this thing. (Say, just walking down the street oblivious to the steps she's taken or her current heart rate.) In co-constituting this thing, Amanda is also producing and externalized representation of certain aspects of her bodily functions. She gains access to the externalized representation through a little screen on the device that displays numbers and the occasional pixelated emoji. In 'mov[ing] to the beat of [her]' Amanda is actively and intentionally altering her actions in relation to the externalized representation of herself that is created through the creation of the thing. She is part of the assemblage. In being part of the assemblage, she is no longer purely a subject acting upon an object: she is part of a thing. In being part of this thing—and by virtue of the fact that a thing cannot be reduced to any lower level than a dyad—she is engaged in a feedback loop between subject and object. But the subjectivity of one of the dyadic components, or the objectivity, shifts depending on perspective. The Alta HR and Amanda are both subjects and objects from certain vantages: the Alta HR is a subject in that the representation of Amanda that it creates and displays provides the impetus for Amanda's actions; it is a proxy-subject when one considers that it is a stand-in for the corporate entity, FitBit, Inc.; it is an object only in the most basic sense in that it is worn by Amanda. Reciprocally, Amanda is an object

because she is acted upon by the Alta HR; she is a subject-object chimera because she chooses to be acted upon by the FitBit; she is further more an object in relation to the projected Amanda that exists as an externalized representation on the FitBit's GUI. In short, Amanda is many things, none of which (when she is coupled with the Alta HR) is purely a subject.

The construction of this alternate Amanda begins, well, at the beginning of the video. The command to 'Live healthier,' is the first signal that provides characteristics about Amanda's chimerical form. Aside from the train wreck vernacular grammar, the two words combine to create a semantic realm: boundaries of the narrative that will follow, as well as the narrative's possible interpretation.

In the notion of health presented here, one gets the sense of that body as an object. Health, like the functioning of an engine, describes a state of corporeal functionality. In this way, we see that Amanda controls her body: her body is the object of her subjective personhood. (Once again, we see the lingering specter of Cartesian dualism.) The healthfulness she will achieve will be achieved in terms of her body. If it is not yet convincing that a divorce between the subjectivity of the person and the body-as-object has been completed—or in being completed serves as the foundation for this advertisement—then consider the next couplet:

3 Know your heart
with PurePulse heart rate

. Generally speaking, at least as I have encountered this phrase, the knowing of one's heart pertains to the recognition of a desire, but not necessarily a lustful desire or a material desire.

Rather, it implies a desire of trajectory, desire as it relates to the way in which one will live their life. Polonius' punchline echoes: 'To thine own self be true."

But this traditional reading, this expectation of something purely related to the satisfaction one might get from 'following their heart,' or living in a way that is true to themselves, so to speak, is turned on its head with the second line: "with PurePulse heart rate." As with the dancing described above, something strange is going on here. The viewer is set up to expect some kind of personal, emotional revelation pertaining to the knowledge of one's heart (i.e., the knowledge of one's desires). Instead, the heart—a symbol of desire, yearning, virtue—is reduced to its state as an organ. It is a muscle that pumps something in the range of six thousand liters of blood per day.

Despite the apparent conflict between the setup and the completion of these two lines, the ultimate effect is not one of ontological bifurcation. That is, the heart of the first line—a heart of emotion, subjectivity—blends with the heart of the second line—a muscle driving an objectified body. One is left with an unexpectedly holistic view of the heart: it is both of these things; both symbol and muscle-machine. Still, in the context of the device these lines are used to advertise, one is left with a greater sense of the objective form of the heart than of the subjective. In terms of the Alta HR, knowledge of one's heart is achieved through data extracted from it.

Amanda, the user, ostensibly comes to know her heart—that is, to know herself as a subject and her body as an object—through the representation of data that has been extracted from her and represented through the GUI of the Alta HR. As in the case of the last statement in the video-poem, we find evidence of a feedback loop between the user-subject and the object-worn. Amanda is mirrored by this feedback loop, creating an objectified (quantified, reductive, and objectivist) version of herself—her heart which is known *through* and *by means of* the Alta HR—that she then responds to. In responding, Amanda subjugates herself voluntarily to the form of capta (Drucker,

2014) defined by the specifications of the Alta HR. She is herself (where the construct of 'herself' is achieved via coupling with the Alta HR to create this thing, this subject-object dyad) and she is not herself. She is augmented by the object, the coupling with the object to produce the thing, but in being so augmented she is reduced, in part, seen through the lens of the boundaries of extraction. She comes to know her heart through statistics, through quantified data. In so knowing her heart as an object, she also comes to know herself as a subject that is, but virtue of her subjectivity, willing to couple with such an object to produce herself as a chimera: she is neither subject nor object, but part of a thing. In being part of this thing, she is submitted to the ontology of that thing. And this ontological status, as I have been arguing, must be one that emerges from the biune structure of subjects and objects as a triune: subject, object, and chimera.

The creation of this chimera, of the hybrid assemblage of subject and object by which both subject and object take on characteristics of the other, is not only instantiated through the physical coupling of Amanda and the Alta HR. It is also symbolically effected through the form of the communication/advertisement—a video within a screen—and through the symbol of the box in which the Alta HR resided prior to use.

First, the screen: as I have argued in Chapter Five, the screen presents as not *bild* but as *bilden*. It presents as a technical image that is attached to a particular technology. In being so attached, it takes on the interactive affordances of the screen, the computer—those actionable possibilities that arise between the computer screen and the user as a result of their overlapping or complementary physical and visual characteristics. Through its manifestation on the screen, the representation of Amanda as a subject-object chimera primes the viewer to accept this possible formulation of the user. It is easier to accept a vision of a future when that vision relies on the same modes of communication as that which is used to communicate it. The screen of the computer through which

the video is watched—or the screen of the smart phone, the tablet, the smart mirror—is technological kith and kin to the screen on the Alta HR.

The screen, in whatever chassis it resides, is also ontologically and epistemologically related to the notion of represented reduction. The screen constitutes a vantage, but not all vantages. It is one angle, one lens (one window to use the language of the computer and the web browser) from which and through which to view Amanda. In being a vantage, it implies (according to deconstructionist logic) other vantages, the specters of other vantages. It is through the accumulation of these vantages—their agglomeration—that a broader sense of the self is achieved. The question, however, in relation to the emergence of a gestalt user relies primarily on the extent to which other vantages are equally reliant on the physical metaphor of the screen.

It is through the screen, the visual representation of futures, that the futures being represented are translated into a present tense that looks forward. The forward-looking present tense is forward looking only through the screen, through what is visible in the screen. As such, the image of the future carries the limitations of the screen: it becomes only that which is visually (and aurally) representable. The future is as reductive or expansive as the materiality its representations take.

It is tempting to look upon the notion of reduction as something maleficent. To reduce the human seems a nasty endeavor, one contrary to the liberalism (and its variants) that have defined the past few centuries. But this is not necessarily the case. The reduction effected through the screen is one that points to a wholly new historical *a priori*. Through the discursive change of the thing, effected as it is through a fundamental change in the ontology of subjects and objects that couple or to form things, the discourse of the human is fundamentally changed. No longer is the human readily thought of a pure subject—as the locus of individualism, freedom of thought, and action. (Perhaps such an operationalization of the human is a pipe dream, anyway.) Rather the

reductionism of the screen, of the imaginary of IoT as presented via the screen, produces a reduction that is expansive. It produces a triune structure of a formerly biune ontology. In the construction of a third, liminal category between subject and object, the reductionism of IoT—of knowledge through extraction, and systems of systems predicated on extraction—we see the possibility for the final act of naturalization: we see the possibility to know the human, to produce knowledge about the human as social actor, in the same way that we produce knowledge about the external 'natural' world. In this light, the future imaginaries of IoT imply a final conquering of the human: a human as source for extraction who, by being a voluntary source of extraction, comes to know herself as neither subject nor object, but as chimera of both. She comes to conquer herself through externalization, through representation. She comes to know herself by reflection rather than introspection: the source of data is, of course, her embodied life; that data is extracted and externalized, subjected to analysis and representation via the IoT-enabled objects she chooses to enroll into her *habitèle*; that *habitèle* then feeds conclusions about her back to her. She constructs herself through the extraction and reduction of herself, and in so doing, she constructs something larger than herself, but also more reductive than herself. She *constructs* herself and *is constructed,* as both subject and object of construction via extraction and analysis.

She is as the object in the box. In coupling with the object contained in the Alta HR box, she produces herself as a thing. In so producing herself, she opens the future contained in the box and resides in it. She becomes the imaginary of IoT, a walking (running, beating, dancing) homunculus of future expectations of the human. She becomes a living discursive transformation achieved through the breakdown of the barrier separating subject and object; achieved through the creation and embrace of an externalized, extracted self-constructed through quantitative data and fed back in the form of graphs, charts, and encouraging phrases presented via that most universal of symbols

for modernity: the screen, both *bild* and *bilden* . She moves towards being a human incapable of humanity but for the armature of the technical image.

6.5 Beyond Mere Fitness

Where FitBit devices extend the grasp of IoT to the bodily realm of circulatory health and overall fitness—or some *a priori* definition of fitness based on the number of steps one takes in a given day—this is not the only realm of the body in which IoT is active. In this and the next section of Chapter Five, I will discuss two technologies that, while clearly present in the IoT market, have not yet gained such a large market share. (Indeed, the corporation that produced one of them, Lumo Bodytech, Inc. has folded and no longer produces or sells its wares.) The reasons for this are manifold, but can broadly be summarized as stemming from the unique functionality of each device, which limits potential users. The first, the Lumo Lift, is a device that is intended to help users correct bad posture—those nasty slumps and hunches that one encounters over desks, bars, steering wheels, and, indeed, much of the sedentary lifestyle of the modern human. The second, the iHealth Glucometer, is an IoT-enabled device that is designed to help monitor glucose levels in users diagnosed with diabetes. For reasons of functionality, one sees rather easily the limited nature of the devices' marketability.

A line from a recent episode of the situational comedy, Brooklyn Nine-Nine, summarizes the role of the spine nicely. One of the main characters in the ensemble cast declares: 'why should I worry about my spine? It's only a superhighway that contains all of my body's nerves!'

All humor aside, Captain Holt's concerns are warranted. As was deftly argued by Vilém Flusser and Luis Bec in their comparative phenomenological work, *Vampyroteuthis Infernalis*, the spine is absolutely integral to the construction of the human *umwelt*: its structure separates us, through an upright posture that frees two limbs otherwise used for ambulation, from our four-legged ancestors (to a lesser extent, perhaps, that it separates us from the species that shares its

name with the work's title); similarly, it renders our bellies vulnerable, no longer secluded by a spine that runs parallel to the earth and ribs that descend from it as in a cage, but rendered accessible by a vertically rising spine—all but perpendicular to the ground upon which we now walk—and ribs that run parallel to the earth, that end abruptly before structure and protection is reasserted by the pelvic girdle.

Possessing—or, rather, being part-and-parcel with, as the notion of possessing part of one's body can be said to reinforce the mind-body duality that is so central to the subject-object dichotomy that proves problematic in contemporary cognitive science—a vertical spine relative to the earth seeps into more than just the phenomenological world. It impacts our language and therefore our very understanding of the world around us. (Here I take a loose approach to the relationship between language and understanding, but as I have noted earlier, this approach is largely in agreement with the work of such semioticians as Claude Levi-Strauss and Umberto Eco.) The effects of a vertical spine extend from the mere physics of locomotion and proprioception to those ethics and behavioral standards that serve to emphasize the ways we differ from creatures that not only possess an earth-parallel spine, but do not possess language. There is something very humanistic in the act of living with and through our particular spine.

To 'be spineless' is to be cowardly, to go ethically or morally limp in the face of adversity or challenge; when your back goes out, you're immobilized, unable to stand the demands of the physical world; to suffer a permanent spinal injury is to be thrown from the broad horizon of the human *umwelt* into a very limited portion of it, wherein the body extends to include wheelchairs, Baclafin pumps, and, often, a large sociotechnical network of institutional infrastructures and medical care providers. While the human user of a given technology—the subject that couples with an object—is routinely defined in a limited way based on the immediate intended

functionalities of the object, a broader, more humanistic definition of the user must begin with the spine—or at least at a level of analysis that considers the relationship between embodiment and *umwelt*. In many ways, the daily life of the human user begins and ends with the spine; the mundane is at least as spinal as it is cognitive.

So, it comes as not a big surprise that the IoT has expanded its reach to include that most integral part of the body: the spine and its related skeletal structures. Its reach and grasp on the spine is in line with the overarching narratives of efficiency and data-driven improvement so topically central to IoT. IoT grasps the spine from the vantage of posture. But, as we will see, it's focus on posture is less to do with health than it is to do with perception: the social and cultural interpretation of posture. Enter: the Lumo Lift.

6.5.1 The Lumo Lift

The Lumo Lift is a 'tiny posture coach and activity tracker that works with a free iOS and Android app to help you sit straighter, stand taller, and look better.' The last half of this definition is the most salient, echoing as it does prior instances of double-entendre that were encountered in the enrolling rhetorics of FitBit devices. So, let's consider the three described effect more closely: 'sit straighter,' 'stand taller,' and 'look better.'

The phrase 'sit straighter' is one of those quaint American-English phrases that actually means very little outside of colloquial communication. One does not sit straight at all—to sit, in fact, is to bend and to rest upon the point of bending: one does not sit on one's feet, as would be the case if we sat straightly relative to the ground, but rather on one's bottom, which is actually located at the middle of one's body—at the point of bending. Moreover, there is no directional integrity, no trajectory relative to which one might maintain straightness: to sit is to be at rest, but it makes even less sense to suggest that one might 'rest straighter.' So, then, we must assume that 'sit straighter'

is a stand-in for ‘sit up straighter,’ where the word ‘up’ is removed to maintain the bipartite construction of the three effects a user might expect to achieve through use of the Lumo Lift.

Ah, to ‘stand tall’: to remain firm in one’s beliefs, to hold oneself to an exceptional moral or ethical code; to hold one’s ground in the face of a challenge; to not shy away. (Metaphors beget more metaphors, it seems.) Even in this colloquial and metaphorical sense of the phrase, it appears odd. There is, after all, a functional limit to the tallness with which one might stand. (I am about seventy-five inches tall when I get out of bed in the morning, when gravity hasn’t performed its daily downward squeeze—I can stand no taller than that without the aid of prosthetics.) A more accurate declaration for the device might be: ‘stand your tallest.’

Finally, ‘look better.’ Better than what? Better than yourself? Better than some version of yourself that does not stand tall, that does not sit straight? That does not engage in the impossibility of literal action based on metaphorical statements? There will be more time for analysis of this last statement later, following discussion of the video that advertises the Lumo Lift.

6.5.2 Methodological Disclaimer

At the time of initial research into this product, the Lumo Lift was produced and sold by a corporation called Lumo Bodytech, Inc. However, on June 28th, 2018 (as is now advertised across the top of the corporation’s website in a bright green bar) Lumo Bodytech, Inc. entered into ‘assignment for the benefit of creditors’ agreement with a limited liability corporation registered in the state of California. Legalese aside, one can infer from this information (provided on Lumo Bodytech. Inc.’s website) that the corporation was no longer solvent, and as opposed to filing for one form of bankruptcy or another, deferred financial obligations (and liabilities) to a related, but separate limited liability corporation (LLC) such that creditors could be reimbursed to an agreed-

upon extent without bankrupting the individuals in whose names Lumo Bodytech, Inc. was registered.

Although initially frustrating, given the amount of time already devoted to the analysis of the Lift (and the fact that my own order of the device will not be fulfilled, thereby precluding me from performing any hands-on analysis), the current situation nonetheless presents an opportunity: to analyze a failed IoT device. This appears as an opportunity rather than a crisis because of the following logic: IoT is an ostensible infrastructural layer; infrastructures are born of what John Law refers to as hopeful monsters; some of these 'monsters' prove just too hopeful and fail. It would have been an unfortunate oversight on my part had I conducted analyses solely on solvent and functioning IoT-involved companies and their products.

6.5.3 The Lumo Lift: Background and Website

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One is initially introduced to the concept of the Lumo Lift by way of the company's website: www.lumobodytech.com. Scrolling down the Lumo Bodytech, Inc.'s webpage, following the jarring news of the company's insolvency, one is greeted with a stereotypical dropdown menu that allows for navigation of the website in-full. Under that banner, the viewer gets to the meat and potatoes of the site: a large graphical banner spans the width of the page. It contains in image of a middle-aged female, hair cascading over one shoulder, soft smile on her face, wearing a white blouse. (She is visible only from the bust-line up.) A grey square is barely visible against her white blouse, but it is highlighted by a black circle, which is connected to another. This secondary circle

provides a zoomed-in view of the Lumo Lift device she is wearing. Above this closeup of the device, in all caps, one sees the following text: 'YOU SLOUCH, IT VIBRATES.'

To the left of our Limo-Lady in White, the viewer finds some enrolling text: "90% of users reported improved results in as little as 14 days. Lumo Lift is a wearable posture coach that helps you sit straighter, stand taller, and look better by buzzing when you slouch." This text is followed by the logos for several major media outlets that have endorsed the Lumo Lift, or have at least provided coverage of it: "Inc., CBS, theSkimm, The Dr. Oz Show, The New York Times, CNN." The intended effect of this inclusion is obvious: in presenting these various media outlets as (implicit) endorsers of the product, the makers of the website hope for an advertising form of transference. That is, it is hoped that followers of those media outlets will transfer their reliance on, or faith in, those outlets to the product itself, thus becoming more likely to enroll in this particular bit of the IoT's infrastructure of the mundane. Just above the presentation of these media outlet logos, the viewer finds a link to watch a video about Lumo Lift.

Beneath this bit of enrolling text, the viewer sees the following in bold and caps: "HOW LUMO LIFT WORKS." This statement is followed, scrolling down the page, by another restatement of the Lift's intended functionality, and by a four-frame narrative of how one uses the device.

The first frame is a picture of a smartphone held in someone's right hand. The phone appears to be a late model iPhone, and the Lumo Lift GUI is visible on its screen. It is labeled, 'CONNECT,' and followed by a caption that includes a link to download the application: "Download the free Lumo Lift App onto your supported device and follow the detailed instructions to set up your Lumo Lift."

The second frame, “WEAR,” is comprised of a GIF depicting, in a perpetual loop, the act of removing a magnet from the Lift device, inserting the device under a blouse along the collar bone, and replacing the magnet on top of the blouse’s fabric. It is presented with the following caption: “Remove the magnetic clasp from you Lumo Lift. Place your Lumo Lift under your shirt, right below your collarbone and use the magnetic clasp to secure it in place.” The woman acting out these instructions in the GIT is wearing a grey blouse with a gold neck chain.

A third frame, depicting the same woman presented in the second frame, is labelled, “RECORD,’ and shows the woman pressing her index finger onto the magnet that represents the location of her Lift under her blouse. The ostensible user is directed to, “Get into your best posture and press your Lumo Lift once to set your target posture.’

Finally, and in the most telling of these frames, one is directed to ‘IMPROVE.’ Two superimposed images of a blonde woman wearing a black blouse and black jeans are presented. She is sitting in an outdoor area. The largely transparent superimposed image depicts the woman sitting with her terrible posture: roughly 45 degrees between her knees and shoulders. A green set of concentric circles flash at the point of her right shoulder. The primary image, non-transparent and in clear focus, depicts the same woman sitting with good posture, about 90 degrees between her knees and her shoulders. She is smiling in this imagine, while she wears an almost exasperated look in the poor posture image. The text, ‘Receive a simple vibration when you slouch, reminding you to sit up straight,’ amends the image. Here, again, one is presented with a link to view a video about Lumo Lift.

Scrolling further down the page, the viewer is presented with more text that serves an enrolling purpose: the text promises that Lumo Lift will help the user “LOOK BETTER, FEEL BETTER, BE BETTER.” Oblique references to research at Ohio State University are presented to argue that

people with better posture report having more confidence. This statement, as are all other references to research, is followed by an asterisk. Notably, however, the asterisk's counterpart (i.e., an explanation of the claim) is nowhere to be found on the site. The scientificity—or the appearance of scientific grounding—appears to be enough. This extends to findings about the relationship between improved posture and higher self-esteem, more arousal, better mood, and lower fear; and findings about the prevention of back and neck pain. This appearance of 'science' will also play a large role in the video that is used to advertise the Lift. (This will be analyzed in the next section.)

Finally, one scrolls past a bullpen of user reviews, each of which indicates satisfaction with the product, to view some of the more technical details of the device. Their place at the bottom of the page, however, as well as their lack of visual interest, indicates that the information included in this portion of the page is not a very high communicative priority. As I will demonstrate in the next section, the appeal of the device (and possibly of the majority of IoT-enabled devices) is found in the usability rather than the functionality: that is, the appeal is found in the imaginary of IoT that is presented through scenarios in which users' lives are somehow improved, rather than the complex and sometimes stunning technical achievements that even allow for an imaginary of IoT.

6.5.4 Lumo Lift Video Advertisement

The video found on Lumo Lift's site that is dedicated to description of the Lumo Lift focuses on two characters: a blonde female and a brunette male. Both appear to be in their mid-twenties; both are young professionals. The structure of the video is such that cuts occur roughly every few seconds. In this way, the authors of the video are able to maintain a direct parallel between the two

characters: for the majority of the video each cut switches between characters. Moreover, they are often engaged in similar or parallel activities between cuts. This structure is not conducive to a scene-based analysis if scenes are to be considered alongside the narrator's spoken content. As such, and in order to adequately focus on the visual content of the video alongside the narrator's spoken content, I provide the full transcript of the video below. Following that presentation, and in line with the style of presentation used in the description of the FitBit Alta HR video, I break the video down by cuts using snippets of the transcript as a guide. Unlike my coverage of the Alta HR video, however, I engage in a close reading of the text presented by the narrator prior to a rich and critical description of the video's visual content. Unlike my treatment of the FitBit Alta HR video, I do not engage in a reading of the full video. Instead, I choose to focus on a few key points.

6.5.5 Narrative Content of Lumo Lift Video Advertisement

Here is the full, prosaic transcript of the video:

> Confidence and appearance both start with how you hold yourself. But it can be challenging in our busy, stressful lives to remember to stand tall and sit strong. The solution? Lumo Lift. Lumo Lift. Lift is a revolutionary appearance booster and activity tracker that provides you real-time feedback to guide you to great posture. It's a magnetic sensor worn like a clasp or lapel pin on your upper body either as jewelry or hidden under your clothes. Lift tracks your body positions and movements. When you slouch or close off your body, Lumo Lift provides a gentle vibration to remind you to keep your shoulders down and back and your head lifted. Lift also connects to an app that tracks your posture, giving you gentle nudges to help you improve over time. Why is this important? Lift was built based on scientific research showing that when you hold yourself in an open, upright position you actually get a surge of hormones that make you feel and look more powerful. Great posture helps prevent back pain, lower stress, and helps you to become more productive. So keep pushing, and Lift with be with you every step of the way. Bring out the more healthy and happy you.

Two socially and culturally grounded attributes frame the Lumo Lift narrative: 'confidence' and 'appearance.' These two attributes serve to place the functionality—the intended result of a user's engagement with the Lift—not in terms of health (as with the FitBit products described above), but in terms of interpersonal aesthetics. Such aesthetics, although fundamentally interpersonal—one is 'seen' as confident via their appearance—are further framed in terms of self-perception. The invocation of self-perception highlights the confounding nature of the subject-object dichotomy that underlies imaginaries of IoT, and which also resonates with the echoes of Cartesian dualism.

That 'confidence and appearance both start with how you hold yourself,' implies a subject-object dichotomy that is always already embodied within the user: the user constitutes both a subject and an object. In linking 'confidence' and 'appearance' with how one holds oneself, the nature of being confident and maintaining one's appearance is shifted from a presumably interpersonal realm into an internalized loop extant between one's mind and one's body: how else could the statement 'you hold yourself' be meaningfully parsed if 'you' and 'yourself' are not presumed to be ontologically separable?

In this instance, 'you' appears to refer to a mental entity, while 'yourself' seems to refer to the embodied, material aspects of 'you.' It is an odd distinction, to be sure: that 'yourself' appears to refer to the physical embodiment of 'you,' despite the tendency to align notions of 'self' with more holistic conceptualizations of the meeting point between spirit and body, between personality and physicality. In the first sentence alone, one finds an already muddled ontology that highlights Gibson's observation of the troubled relationship between subjects and objects.

That the next sentence begins with the word, 'but,' indicates that the achievement of a confident appearance is not standard or to be expected. Instead, 'but' introduces a conceptual realm

of obstacles that prevent the achievement of a confident appearance. These obstacles are framed as 'challenges' (ie., opportunities for virtuous 'triumph over adversity' in the words of Cannonball Adderley) derived from the very social and cultural infrastructures of our lives: business and stress, both presumably related to the maintenance of a life within a Western, capitalist society. This setup begs the worth of the Lift: through its functionality, the nature of the subject-object coupling that renders it a 'thing' in IoT, Lift is presented as a solution to these challenges (stress and business) that ostensibly prevent a person from achieving a confident appearance in which that person, that user, learns to 'stand tall and sit strong.' (I have already devoted some discussion to this rather unfortunate slogan in the previous section, but wish draw the reader's attention to the slogan's similarity to the tagline for John C. Reilly's farcical satire of music biopics, 'Walk Hard: The Dewey Cox Story.')

The framing of the enrolling narrative, a *petitio principii*, is seen through to its logical (or illogical) conclusion with the lines: 'The solution? Lumo Lift.' (It is possible to see this as an example of the *petitio principii* fallacy because the worth of the Lift as a device is predicated on the acceptance of the premise that there is a problem in the maintenance and upkeep associated with one's posture and general appearance—more specifically, there is a technologically-grounded problem….) As with the great rhetorical stutter of advertisements and popular music alike, it is repeated again: 'Lumo Lift,' like a alliterative earworm, a pop-song-hook for an IoT device.

Following repetition of the product name, the bread and butter definition of the Lumo Lift is presented: "Lift is a revolutionary appearance booster and activity tracker that provides you real-time feedback to guide you to great posture." As with much of the material presented in advertisements, this sentence initially makes sense: it passes over the ear as any other reasonable statement might. But it resounds with contradictions and the empty space of echoes that describe

not the product, but the social and cultural circumstances that surround the product—the historical *a priori* in which the product was designed and is intended to be sold.

First, we have the term 'revolution.' It is an odd word choice for a few reasons: (1) the term carries with it not only a sense of deep change, as in a fundamental reconstruction of a once-functional sociotechnical infrastructures, but also a violence that is not necessarily physical, but certainly Derridean; (2) a revolution is always already at least dichotomous in that is pits at least one (new) system against an older one—it seems odd to think of a revolution that occurs within an extant infrastructural system that does not also overthrow it in some way; (3) a revolution, first and foremost given its roots in the Middle French (*revolucion*) refers to the completion of an orbital movement as in, say, celestial movement. The combination of these three layers of 'revolution' creates a patently absurd condition: one of deep change against some predefined condition, but which it cyclical in nature, and thus ultimately transient or ephemeral. In framing the Lumo Lift as a 'revolutionary appearance booster,' the video ultimately suggests that boosting one's appearance is fundamentally a Sisyphean task: even in its ability to create upheaval in the realm of managing one's appearance (which, remember, is framed as an internal process based on the language of 'how you hold yourself') is a cyclical process that assumes a perpetual motion of improvement. This implicit perpetual motion is ultimately an alienating force: one's appearance (and therefore the mind/body dualism that underlies the possession of the body by the mind) is never fully good enough, is never optimized. Instead, it is subject to the historicity of revolution, both political and physical, both documentary and embodied. In the objectification of the body as something that can not only be possessed by the mind, but also improved through the use of external, prosthetic sensors (which will be described soon), the core coupling of mind and body is broken, and the stature of the body becomes something that must be improved—like a least-

squares regression line, an algorithm, or the swing of a baseball bat. The rhetoric of the narrator's framing places the body in full subservience to the mind, and in supporting such a dichotomy, it further disembodies the human and simultaneously dehumanizes the body. In the rhetorical inclusion of 'revolutionary,' the close reader finds the objectification of the human—the human-as-user—in an imaginary of IoT as it occurs at the scale of the human body. Once again, the subject becomes object, the objectivity of a sensor-imbued object begins to look more like a subjectivity. The constituent parts of the 'thing,' like a virus, feed upon the host subject and in their symbiotic relationship, the object objectifies the subject.

Second, the reader is confronted by the term 'booster.' Here a simple reading will suffice: 'booster' functions to situate the use of the Lift within the greater discourse of 'quantity over quality.' That is: to boost is to increase, possibly in height (as in the booster chairs of children), but also to augment.

That 'booster' is combined with the notion of an 'activity tracker' indicates that such an augmentation will occur via data that is collected. Put differently, the augmentation will be quantitative in nature. (The revolution, it seems, will not be televised, but rather transmitted via technical image driven by the data of computerized empiricism.) One finds yet another paradox in this choice of language: the act of boosting or augmenting is accomplished by an act of reduction in which the postural behavior of the user—that which is taken as a proxy variable for 'confidence,' which as argued earlier exists in a feedback loop between an embodied system so bluntly dissected into 'body' and 'mind'—is reduced to a bounded indicators that can be numerically represented. (One wonders whether or not Humphrey Bogart, with his hidden limp, small stature, and WWII-numbed facial features would succeed in this new, eternal return of the revolution…)

The introduction of the notion of 'real-time feedback' is the point at which the Lumo Lift is most clearly categorized as an IoT device. The subsequent lines further place the Lift within the realm of IoT:

> It's a magnetic sensor worn like a clasp or lapel pin on your upper body either as jewelry or hidden under your clothes. Lift tracks your body positions and movements. When you slouch or close off your body, Lumo Lift provides a gentle vibration to remind you to keep your shoulders down and back and your head lifted. Lift also connects to an app that tracks your posture, giving you gentle nudges to help you improve over time.

Here we are presented with an overview of the functionality of the Lift, a simplified schematic of the means by which it provides 'real-time feedback.' The first aspect of its functionality—reminders to improve your posture—are reminiscent of a parent's or teacher's childhood chides, and does not necessarily place the Lift within the realm of IoT. Its second functionality, however, does: that the Lift device is connected to an application (ostensibly on one's smartphone) means that through some form of connectivity protocol (likely Bluetooth), the devices is connected to an Internet-connected device. Thus, it is an IoT device. It functions as an object with its wearer-subject is coupled, but also as a subject-object pivot between the subject-wearer and the greater subjective entity represented but the application's GUI.

It is difficult to speak of this 'greater subjective entity' in more concrete forms because it is, by its very nature, amorphous and heterogeneous in its makeup. At first glance, one sees only the subject-wearer and the object-device, but there is a potentially grand constellation of subjectivities lurking behind the object-device: the corporation responsible for Lumo Lift, which depending on its corporate charter and the type of business it is, can be construed as an individual according to US law; in addition to this corporation-individual, one must consider the likelihood of Lumo selling data to advertisers, who would then constitute yet another heterogeneous subjectivity

entangled in this increasingly large web of the Lift-as-thing; finally, one must attempt to differentiate between the Lift-as-object and the Lift-as-thing. That is, one must ask where does the worn device end and the chassis of the smartphone begin? Are they two separate objects? Do they deserve to be counted as such in accounting for the makeup of the Lift-as-thing?

There are arguments to support both approaches: a functionalist argument that supports the notion that the smartphone and lift couple constitute one object, albeit a compound object; a less reductionist argument, however, concludes that the objects are separable and therefore separate. The Lift device itself might breakdown, but that breakdown would not have any impact on the functionality of the smartphone; conversely, if the smartphone (as home to the Lift application) were to breakdown, this would have a catastrophic effect on the functionality of the Lift. So, then, it must ultimately be argued that the chassis of the smartphone—it's physical instantiation in the world—is not the appropriate level of detail at which to view the compound objectivity of the Lift. Instead, one must further divide the smartphone into the physical object and the code that is used to construct the application, which is then run via the physical object.

As container for software, the smartphone becomes a sort of archive unto itself. Perhaps more generously, the smartphone becomes a portal into the greater archive that is now being created via the proliferation of IoT. This archive of IoT, broadly considered, constitutes a bifurcation of the greater human archive: it divides itself, by virtue of its phenomenological inaccessibility, into a human-readable archive and an archive of chimeric object-subjects that, through their heterogeneous constructions (almost akin to the compositions of complex biological organisms) collect, analyze, translate, and represent data for human consumption: through the functionality of different systems within these chimeric object-subjects, data is first entered into the phenomenologically inaccessible archive of IoT and then translated into representations of such

data that can be interpreted and acted upon by subject-users. Logically, in this way, archival inscriptions pass first from the world of the human umwelt, through a process of data collection, into the archive of the IoT; then, through a process of translation, pass from the archive of IoT back into the human umwelt, and finally through records of actions or actions themselves, pass into the human archive, *l'archive*. Just as the notion of 'thing' in IoT is predicated (as I have argued) on the heterogeneity and compound construction of subject-object constellations, so too is the effect that IoT has (and will have) on the greater historical archive. I do, however, digress. This aspect of the emergent archive of IoT will be discussed in much greater detail in the final chapters of this dissertation.

In the meantime, and prior to presenting a detailed description and analysis of the video content of this advertisement, two final aspects of its textual content needs addressing. They appear in the excerpt that follows:

> Why is this important? Lift was built based on scientific research showing that when you hold yourself in an open, upright position you actually get a surge of hormones that make you feel and look more powerful. Great posture helps prevent back pain, lower stress, and helps you to become more productive. So keep pushing, and Lift with be with you every step of the way. Bring out the more healthy and happy you.

In this light, Lift appears as a panacea for social woes, but also for spinal pains.

6.5.6 Visual Content of Lumo Lift Video Advertisement

The video opens with a medium shot of the blonde woman walking on a busy city sidewalk towards the camera. She is wearing a black jacket, black skirt, and an off-white blouse. She is holding a cup of coffee in her left hand, just above a purse. She is walking quickly. A watch is

visible on her right wrist. As she makes her way closer to the camera during the first two seconds of the scene, a shiny square button becomes visible on the left lapel of her jacket. Like Zevon's werewolf drinking a piña colada at Trader Vic's, her hair is perfect.

The cleanliness—in both posture and presentation—is mirrored by the cleanliness of the cityscape around her. A row of green bushes lines a building, all right angles and shine, to the character's right. To her left, where the sidewalk meets the street, the viewer sees a long line of trees of roughly even height, each planted in uniform pots. Even the traffic moves in a uniform fashion: she is walking with the flow of traffic on a one-way street.

The narrator enters as the blonde female character reaches the edge of the frame, and a cut reveals another character. This one is a male, short but slightly messy dark hair, rectangular glasses. He is wearing a button-down shirt that is untucked, but his face is clean-shaven. His undershirt shows a little. He is wearing jeans and carrying a grey messenger bag over his left shoulder. A watch is also visible on his right wrist.

As with the female character before him, the male is walking towards the camera. The composition of the scenery, however, is flip-flopped. The male is walking next to row of shop windows to his left. He walks past a cafe, which is accompanied by a black chalkboard sitting by the sidewalk to his right. Upon closer inspection, the sidewalk upon which he is walking appears to be lined entirely with cafes: awnings and brightly colored chairs are seen beyond the

The two scenes are composed as if nearly mirror images of each other. In this image, the man walks past a line of buildings on his left, as opposed to the woman walking along buildings on her right; the street is to the man's right, while the street is to the woman's left. The composition these two scenes serves to unify them: the viewer is immediately aware that the two characters are similar if not interchangeable. To further this effect, the primary aspect in which the composition

f the scenes differ also has a unifying effect: both characters wear a watch on their right hand and carry a bag over their left shoulder.

Subtle differences, however, differentiate the videos beyond the apparent sex-based difference between the characters. These differences speak to the assumptions that underlie use of the Lumo Lift. The man is comparatively disheveled. His shirt is untucked. The left wing of his collar is askew across the strap of his messenger bag. He is wearing blue jeans. (His smart phone is clearly visible in the form of an outline in his jeans pocket.) His wardrobe stands in stark contrast to the apparently business-like dress of the female character: the black blazer, the black skirt, the off-white blouse. The female character is unquestionably more formally dressed than the male character.

The contents of the scenes' backgrounds serve to further solidify the difference in formality. As described, the woman is walking down a clean, downtown city street. The male character, however, appears to be walking along a sidewalk in a mixed-use neighborhood—a neighborhood where one might expect to find walkups nestled above ground-level shops. Rows of trees are present next to the street in both scenes, but their appearances are vastly different. In the female scene, the trees are planted in uniformly distributed (and manufactured) pots. They have hard angles, as do the pots that contain the shrubs that line what appears to be the ground floor windows of the skyscraper to her right. The woman is walking with the flow of traffic; the man is walking against traffic, although little traffic is visible—only a row of parked cars. Seats line the sidewalk in the man's scene; there is no room for sitting, for dawdling in the woman's scene. The color scheme is bright and the sun is out in the man's scene, seen through the glow of the underside of leaves. The sun is also out in the woman's scene, but it has little impact on the brightness of the

street: it is not seen through the trees, shadows are long, punctuated only by the sun's reflections between the buildings.

These differences, although not immediately related to the IoT product being advertised, are nonetheless important: the construct stock characters (a sort of contemporary, workplace Commedia Dell'Arte) who stand as archetypal users of the product. If, as I have argued, a 'thing' is comprised not only of an object, but of the actionable coupling between subject and object, then the character of the subject must be taken into account when attempting to define the 'thing': put differently, it is not possible to define a 'user' (or, therefore, the usability) of an object without being prepossessed of a vision of an idealized subject who/that is designed-back via the design of the object. Taking this line one step further, we might say: it is not possible to define a user or an object's usability without co-designing the two simultaneously. In the opening shots of this video, we see that the design of the characters will be integral to the viewer's understanding of the usability of the object. The Lumo Lift, like each of the IoT-enabled devices or IoT-facilitated scenarios we have already seen in this chapter, does not begin and end with itself, but rather extends in a network of subjects, objects, and socio-cultural-technical expectations.

The use of meanwhile cuts in this video, and therefore in framing the temporality of IoT, does not limit the narrative delivered to the viewer to only those characters or occurrences directly referenced in the video. Rather, the meanwhile cut is open-ended, framed only in the expanding notion of all instances of synchronicity to which the IoT might give rise. It is not simply that as the woman walks to work, so to does the man; rather it is that as the woman and the man walk to work the world around them, relatively unified through the composition of the city scenes through which the characters walk, myriad (indeed functionally countless) and unbounded events are

occurring, tied together by their enrollment in the network of IoT objects—in their enrollment in, and construction of, the sociotechnical imaginary of IoT.

6.5.7 Scientificity in Lumo Lift Video Advertisement

I would like to draw the reader's attention to a final scene in the Lumo Lift video. In this scene, the female character is at work. She is standing in front of a whiteboard, marker in-hand, discussing a plot on an x-y axis.

The narrator says: 'Why is [the functionality of Lift] important? Lift was built based on scientific research showing that when you hold yourself in an open, upright position you actually get a surge of hormones that make you feel and look more powerful."

As this narration meets the viewer, the female character take a marker and edits the positive trend that is depicted in the graph upon the whiteboard: at the zenith of the plotted trend, the female character extends the trend further upward as if to illustrate that a small change in something—an approach, a calculation?—might yield better results.

In this scene, the plot on the blackboard in combination with the narrator's use of the phrase 'scientific research' creates a sort of big-data-driven scientificity that generally pervades imaginaries of IoT. That is, 'science' appears to be the answer to all of life's problems, where science is implicitly defined as quantitative, data-driven knowledge production. In the context of the Lumo Lift video, the humor in this approach is patently apparent: quantitative data, and therefore objectivist data, is seen as a panacea for certain purely social (i.e., constructed) behaviors that result in negative appraisal: it is as though the complex system of social interactions and appraisals can be described and made to run in the most positive way through the crunching of numbers related to one's spinal situation.

One must also not overlook the fact that the female character is used to illustrate a point about achieving higher confidence and perceived confidence given the inclusion of the term 'hormones' in the narrator's spoken lines. To be sure, the endocrine system does not exclusively serve any particular gender: it is ubiquitous in all humans of normal anatomy and physiology. So, too, are the hormones that the endocrine system regulates. But, the odd importance of the female character's presence on screen during this scientific justification for Lumo Lift becomes laden with meaning and import when one dissects the overall narrative of the video.

As stated above, the Lift is framed as a posture-correcting device. Posture is seen as something to correct primarily from a social point of view—it is framed in terms of power, confidence, and the perception of others. (As opposed, say, to a statement about one's spinal or bodily health that would have to be approved by the Food and Drug Administration.) One might say, then, that the Lift is framed as primarily an aesthetic device, or a device the use of which is intended to impact one's personal appearance.

From the outset of the video, where the female character (blonde, too—the epitome of stereotypical Western beauty) is seen walking down a formal-looking city street and the male character (relatively disheveled) is seen walking along a less manicured, more informal city street, the female character is presented at a rhetorical disadvantage. Not only is she seen first—and therefore might be interpreted as representing the primary market to which the Lift was to be advertised—but she is seen as needing to thrive in a situation of greater formality. She is the underdog: underpaid, under appreciated.

At first viewing, the video seems to present Lift as a device that will remedy the plight of the professional woman: it will allow her to appear more powerful, more successful. But the reliance on appearance in this narrative, this would-be solution, gives away the game. The Lift, in

presenting itself as an aesthetically-based remedy—one grounded in big data, no less—further entrenches the female character in the sexist structures of the workplace. That is, the female character must lean into and 'fix' the aesthetic shortcomings of her body in order to appear more confident, more powerful. The focus, in being on the body of the female, is still a focus that passes through the lens of the male gaze. (I use the term 'male gaze' here in a way similar to Foucault's medical gaze: a constructed and *a priori* mode of seeing the world, which itself comprises a discursive platform.)

The utterance of the word 'hormones' while the female character is on screen serves to solidify this counterproductive rhetoric, and indeed, presents the Lift not as a solution to sexism in the workplace, but rather as a continuance of it. The female body remains defined through the male gaze. Moreover, it remains defined through a male gaze that extends well into the structuration of the scientific method—of the objectivist tendency to represent the world in quantities and to analyze those quantities as proxies for worldly phenomena.

We see, then, that the Lift—as part of the greater object-ecology of IoT's sociotechnical imaginary—is presented as a device of the status quo. The advertisement seems to say that the world of IoT will be different, more effective, but it will be different only in its trappings, not in terms of its discursive structure. The body—particularly the female body in terms of this advertisement—will be objectified to a greater extent, passed as it is through the meat grinder of objectivism, of big data.

In each of the scenarios that the video presents, the viewer is presented with a cultural norm. Not necessarily a cultural norm that applies uniformly across all members of a society, but perhaps the majority of members belonging to a corporate culture—a culture that blends the history of

board rooms and offices, Oxfords and pantsuits, with the rise of the jeans-loafer-backpack combination seen previously. In each of these scenarios, we see a history, an archive in motion—its changes effected through, perhaps, novel forms of expression and the slow sea change of dress codes and acceptability. (One tends to think of the saying, 'If I can afford to eat here, I don't have to wear a jacket.

6.6 IoT at the Scale of Blood

All this is to say that the promised impacts, the outcomes a user might expect from wearing a Lumo Lift, are connected to and indeed derived from extant cultural practices and expectations. These expectations, extant beyond the design specifications of the device itself, nonetheless instill certain values into the designed object. The Lumo Lift, like all other IoT-enabled objects, by its very nature couples with a subject (thus producing the 'Thing' in IoT) in such a way that upholds or demolishes, engenders of emasculates certain culturally held values. These values, again although they are outside the standard scope of design, are part of the archive from which the IoT-enabled object arises; these values are also possible impacted by the design, creation, and adoption of IoT-related technologies. From the archive, through the present, back to a future archive.

Steps and spines, heart rate, and sleep patterns. These are the extractions of FitBits and Lifts. But the role of IoT in objectifying the human subject—the embodied agency of the human—does not end there. There is one final boundary to cross: that of the skin.

Neil Gross, as described in Chapter Two, prognosticated that the earth will don an electronic skin in the twenty-first century. It will do more than that: it will, in donning and therefore becoming bound and defined by skin, pierce the boundary of the body and enfold that which is opened, that which is rendered accessible, in the fabric of its patchwork electronic leathers.

If IoT can be described as a system of systems from which a certain form of objectivist intelligence arises, then those entities (subjects or objects either) that are enrolled into those systems undergo a state change: they become relative, they become enlisted subjects of emergence. So, too, do their subcomponents. The compound object or the subject (perhaps always already complex) becomes a set of components, each of which, in sum, risks inclusion and enrollment in the greater system of systems. The relationality of these systems is key. The First Book of Corinthians comes to mind as a means of exegesis:

> Now the body is not made up of one part but of many. / If the foot should say, "Because I am not a hand, I do not being to the body," it would not for that reason cease to be a part of the body. /And if the ear should say, "Because I am not an eye, I do not belong to the body," it would not for that reason cease to be part of the boy. / If the whole body were an eye, where would the sense of hearing be If the whole body were an ear, where would the sense of smell be? / […] / If they were all one part, where would the body be? (I Corinthians, 12:14-19 [NIV]).

But what of the blood? What of the cell membrane, the mitochondria, the lung, the mesentery, the myelin sheath? What of the connectivity between these bits, the electricity and electrolytes, the nicotinic receptors and the overactive ventral segmental pathway to the nucleus accumbens of the Adderol generation? Each of these the body constitutes through connections: the body is nothing more than connections that allow concert, the creation of a real-time, of synchronization of a means of worldly experience. If the body is connectivity, then I see no reason why the body, then, cannot extend beyond itself in the form of connectivity. But such connectivity, also constitutes an interruption: interlocutors abound. That which was once neatly bundled by the dermis is expanded and augmented through the creation of a foreign, extended dermis.

In the examples of the FitBit and the Lumo Lift, the externality of the body—the body in space—was connected to the IoT-network. IoT, however, does not end at the boundaries of the

body, at the point where the foot meets the pavement, or the slope of the spine prevents a professional impression. It extends beyond the membrane of the skin, through the various layers of dermis, and into that substance that binds us all: “we were all given one Spirit to drink” (I Corinthians, 12:13 [NIV]).

I am not generally one to quote Bible verses. But there is a godliness to IoT: a god’s eye view constructed through reductionist objectivism; a godliness that achieves its apotheosis by means of destruction, a destruction of the unknown, the mystical. This is a destruction that narrativizes, that linearizes, standardizes, and tacitizes by way of a mode of knowing that becomes infrastructural to the human experience. This is an objectivism that constructs a god’s eye view through the selective deletion of that for which it cannot account. That which is known or knowable through reduction is enrolled into a greater body: posture, fitness, data. (By proxy, depression, anxiety, drunkenness, boredom, arousal, too.) Observable data or inferable data. When that observable data is derived from that which is internal to the body, the final boundary between internal and external, between subject and object—the actor and the acted upon—is dissolved.

This dissolution, in IoT, takes the form of blood monitoring.

6.6.1 The iHealth Glucose Monitor

First, it needs to be said that the value of the iHealth glucose monitor—the IoT-enabled device that will be the primary focus of this section—is great. It is not my intention here to throw the baby out with the bathwater: diabetes is a serious condition, and I am sympathetic to the needs of diabetics. The heightened convenience of at-home glucose monitoring is valuable. But, in the context of my argument—that which addresses the transformation of the human from the vantage

of the archive—the means by which this monitoring takes place must be questioned and analyzed. It has effects far beyond reliable and convenient measuring of a medical condition.

The iHealth Smart is the device in question. It is advertised as a 'Wireless Gluco-Monitoring System," with the tagline, 'A Portable, Sharable, Personal Diabetes Data Management System." (It's not much of a tagline, really.) In a way, the addended description of the iHeath Smart neatly summarizes the key tenets of the imaginary of IoT: portable, sharable, personal (and therefore scalable in the context of 'sharable'), data management system. These modifiers add up to a distributed system, predicated on the extraction and analysis of data that pertain to an object in the world that was previously not internet-recognizable. In this case, it just so happens that the object in question is blood: the internal functioning of the body as represented through data collected by an internet-enabled device that crosses the body-environment barrier. Like Intel chips, IoT, in this case, is what's inside.

The iHeath Smart literally penetrates the skin. (See Figure 76.) It does so in order to collect a small blood sample and measure the glucose levels contained therein. This data, literally an extraction of blood—a strange commodity—is then represented on the screen of one's smartphone, tablet, or laptop. (See Figure 77.)

Figure 76. iHealth Smart taking a measurement.

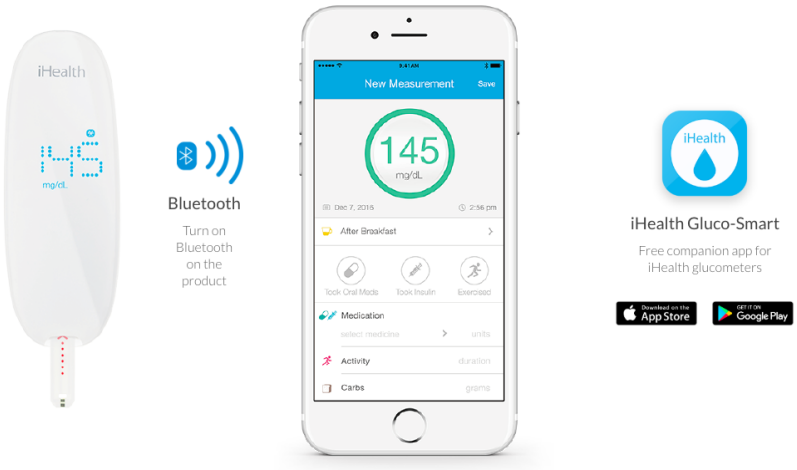

Figure 77. Numerical and color-coded representation of the user's glucose levels.

The internal functions of the body—the locus of agency for the subject—is represented on a screen. This is a longer stride towards the full objectification of the human that we have seen in other intersections of the IoT and the body. From this data, as a result of the metadata appended in the form of meals and possibly in conjunction with activity tracked through FitBit-like devices (IoT is, after all, a system of systems) the human subject is reconfigured as a user and only a user.

They enter the archive in the form of data that has been extracted from them, from their actions, and are represented only as such. Moreover, it is expected that the user, having been reconfigured as such, will adjust their habits based on the feedback of the system. The subject is acted upon by the object: the subject becomes and objectivized-subject, a chimera with one eye of a machine and the other the blue of the human.

If this argument has not yet persuaded, there is still more data to analyze. Consider the prescribed set of actions—bounded by the physicality of the iHealth Smart—that is presented to potential users. (See Figure 78.)

Figure 78. Set of actions for using iHealth Smart.

The imaginary of IoT and the extent to which it crosses the final barrier between the human subject and the object not only plays out in visual representations—as in those examples we saw describing the functionality of smart cities and smart homes—but also in the physicality of the IoT-enabled devices themselves. In Figure 78 (above), we see a set of five steps that the iHealth Smart user is told to follow in order to get a reading on their sugar levels. First, the user is told to, 'Scan test strip bottle and take out a test strip." This act of scanning should remind us of previous

discussions of great networks of objects that exist beyond the habitus of the individual, the subject. To scan a QR code resident on the lid of a bottle is to tacitly acknowledge a great realm of standardization, an infrastructural realm of production and consumption, to which the bottle belongs. It is to acknowledge that the subject, in coupling with the object-bottle to initiate the thinging of the blood, is always already a node in a massive, heterogeneous network of subjects and objects that, derived from what Foucault referred to as the clinical gaze (Foucault, 2012), maintains and defines certain medical conditions as abnormal or (in the case of Canguilhem) pathological (Canguilhem, 2012).

In the second step prescribed in Figure 78, the human subject (having been explicitly enrolled into the heterogeneous network of the clinical gaze through completion of Step One) acts upon a strip that was contained in the QRed jar. She inserts that strip into the iHealth Smart device in preparation for taking a blood reading. Her agency—her actions derived from the set of affordances that arise as a result of the characteristics of her [as subject] and of the strip and monitor [as objects]—is the means by which she crosses over into the realm of chimera: through her own actions, she bridges the last spatial gap between herself and the world of IoT, a space that resides between the strip in the bottle and the IoT-enabled iHealth Smart.

Once the device is loaded with a strip, once it is 'ready to go,' the user is instructed to prick her finger and 'place the test strip into the blood' (Step Three in Figure 78 above). The user is then instructed, in Step Four, to 'Get [her] reading on the LED display and detailed results on [her] smartphone." Simple though it sounds, this step is characterized by proliferation. Data, which exists as as-yet unextracted reality in the blood of the user, is extracted by the strip, which is then analyzed—in the process of capture that translates the world into data-based representations thereof—within the iHealth Smart device. This constitutes the first instance of proliferation. From

there, the device wirelessly transmits further data—metadata—to the user's smartphone. (See Figure 79.)

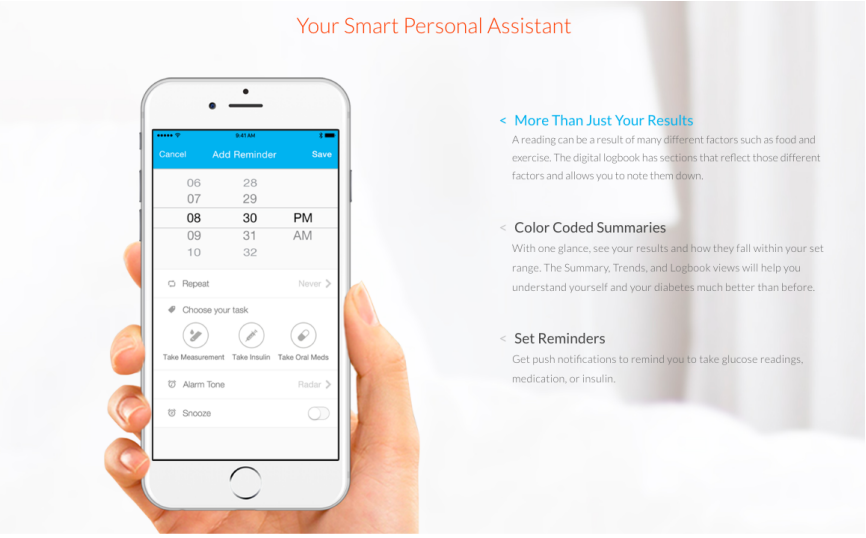

Figure 79. Metadata about the blood.

In Figure 79 (above), we see that it is not only data about one's glucose levels that is presented via the GUI of the smartphone, but rather metadata. Indeed, metadata—data that provides context—is the primary information conveyed. As the text next to the graphic indicates, the user gets more than just results: the user is provided with color coded summaries that lets her 'see [her] results and how they fall within [her] set range. The Summary, Trends, and Logbook views will help [her] understand [herself] and [her] diabetes much better than before."

In the subtle and quick rhetorical move of placing "herself and her diabetes" in the same category—a category defined by that which can be known via extracted data—we see the very breakdown of the ontological barrier that separates the subject from the object. The subject can know herself through the objectification of herself, which, in turn (and according to the rhetoric of Figure X) will allow her to know 'herself' better. One sees a gestalt 'self' emerge from the reading of the relationship between 'herself' and 'her diabetes.' As we will see later—particularly in the

final part of this dissertation—to know oneself, the gestalt result of various self-related facets of embodiment, is to destroy oneself through the process of knowing. But I'm getting ahead of myself.

The text that accompanies the graphic of Figure 79 continues: "A reading can be a result of many different factors such as food and exercise. The digital logbook has sections that reflect those different factors and allows you to note them down." The user, in this case, is as a metadata librarian: data has been collected and she is expected to annotate it. While this annotation is ostensibly for her own good, it seems naive to assume that this metadata will be private in the strictest sense of the word. (More on this in a minute.) In the process of appending metadata to the data that has been extracted, the user both constructs herself as a fuller 'self' (the gestalt described above), but also reduces herself in such a way as to align with the categories of information elicited. (This is not unlike the effects that the ICD have on the notion of the human. [cf. Bowker & Star, 2000].) The self that is constructed through the addition of metadata can in no way be interpreted to be representative of the user in full. While this is not necessarily a problem in relation to the iHealth Smart, it certainly becomes a problem when this notion of metadata and amendment is applied to a greater network of IoT devices: to the electronic skin of the earth. If the metadata appended in any given user scenario is not representative of the gestalt subject, then there is no reason to believe that any amalgamation of appended metadata derived from multiple even myriad scenarios will ever add up to a fully representative description of the gestalt self. The very process of amalgamating data, then, can be seen as a reductive process that concretizes a vision/version of the self that is, itself, reductive.

Despite the fact that the next step prescribed in Figure 79 instructs the user to eject the strip from the device, the proliferation does not end there. That is, that which has been extracted, does

not end its journey in the IoT-enabled network with the click of a button. Rather, its journey just begins. In another graphic contained on the iHealth Smart website, data collected (extracted) from the blood of the user is further circulated via wireless connections. (See Figure 80.)

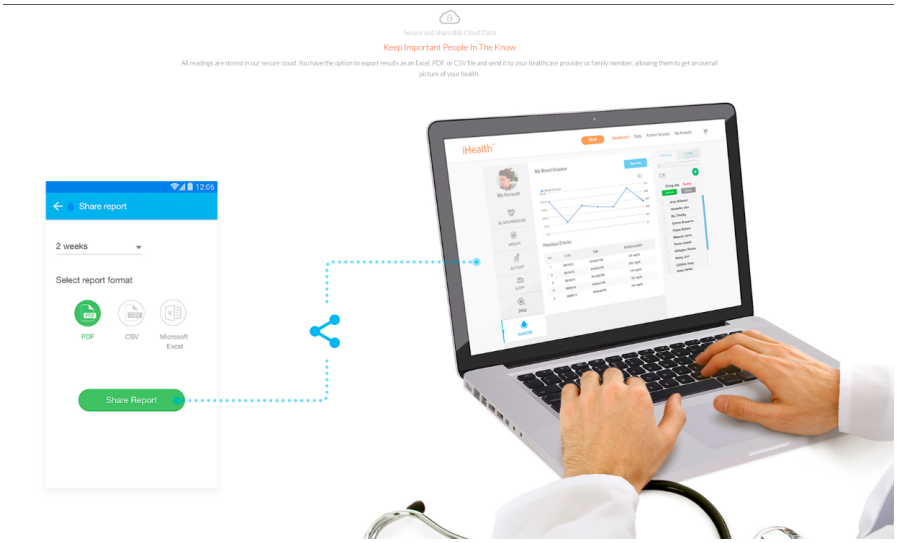

Figure 80. Sharing data.

In Figure 80 (above), one sees the implicit and explicit potentials for sharing blood borne data. The user is encouraged to share a report of their various extraction-based readouts with their doctor. (Although the doctor is not directly referred to, their presence is apparent by the white lab coat that brushes the wrists of the computer user at the right side of the frame.) Where this sharing becomes interesting is when one considers the vast infrastructure required to validate the extracted data. This is not necessarily an infrastructure of wireless signals, code, and pixels—although those are implicated, too—but rather an infrastructure of taxonomy and standardization, an infrastructural of the clinical gaze and those contributions or representations of data that can be included in the clinical gaze. In a way, the sharing of this data harkens its own discursive transformation: if, as was argued by Foucault, the clinical gaze constitutes its own topology of the archive—a set of discourses that in combination add up to the clinical gaze, a gaze that medicalizes

and objectifies, but notably without the same day-to-day feedback as that which is implied in IoT—then the validity of iHealth Smart readouts (i.e., their acceptance into the constitution of the clinical gaze) connotes a discursive transformation. New statements are possible, where statements do not begin and end with the sugar counts, but extend to include the situations in which such counts are taken and the gadgets used to collect such counts. The patient—the construction of the clinical gaze—is no longer solely constructed within the confines of the hospital, the asylum, or the doctor's office. Instead, the patient spreads out into the world beyond the hospital walls; the patient colonizes the umwelt of the subject, transforming the subject into a patient first and foremost, regardless of the environment in which they find themselves. In this way, we see that the futures of IoT—at least in the case of medical-related IoT—indicate a partial if not complete transformation of the subject into a subject-object chimera. Whereas the patient was formerly only a patient—and therefore an object constructed via the clinical gaze—in certain scenarios bounded by physicality, temporality, and placeness, the patient is now the patient wherever and whenever they carry with them the iHealth Smart.

Given that the data extracted via use of the iHealth Smart is intended to be shared, we can surmise that it will be shared with other entities than a doctor or a lab tech. (Even if the actual data pertaining to blood sugar levels is not the data that is shared, one assumes that the purchase history of the device is shared, the metadata generated by the smartphone used to run the iHealth app is to be shared, etc.) In this way, the user, who is initially only objectified through their status as 'patient' becomes potentially objectified in terms of the subject-entities that utilize data adjacent to the glucose readings. In enrolling into a single facet of IoT, the user potentially enrolls into all facets: such is the nature of engaging with a system that is intended to be a system within a 'system

of systems.' The objectivity of the user—their transformation from subject to object—grows with every membership in a network that leverages data extracted from them.

In being a system of systems, IoT is also a subdivision of components. It is a relativistic network that assembles and disassembles. The blood, in this case, is disassembled from the body, its characteristics extracted and translated into the form of data. It is enrolled into the imaginary of IoT by the very process of extraction that renders it representable via IoT. But IoT does not end its subdivision and enrollment, its divide and conquer modus operandi, at the locus of the blood. It penetrates elsewhere, too. (One needs only harken back to the example of the WeVibe to catch my drift. [NB: the topic of IoT-enabled devices in the realm of sextech is a rich one. Although it is rich enough to warrant in-depth discussion here, I have chosen to reserve that discussion for another manuscript for reasons of length]) Suffice to say, IoT objectifies the body and its constituent parts, be they the foot, they eye, the hand, the ear, the blood, or the sexual organs.

In the act of extraction that gives representation to bodily bits via IoT, one finds promise: not only a promise of efficiency or efficacy relative to the problem directly addressed by extraction, but also the promise of standing reserve (Heidegger, 1977). Once data is extracted it achieves a state of standing reserve: it becomes the nail to the hammer of knowledge production.

It requires no mental gymnastics to see the link between this emergence of data-as-standing-reserve and the notion that theory is dead (Flusser, 2015b). The sheer availability of data—and data that touches upon or is derived from myriad aspects of the phenomenological world—tempts one to see a map truly representative of a territory. But, as I have said earlier, the map that IoT creates is not unidirectional: it is not a map intended to describe the world from which it is derived.

Rather, it is a map that feeds back into the territory it describes, thus changing that territory. It is a projective map, a prescriptive and proscriptive map.

When IoT invades the blood, when it crosses the final barrier between the human subject and the world of objects without, it forebodes a foregone conclusion: the idea that we can fully know the world. The problem with this foregone conclusion is an absence, a spectrality: the world as it was once known can no longer exist once the extraction so central to IoT becomes pervasive. At the point at which the earth dons an electronic skin, and in so donning enfolds the human subject in the fabric of reductionist objectivism so easily and invisibly achieved through IoT-enabled devices, worlds are implicitly destroyed. That which once was can no longer be but through the lens of what is.

When *what is* is defined by the data made available through extraction, then the world—the archive of the world and the world-as-archive—becomes little more than a peepshow seen through a small window. The archive evolves through violence, and in so evolving, produces a new world: a world where that which is not derived from the processes of extraction underlying IoT cannot be considered relevant. In this world, this future of IoT, one finds a human subject that is no longer a subject alone. Instead, one finds a human that is both subject and object, the source of extracted data and the subject that acts in relation to the knowledge (algorithmically) produced via extracted data. The human-as-subject in the world of IoT, then, exists as a recursive error predicated on the boundaries of what has been extracted: predicated on that which can be extracted, and in being extracted, nullifies the validity, the relevance, of that which cannot.

In the futures of IoT I have presented in Chapters Five and Six, we have seen a pervasive shift towards thinging. By ‘thinging’ I mean the creation of sets of actionable possibilities achieved through the coupling of subjects and objects. I have also demonstrated that ‘coupling’ is not

necessarily the appropriate term: the gathering of subjects and objects that produce things within the imaginary of IoT is not relegated to dyadic composition. Corporations and their constituents loom in the background of any subject-to-object thinging. The data itself, extracted from the phenomenal world, becomes an actant unto itself. It becomes its own chimerical hybrid of subject and object, the lovechild of the thing, if you will. It takes on its own subject and object characteristics, which are predicated on the extent to which they, in being extractions, might be used—like a nail to the hammer of computerized empiricism—in the production of other things that reside slightly further along in the futures of IoT, slightly deeper down the rabbit hole.

It is here, at the point where we now begin to a process of speculative deduction as to what it might mean to be a human (a subject/object chimera) in the future of IoT that it becomes germane to dive deeply into the theory of the archive. I opened this dissertation with a meditation of the narrative structure and irreducibility of the archive. I will end it in a similar space, but a space that has been defined by those findings I have presented in the course of the ensuing chapters.

6.7 Discourses in the Mist: Summarizing the Discourses of IoT

As we have seen through the analysis of videos and texts that describe the imaginary of IoT at the scale of the city, the home, and the body, the imaginary of IoT is foundationally an imaginary of connectivity despite heterogeneity. As a result of this connectivity, the notion of heterogeneity comes into question. It is possible—and I think evident—that core aspects of heterogeneity, such as the ontological differences between the subject and the object, are dissolving. The subject when coupled with an IoT-enabled object to produce a thing is no longer purely a subject. Nor is the IoT-enabled object purely an object, but rather a sort of prosthetic or proxy subject. It acts, and the subject-user is acted upon.

Several hundred pages into this work, and prior to the beginning of the final part, it is now germane to undertake a revision. To this end, I will summarize the flow of empirical work (that contained in the present part, Part II).

We began with approaching the discourses active in the imaginary of IoT via topic modeling. Ten topics were derived from the analysis of tweets user-indexed with IoT-related hashtags. Many of these tweets were posted in direct relation to two IoT-industry conferences. From these tweets and the analysis thereof, I demonstrated that the discourse of the future is central to the discursive constellation of IoT. Moreover, the discourse of the future was colored with tints of mediation: videos, blogs, reading. I then surmised that the future of IoT is constructed, communicated, augmented and maintained through the creation and circulation of communicative artifacts. These artifacts take the form of digitally inflected texts and videos. (Anther findings from the topic modeling included indications of a change in corporate personhood.)

As a means of analyzing the process by which the future is constructed via communicative artifacts, I began analysis of promotional materials related to IoT. In Chapter Five, we saw videos from Intel and Sony that depicted idealized visions of IoT at the scale of the city and the home, respectively. The analysis of these videos, as well as their related textual material, constituted a relatively deep dive into the sixth topic presented in Chapter Four: that which dealt with mediation and the future.

In analyzing these materials, I demonstrated that several discourses intermingle in order to evidence the transformation of the human by way of a change in the ontological status of subjects and objects: scalability (e.g., the creation of systems of systems); intelligence (and the locus, agency, and epistemological underpinnings thereof); extraction (and therefore objectification of the user); and representation (which I have largely discussed in terms of the Flusserian construct

of the technical image). Each of these discourses interact—as in a system of discourses within a greater set—to construct the boundaries of futures represented in the imaginary of IoT, and therefore to limn the potential futures of the human transformed.

I have demonstrated that via a change in the constellation of subjects and objects that gather to produce a thing, the very discourse of the thing is changed. As the discourse of the thing constitutes the meeting point of subjects and objects—users and devices—within the imaginary of IoT, any change in the discourse of things must potentiate a change in the discourse of the human. Indeed, it is my conclusion that in the present historical *a priori*—an historical *a priori* from which is presently emerging another, what Geoffrey C. Bowker has referred to as the age of potential memory—the discourse of the human and the thing are so intertwined that they are fundamentally inseparable. To be a human is to co-construct things with the objects that populate our environment, whether they be theoretically framed as natural or artificial. I have further concluded that the emerging historical *a priori* heralded by the imaginary of IoT is one in which the ontological bifurcations through which the modern age reached its maturity (and death), are changing in basic ways: these bifurcations, resulting in biune conceptual structures (e.g., the dichotomy of natural and artificial, subject and object, human and posthuman) are transforming in such a way that the ontological membrane that effects the bifurcation is expanding to comprise a third category: the biune has become the triune. This third category is one of instability, of transformation wherein subjects appear as objects, objects as subjects, the natural as artificial, and the artificial as the natural. The extent to which these dichotomous discursive components resemble themselves or their counterparts depends on the vantage from which one analyzes them.

In an imaginary characterized by the construction of complex and compound systems—systems within systems—this perspectivally-grounded ontological fluidity is to be expected. As I

am not in the business of predictions, and I have no crystal ball or tea leaves to hand, I make no concrete predictions as to the way these transformations will impact the experience of the mundane. That is, I do not predict jetpacks or flying cars; or the proliferation and commonplace status of robotic kitchens, the emergence of spimes, biots, or wranglers. Rather, my forecast extends only this far (which is quite far enough): we will no longer be ourselves as we know ourselves. To be human—couched as such a notion is in the West with ideas of irrational actions, individuality, the flaneur, the wanderer, the wayward collector—will not only mean to act, but to be acted upon. What's more, to be acted upon entails a willingness, a giving over. It requires an acquiescence, the ultimate (if tacit) end user license agreement. In this particular ULA, signed through the act of enrollment and the subtle naturalizing effacement of those developmental steps that brought us here, we agree to enter a new world, a speculative world, a world of quantum realism, of relativist realism. This is not the world of the singularity, nor of GOFAI realized. Rather it is a world where we, as humans nee subjects, mature into an infancy once again: where, through reliance on and belief in the value of prostheses which from us extract data so that we might know ourselves better, we retreat into a second iteration of self-imposed nonage: a nonage of defined by multiplicities, recursion, and an absence of knowing that comes from colonial data-turned-information, like a view from command line windows that sees no trees in the forest.

The Internet of Things is not about knowing where devices are, or in what quantity they reside in a certain place. Nor is it about knowing every aspect of the composition of an object, or every change in temperature, elevation, location, etc., that an object undergoes. IoT is about people: more specifically it is about the objectification of people, the creation of a new breed of chimeric subjects and objects that evidence characteristics associated with their (formerly) mutually exclusive

complementary categories. Objects begin to look like subjects; subjects begin to look like objects. When subjects begin to look and act like objects, then the very discourse of 'the human' has changed.

We unknowingly effect our own de-subjectification, our own transformation of the human, by enrolling into the world of IoT through the act of purchasing such devices as smartphones, FitBits, Roombas, automobiles, smart lightbulbs. Each of these IoT-enabled devices performs a function relative to the purchaser: indeed, and in most cases, the purchaser feels that the functions performed are beneficial to them. The floor stays free of cat hair; my resting heart rate improves because I monitor my daily activity; my car avoids an accident with the drunk driver in front of me; I can send a quick text message to my committee chair telling him that I'm running two minutes late to a meeting. But in the act of engaging with these devices, the user offers themselves as a mine: a mine of potential data. The subject becomes and object by presenting herself as a site of extraction, as a source of data that will, when analyzed, reveal something about her person, her environment, or her behaviors.

Data objectifies. The collection of data takes a worldly phenomenon and translates it into a representation. The representation is the object of study. In networking ourselves—defined to a large extent by the things we choose to co-comprise—via coupling with IoT-enabled devices, we effect our own humanistic demise, a shift in the historical *a priori* that has not yet fully been realized. The human is no longer the unknowable, the sublime. The human is known through its objects, as an object of its objects. We render ourselves silhouettes unburdened by the experience of missing what is (or was once) at our core: those non-datafied behaviors: driving to get lost; reading a book in a coffeeshop instead of doing the yard work; taking a break from the gym and sitting on the couch. We are constructed through our own willingness to provide data in service to

the convenience of 'knowing' that as not humans, but Internet-enabled humans augmented and reduced by the prosthetic sensing devices that we think we need. We reach through the screens of the imaginary to become ourselves anew.

None of this truly heralds the end of the human. (Our own ecological negligence will do that for us. Or maybe an asteroid. Or maybe fascism 2.0.) What it does herald is a new historical *a priori*. A new epoch. This epoch will be one wherein the 'Thing' truly is a gathering again, but a gathering that transforms a dichotomy (subjects and objects) into a trichotomy (subjects, chimeras, and objects), and finally a monotony: chimeras.

This deserves further exploration, and I will explore it through Bowker's (2005) notion of the age of potential memory. For Bowker, the function of the emerging archive is not entirely to remember events or statements, but to store everything that might be reassembled into a statement or event. It's a bit like the different between the just-in-case model of library collections or the just-in-time model of production. Whereas the just-in-time model relies on distributed holdings—a lack of redundancy—the just-in-case model is a model of hoarding. The librarian accessions everything under the sun just in case a patron might want it. In the age of potential memory, the archive collects everything: every digital trace, anyway. There is not necessarily purpose for this collecting, but the collecting itself. The data swallowed into the archive resides there for potential use. This is also the way with the extraction of data so central to the imaginary of IoT. Data are collected just in case, in some future scenario, they might be useful. I will discuss this in greater detail in Part Three of this dissertation. For the moment, it is worth bearing in mind.

We are—right this very moment!—witness to an archival breakage, a point of disconnect. The One becomes The Other, and we, in this fleeing moment, are both. We are chimeras with one eye

analog and the other digital, who will give birth to generations that see through only digital eyes, prosthetics that will become naturalized.

6.7.1 Objectification of the Body

In sections above, I devoted quite a bit of discussion to the nature of the subject-object dichotomy—the construction of the 'thing'—in the context of FitBit devices. As further evidence of the object-characteristics that colonize the subject, the human user, I draw your attention to the tracking that occurs when one accesses their FitBit dashboard using a web browser. Using the Ghostery in-browser application, no fewer than thirty-seven trackers are identified. Based on the list of trackers provided by Ghostery (access date December 7, 2018), information is sent to: nine advertising trackers (DoubleClick, Bing Ads, Google AdWords Conversion, DoubleClick Floodlight, Drawbridge, Facebook Custom Audience, Google Dynamic Remarketing, DoubleClick Exchange-Buyer, and TV Squared); one customer interaction tracker (KissInsights; two 'essential' trackers (Evidon Site Notice, Google Tag Manager); five site analytics trackers (Google Analytics, MixPanel, SessionCam, Pinterest Conversion Tracker, GA Audiences); and two social media trackers (Facebook Connect and Pinterest).

I point out and enumerate the trackers that are activated when one accesses their FitBit dashboard through a web browser not to induce panic or make some kind of moral judgement or statement about privacy. Rather, I do so to highlight the extent to which the coupling of a subject and an object (in this case me, a user, and a web browser that I use to understand another subject-object coupling—that which occurs at the level of my wrist and my FitBit Charge 2) is no longer just a dyadic formation. That is, in creating the 'thing' that is my relationship to the FitBit dashboard online, I surely constitute a definable and limited subject; but the object with which I

couple does not function as a pure object, but rather a proxy for various subjects that reside behind it.

It is not my intention here to assign the status of a subject to an algorithm such as those that are undoubtedly used to make sense of what is being tracked. Instead, I ask you to look one step beyond that algorithm to the institutional entities, corporate subjects that will make use of this data. Even if we assume that all of the data and metadata that is conveyed through the thirty-some trackers active on the FitBit dashboard page are used solely for the purpose of placing ads within your line of vision, the point is the same: the object with which I couple to produce a thing that tells me about another thing becomes a transition point: it serves as a proxy subject, and in so serving, effects an infrastructural inversion: I am not purely the subject-user in this particular construction of a thing; I am also, by way of my relation to the subjects that make us of object-gathered data, also an object. In enrolling in the technical ecology of FitBit, I enroll not only as an embodied person who hopes to monitor and therefore improve his physical health, but I am an object in the construction of another 'thing': I am an object represented by a reductionist set of data to which other subjects (e.g., advertising and marketing firms) will utilize in the future construction of yet another thing: a successful advertisement, or a successful purchase.

In order to explore this conversion from a pure subject to a chimeric blend of subject and object, let's consider an example: that of the Skip-It. The Skip-It was a children's toy that emerged in the 1980s, manufactured by Tiger Toys, a division of a company called Tiger Electronics. It looked like a ball-and-chain that one might expect to see in illustrations of pirate prisons. On one end, one would find a loop that would be wrapped around the ankle. On the other end, a sphere. Once attached to the ankle, the toy was rotated around in a circle, an orbit around the ankle to which it was tethered. The point of its use—an early, consumerist attempt at gamifying fitness—

was to count the number of times you could skip over the orbiting orb. The higher the number, the better.

The Skip-It does pretty much the same thing as a basic pedometer: it counts. (It also happens to be a slightly more fun example than a pedometer.) But the relationship between the child and the Skip-It differs significantly from the relationship between a FitBit user and their FitBit. It differs through the number of subjects that are coupled with a given object. The Skip-It did not (and could not!) transmit any data about how many skips you managed before tripping and landing on your face. The network of subjects and objects that were involved in the 'thinging' of the Skip-It was comprised of two nodes. If the Skip-It were to be digitally networked with Hasbro, the makers of the toy, then the network would consist of three nodes: the subject-user, the object-used, and another subject-user (Tiger Electronics). Tiger Electronics would become an implicit subject-user in this network because of the act of data collection and transmission: data is never only collected for the sake of collection. The collection of data implies a use for that data.

Focusing again on the example of the FitBit dashboard, one must wonder what specific data are shared not only through the trackers that are identified in a browser setting, but through the actual use of the application. Each of the parties that gain access to data about the FitBit user is a potential subject that, by means of the interlocutor-object (i.e., the FitBit), transforms the human-user, the subject, into an object of use. Beyond the mired concerns about privacy—an outdated construct—this objectification of the subject comes with major implications for the experience of being human on the temporal level of the day-to-day.

6.7.2 Objectification in the Smart Home

Scaling up from the level of the body, at which FitBit devices are most clearly active, consider the role of this infrastructural inversion in the case of the smart home.

Compare the 'Movie Night' scenario discussed in Chapter Five. In my description and analysis of this advertisement, in which a family gathers for a movie night with the use of their smart home, I paid particular attention to the term 'discover.' Recall that I argued that 'discovery' is not generally a positive term when considering the context of the home: the home, by virtue of its ontological transition from a house to a home, is a known space. It is a space of comfort wherein one is surrounded by the objects they choose.

'Discovery,' when read closely and in terms of subsequent analyses, alludes to the presence of unknown subjects in the composition of 'things' in the smart home. The additional subjects present in formerly dyadic things is reminiscent of the notion of 'fluid assemblages' put forth by Redström and Wiltse (2018). But there are reminiscent only in the extended implications of the term 'fluid assemblage.' Where, for Redström and Wiltse, the fluidity assemblages has as much to do with such phenomena as the technical and configurable malleability of objects—say, for example, a smart phone that runs an operating system, applications, etc.—in the present context such fluidity must also encompass the actants, or removed subjects, that are responsible for interpreting data or for the control of systems that interpret data.

In some ways, the creation of smart home is also the dissolution of the home itself. Where once 'home' referred not only to the structure or physical location of a person's residence but also, according to the Oxford English Dictionary, 'the seat of domestic life and interests,' the home embedded with smart objects extends itself beyond that definition. Rather than being a personal

space isolated from all but the familial or individual, the home becomes porous: it becomes a liminal space between isolation and society. Much can be read of this new home in terms of Gross's statement pertaining to the Earth's electronic skin.

The placeness of the home is moved by the notion of the construction of the smart home. The smart home resides in an interstitial space between two related, but opposed concepts: the home as insular and the home as expansive. Given that the design of smart objects, or any objects of greater functional complexity, is often achieved through the appearance of simplicity (Redström & Wiltse, 2018), the transformation from the home to the smart home is an insidious one. Indeed, one might expect the 'smart' modifier to be dropped from 'smart home' in the near future — not unlike the term 'digital' in reference to libraries. Once such a change is effected, it is likely that, to borrow phrasing from Bruce Sterling, the line of no return will be crossed: it will be impossible to revert to the historical *a priori* in which a home was always already unsmart, or purely analog.

6.7.3 On Representational Inconsistencies

The presence of inconsistencies in the various advertising materials I have described in this chapter requires some careful thought. At first, it seems reasonable to chalk these inconsistencies up to the breakneck speed of the professional advertising world, as well as cost-cutting measures that likely led to one advertisement using copy derived from multiple different projects. In either case, the inconsistencies identified and described above provide subtle and meaningful evidence of the maintenance and negotiation that undergird the various imaginaries of IoT.

Most important of these inconsistencies is the appearance of Shannon's desktop screen in the FitBit Zip video. Recall that the screen was presented to illustrate Shannon's action of checking the badges she'd earned through using her Zip, but that the background material represented on

the screen seemed to be directly related to the creation of FitBit advertising materials. The overall effect is something like going through the looking glass; the careful viewer finds themselves in a realm wherein the use of a Zip is real, but the construction of the materials that enroll potential users are also real and are in the process of construction. In the form of these overlapping temporalities of IoT, wherein the FitBit Zip is at once a realized and usable device, but is also (simultaneously) constructed and maintained through the creation of advertising materials, we see an IoT that is unstable. That is, we see an IoT that is both real and imagined, where its imagined forms reside on the same machine that is used to view the Zip's output. We come, by way of Shannon's desktop, to a realm wherein the imaginary of IoT as it is partially represented by a FitBit Zip is reconciled across multiple temporalities: it is constructed and becoming, rather than received and fully known.

6.7.4 Screens Within a Screen

If the screen is the material instantiation of the image-as-thing in IoT, it is also a window through which one sees technical images, or limns of technical images (which, themselves, might be said to only exist in a spectral way). There is an odd algebra involved here, and it presents in the form of recursion. The screen presents the film; the film contains images of the screen; the filmed screen then becomes a technical image within an image-as-thing: it becomes an auxiliary set of potential futures contained within the world of the image-as-thing. The technical images presented in screens within screens cancel the screen out: the technical image contained within the screen within a screen becomes the image beyond the screen: it becomes the present tense, the phenomenal world from which the image-as-thing was constructed. It becomes the doorway, or the blueprint of a doorway, through which the viewer might enter into the ontological status of the

user. In so entering, the viewer becomes a hybrid of subject and object: they become the subject that views and the object that is viewed.

Recursion pervades much of the film-based material that represents or constructs through representation the possible imaginaries of IoT. Screens—those through which we view the imaginaries, including television, tablets, smartphones, laptops—beget screens upon which one finds visualizations of data or protocols for algorithmic behavior like shades being drawn over windows to facilitate appropriate ambient lighting for family movie night, or lights and televisions turning off while smart thermostats adjust temperatures set to a user's preferences for sleeping.

These screens within screens—or indeed, these various drafts of icons and disappearing standards—are as plays within play; but these internal plays, these screens of the imaginary that present as representations on the screen-objects with which we interact in real-time, take on a reciprocal relationship with veracity: these screens within screens provide glimpses in to a reality, a lived temporality of praxis and design that begets the imaginary, the enrolling materials of which present glimpses into a constructed past. The space between these mixed temporalities, when considered simultaneously from the vantage of a user, a viewer of the screen presenting the screen, comprise in total a long present tense.

The screen within the screen, the mechanism by which Hamlet watches an ancient murder echoing across past tenses to the present to resonate with his own recent patriarchal regicide, presents our pasts as much as it does our future: it presents the archive from which the possible futures of IoT arise, even as they are represented in through mockups, carefully curated user scenarios, may arise: the discrepancy between the past and the present, the screen within the screen, provides initial evidence to support the hypothesis that discursive transformation within the archive occurs, at least in part, as a result of material transformations or translations.

But Shakespeare's famous play within a play (*mise en abyme*) is not the only cultural artifact with which our nested screens resonate. On the one hand, one recalls the use of The Beatles' 'She Loves You, Yeah, Yeah, Yeah' at the end of 'All You Need is Love' (itself the first televised, transatlantic live broadcast); on the other, one thinks of The Who's use of 'The Kids Are Alright' in the greater context of the album *Quadrophenia*. (Countless other examples exist in contemporary music, given the prominence of the 'Amen Break' in sample-based music ranging from Chicago House and 18th Street Lounge to jungle, drum'n'bass, and all forms of hip hop.) In each of these instances, as with the screen within a screen, the viewer or listener—the user, broadly—encounters the point at which that which was is enrolled into that which is—the point at which what has been is decontextualized and rendered anew, subtly or not-so-subtly different through its association with new contexts or new materials.

In a cleaner formulation, one might envision two sets. These sets, say ***A*** and ***B***, overlap somewhat. That is, certain points contained in Set ***A*** are also contained in Set ***B***; similarly certain points in Set ***A*** are not contained in Set ***B***; the same is true of Set ***B*** relative to ***A***. Let us imagine that these two sets are heterogeneous in their contents: that is, their contents range from cultural practices, to material forms of communication, to records of statements, to possible statements. Let us also imagine that Set ***A*** existed as a set prior to Set ***B***, and that Set ***B*** is partially derived from Set ***A***. So far, so good. We are able to envision two sets that share certain unisons.

But what if we take this metaphor one step further? What if we assume that Set ***A*** and Set ***B*** are, in fact, the same set? If Set ***B*** appears to contain even one item not present in Set ***A***, they cannot be said to be unisons. Can they?

Yes. Despite initial appearances—in the case of the screen within a screen, the notion that some new device is presented thus defining the container screen and its context as Set ***B***—it is

possible to argue that Set ***B*** was always already present in Set ***A***. That its contents were always present as components of the set, but that the topological presentation of Set ***A***, the ways in which its components are rendered visible in a given configuration (i.e., Internet 1.0), simply rendered the deceptively novel components of Set ***B*** invisible, or occluded. Put differently, any one topological transformation of a set of discursive potentials, by way of the subjectivity required to perceive of such a set's existence in the form an historical *a priori*, necessarily renders other potential transformations invisible. It is the point at which transformation occur that renders Set ***A*** and Set ***B*** subsets of an even great set, an archival set: a set of L'Un et L'Autre, of jussive and sequential violences, of, in short, the organized world of the sociotechnical as it exists across time.

6.7.5 It's Not all Doom and Gloom

Up to this point in the present section, I have painted the objectification of the human in a mostly negative light. But it is not all bad news. The objectification of the human occurs as a result of the Information Age and the tendency towards big data: the human becomes little more than a producer of data. This data can, in fact, be beneficial. It has the potential to open ourselves up to ourselves.

Perhaps nowhere is this more apparent than in recommender systems as they pertain to art—that most human of endeavors, the production of which is no less inherent to the experience of 'the human' than the drive to classify. In the present tense, Goodreads and Amazon recommend books based on my browsing history. Perhaps in the future recommendations will be made in a more nuanced fashion, based, perhaps, on the GPS-verified location of my credit card when I travel to Norway; or the purchasing history associated with my grocery orders; or the database that locates

and represents the stores the line the streets down which I walk, the highways I drive; or based on an algorithmic deconstruction of my interests.

In this regard, the n-adic composition of 'things' in IoT makes us somewhat more human than we were. In its potential to introduce us to new aesthetics, new artistic experience, the 'thing' in IoT also points towards the production of new art forms: just as (digital) sampling technologies gave rise (in-part) to whole genres of music, including but not limited to jungle, drum'n'bass, and hip-hop, the increased awareness of extant forms of art and exposure to them might catalyze the production of new genres not just of one given mode of artistic expression, but novel modes that hybridize and combine.

In a fascinating plenary address for the conference, Envisioning Robots in Society, Simon Penny reminded his audience that the practice of anthropomorphosis is as old as art itself (Penny, 2018). The classical statues that we all know, white and austere when they come to mind, were once brilliantly painted, often with precious stones used to mimic the eyes. We continue this practice of anthropomorphosis into the present tense through the creation of robots—perhaps the most glaring example is sexbots.

But what if our drive to anthropomorphize through art could be interpreted differently, not as a desire to make objects more like us, but to make ourselves more like objects?

We create representations of ourselves so as to know ourselves, but in creating representations, we come to know ourselves not through ourselves, but through those external objects. We transfer certain human characteristics to objects in order to reflect ourselves. Following this line of logic, then, it might be said that in coupling with object to produce things—the things of the Internet of

Things—we are coming full circle, or perhaps realizing a long-held goal: to render ourselves as objects, to break the final barrier of the skin so as to be members in the world beyond ourselves.

We are, undoubtedly, facing a transformation of the human. This transformation, I have argued, occurs via the transformation of the thing. We become differently human through our ablative relationship with the objects that populate our environments, and through the compatible characteristics we have with those objects. We live through things, in things, by things. If, in co-constituting the thing by coupling with an object, we take on characteristics of the object with which we couple, then so be it.

It is tempting to argue—as it is an easy (if not lazy) argument to make—that we are killing ourselves as we have come to know ourselves; that in objectifying ourselves through continued and extended engagement with objects that extract data from us so as to produce knowledge about us, we cease to be ourselves. That we are ceasing to be ourselves through our continued and rampant adoption of IoT technologies is undeniable: it is, however, not wholly accurate to argue that this is overall detrimental to the human. There is no inherent ethical or moral or aesthetic valence to this change: only an ontological change and an epistemological change. We are coming to know ourselves in ways that we have not previously known ourselves. These ways, by and large with regard to IoT, occur via the production of things and the creation of a third category resident between the categories of subject and object.

Let's consider the emergence of this third category via the myth of Narcissus. A brief refresher:

> There was a clear fountain, with water like silver to which the shepherds never drove their flocks, nor the mountain goats resorted, nor any of the beasts of the forests; neither was it defaced with fallen leaves or branches, but the grass grew fresh around it, and the rocks sheltered it from the sun. Hither came one day [Narcissus] fatigued with hunting, heated and thirsty. He stooped down to drink, and saw his own image in the water; he thought it was some beautiful water-spirit living in the fountain. He stood gazing with admiration at those bright eyes, those locks curled like the locks of Bacchus or Apollo, the rounded cheeks, the ivory

> neck, the parted lips, and the glow of health and exercise all over. He fell in love with himself. He brought his lips near to take a kiss; he plunged his arms in to embrace the beloved object. It fled at the touch, but returned again after a moment and renewed the fascination. He could not tear himself away; he lost all thought of food or rest, while he hovered over the brink of the fountain gazing upon his own image. […] His tears fell into the water and disturbed the image. As he saw it depart, he exclaimed, 'Stay, I entreat you! Let me at least gaze upon you, if I may not touch." With this and much more of the same kind, he cherished the flame that consumed him, so that by degrees he lost his colour, his vigour, and the beauty which formerly had so charmed the nymph Echo. […] He pined away and died (Bulfinch, 1998, p95-96).

In this fable, as Bulfinch called it, Narcissus falls in love with his own image. (His fate to so love himself was a punishment for shunning the many nymphs who loved him.) This is, I think, well known. It has been the subject of a few satire-news stories in various corners of the Internet. (I recall one, for example, where Narcissus opens an Instagram account.) It has even been the subject of some Photoshop work, although the creator of the image is not cited. (See Figure 81.)

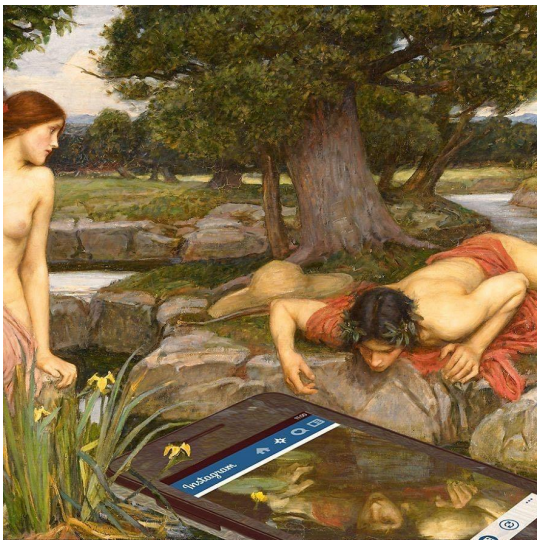

Figure 81. "21st Century Narcissist [sic]" (posted to Reddit by 'BattlefieldBastard'. https://www.reddit.com/r/pics/comments/4kek55/21st_century_narcissist/)

Although it has clearly served fodder for humor, there is more to interpreting the myth of Narcissus in terms of the 21st century than just a few laughs. It deserves careful reanalysis in terms of the transformation of the human. The subject is not the subject anymore, but always already in a future of IoT, the subject is at least part object. The transformed human, by being defined via the ablative nature of the objects through which and by means of which we know the world (and ourselves in the world) has become a Narcissus with longevity.

I have argued above that the subject coupled with an IoT-enabled object to produce the sort of thing upon which IoT is predicated exists in a feedback loop with an image of herself. This image, again, is one constructed via data that has been extracted from her behaviors via the construction of the thing. This feedback loop between the technical image of the subject and the actual subject constitutes a happier ending for poor old Narcissus: would that his reflection had spoken! But if his reflection, the literal object of his affection had been a modern object, an extractive object, it would have spoken back: it would have spoken back in the form of operant conditioning, of updates and messages, of step counts, heart rates, and reminders to stand up straight. In short, Narcissus would have been able to interact with his own image, the object that contained his image.

But the rereading goes further. There is, in the surface of the lake, the desire to see ourselves in nature—or, rather, to see ourselves in the objects that populate our environments. This is the standard reading of anthropomorphosis put forth by Penny (Penny, 2018). But it becomes possible see anthropomorphosis from the other side of the coin: it is not our desire to make our objects look like us, but rather our desire to become more ourselves through the objects in our environments, and in so doing, to become more like objects ourselves.

Consider the description of the pond. This is a perfect pond. It is a pond without excrement, without ripple, without animals drinking, mosquitos, the smell of scum, without tires and boots

waiting for the fisherman's line. It is a lake without fisherman and therefore a lake without man. It is a silver pond in a golden place. It is, in short, an idealized pond; a prototypal pond. In being so idealized, in being so prototypal, it is a pond that is the result of an empirical acquaintance with the phenomenon of ponds. (One cannot imagine a perfect pond without being familiar with those qualities that would make it imperfect.) It is rendered so perfectly, so virginally, precisely because we know that ponds are not this way. The pond, therefore, might be seen to represent a perfect nature: a perfect environment of objects. Narcissus wants to belong to this realm of perfection. For his love story to find a happy ending, he would need to be an object himself.

In seeing his reflection in the pond and falling in love with it, one sees an opportunity for a radical rereading: it is not necessarily that Narcissus has fallen in love with himself as he is represented in the lake, but rather the he has fallen in love with the possibility of being represented in such a perfect lake.

I'll put it differently: Narcissus sees himself in the ideal of a lake. He sees himself reflected in the perfection of the known (and therefore natural) world. In seeing himself there, he falls in love not with his reflection but with the urge to become natural and known himself: to be as studied and prototypal as the very lake in which he reflection resides. His love and his longing can be interpreted—albeit solely in terms of the current historical *a priori* and not that of the Ancient Greeks—as a desire to be known, to be naturalized, to be objectified. He does not want to render the object subjective, but rather to render his own subjectivity as an object.

This is precisely one of the effects of the transformation of the human as I have described it via the transformation of the thing. We are becoming objects: we are becoming the ontological roommates of the natural world. It is not that we have never been natural before, but rather that we

have not previously been naturalized in the way in which widespread extraction of data is rendering us naturalized.

If I am correct in hypothesizing a fundamental transformation of the discourse of the human by way of a transformation of the discourse of the thing, then we are entering a wholly new set of historical *a priori* conditions: a new era. Resident within this new era are myriad or innumerable changes in what it means to be a human: even our old fables don't hold water. In becoming subject-object chimeras by way of co-constituting things—things which are themselves co-constitutions of greater networks of things, 'intelligent systems of systems'—we are entering a new morality, a new ethical set, and a fundamentally new relationship with the objects that populate what we have constructed as a natural world. We are becoming naturalized, and in so becoming, we are ceasing to become. Short of full on predictions, but more in the form of a forecast, what remains to be seen is the extent to which we, as a species (and as a subset of that species having access to all of these trappings of future imaginaries) will successfully survive this transformation. But I do not speak of survival to the exclusion of all but the maintenance of life. Rather, I speak of survival in terms of the individual, of the emotional, the psychological, and the metaphysical. The sense of belonging to the time in which one has to live the time of a life. I speak of the possibility of generational absurdity.

What remains now is to consider this question of the absurd—of the absurdity that arises from the attainment of subject-object status by way of ontological expansion—is to consider those effects that potentially cause absurdity within the context of the archive. Not solely in terms of the physical form that archival traces will take, but also (and perhaps more importantly) on the impact that these effects will have on the very structure and functionality of discourses within the greater arch of history: a history of our futures.

Part III

It is tempting to claim that an archive of IoT—an archive that is reflexively of and about IoT, but which must interface with the human archive—is something wholly new. This temptation arises from not only the personal desire to create new knowledge, or to, as in the case of some 15th century explorer, stumble upon *terra nova*. But this temptation has to be resisted, at least in part. In this, the final part of the dissertation, I will consider the ways in which an archive of IoT is both new and old, both *avant-garde* and deeply conservative. The archive is conservative in its avant-garde qualities, exercising its etiology alongside that of the human as she extends herself—as it extends itself—beyond the boundaries of its skin, beyond the realm of its sensations and perceptions, to include and accommodate parallel perceptual pathways simultaneously extensive and prosthetic. In this final section, I will consider the human archive as both inherently human and inherently technological: the human lives through things; the archive emerges from the interaction between subjects and objects, between the human and the image of things, between the human and the technical image of the human borne on the substrates of objects.

But first: what is meant by an 'archive of IoT?' In earlier sections, I described an archive of IoT as an archive that emerges from the data-extractive and analytic practices that are built into IoT-enabled objects. This remains true, but must be further contextualized: in the literature of archive theory (particularly in the works of Foucault and Derrida), there is a gap between archives and the archive—between the material instantiations of archival documents and the conceptual-historical realm of the archive. Both of these, when taken as complementary, add up to a gestalt: the human archive: an archive that is inextricably bound by the interactions of the human subject with the objects that surround it; an archive that emerges from the affordances that arise between the human animal and their environment; an archive that is as physical as it is conceptual. Several questions guide the composition of this final section.

Is an archive of IoT an archive in the Derridean sense as relates to Freud? An archive of some form of thought, some system of logic and ethnicity and identity that mingles by way of bodily inscription with the human *umwelt*? Yes, but not exactly.

Is an archive of IoT something closer to A Foucauldian archive, wherein statements are rendered possible through discursive transformation? Where mass discursive transformations give rise to new historical *a priori* conditions, new eras? Yes, but not exactly.

The archive of IoT is, instead of either of these things, both of them. It is a new archive in that it will present the human—its co-constituent, its subject and object—with a new historical *a priori*, an actor in new makeup, but still possessed of those buried or hidden qualities that, under the makeup, under the most apparent layer, constitute 'an actor.' It is new in that it is a topological transformation of the archive that birthed it; it is old because it is new, where discursive transformation and thus topological transformation is a fundamental process of the archive. It is old in its newness because the human archive, in being human, is as old as the species but as new as the latest extension, the latest prosthetic. It is perhaps newest in the sense that extensions of the human—their media formats—now give rise to prostheses: wholly new and external, parallel modes of sensation and perception. But it is also an archive of the identity of the actor that dons makeup, and archive that allows for identity—of the potential for the emergence of historical *a priori* conditions as a result of discursive transformation or reconstellation within the set of statements that makes up the archival set at any given time, during any periodized era. The archive of IoT is old because one might still make the statement, 'I am human;' it is new because this statement takes on new meanings in the context of IoT and the imaginary of future computing of which IoT is more broadly representative.

Statements rendered possible by and through the archive of IoT—going somewhat further than Foucault was willing or perhaps able to go—are not merely inscriptive in the form of governmental documents, or the documents one might consult in the positivist history of eras. Rather, these statements extend to the level of—and indeed are comprised of—the human body. Not the body as was described in Corinthians; not wholly the layer of skin that Gross (1999) used as a metaphor; and not the reliance upon external technologies to understand and map the functioning of the brain. Instead, these statements extend to the level of the human body because they are of the human body: the body, the vessel by which we are embodied—and therefore the vessel that comprises us and allows for a distinction between the world in here and the world out there, between subject and object—is the impetus for statements. The archive of IoT is the archive of the human body as much as it is the archive of disembodied prostheses because these prostheses—these means of collecting data about phenomena otherwise imperceptible or unimportant to the human—augment the human body: they cast it in a new light and create a data-driven reflection against which the body is compared as it acts across the scales of the home and the city and the individual.

In an originary act of genesis, embodiment and environment are co-constructed. The archive makes sense of this co-construction across time by adding to the environment descriptions. The human archive arises precisely because of human embodiment and the extent to which human embodiment begs the creation of media, extensions. But it is worth stressing here that by 'embodiment' I do not mean to imply a separation of mind and body, as in Cartesian dualism. Rather, in embodiment I allude to the holistic human, the dissolution of the ontological barrier that has, however explicitly or implicitly, separated the mind from the body since at least the time of Descartes. I speak of an embodiment where sensation and perception (only possible through embodiment) are leveled in status with cognition: where thought and sense, and sense and

perception exist in a mystical cycle of thought—to borrow a phrase from Flusser—as yet unordered by the imposed superiority of symbols and signs. This holistic body—the body as Gestalt—is not merely an interface, but a whole system that implies an interface: in being the body, possessed of certain senses, pathways, organs, systems, and mechanisms of internal communication, it constructs (or perhaps limits) the world in which it finds itself such that that world is relevant to its possible experiences: the human archive arises simultaneously with the jussive act of embodiment and maintains itself through the gathering of things both durable and descriptive; the human archive resides in the space between the subject and the object: it is an archive of affordances.

Because of this it will not be enough to rely solely on Foucault for a theoretical armature by which to build a theory of an IoT archive. Also because of this—for an archive that is maintained across generations and built upon through the production of knowledge inscribed upon extra-bodily substrates—it will be apparent that certain aspects of the Foucauldian archive are not best suited to support certain aspects of the archive of IoT.

It is in the embodiment of the human, and the changing nature of that embodiment relative to the emergence of IoT, that we find reason to consult Derrida's theory of the (Freudian) archive. Whereas Foucault's archaeological work dealt only in passing with materiality and never with the body—his was an objectivist archive where thought ranked superior to embodiment—the Derridean archive cannot be separated from the body: the body provides one of three initial impressions of the archive (Derrida, 1998). As will be made evident, there are reasons to pick from both theories of the archive when theorizing an archive of IoT—in so picking from both theories, the following treatment of the archive will demonstrate a new fundamental archival condition: a condition that supports, if not demands, multiple simultaneous and contradictory epistemologies;

an archive where matters of fact are not derived from matters of concern, but are rather assumed. As such, much of the remaining section of this dissertation will be devoted not exactly to reconciling the two theories, but to demonstrating the extent to which both are correct under certain epistemological conditions: that both are correct indicates a fundamentally new archival condition. In this condition, the subject—the human, embodied—exists according to the triple ontology of subject, object, and predicate, but does so both simultaneously and sequentially, where the simultaneity of this triple being dissolves across situations into the obfuscating reality of objectivity or subjectivity.[137]

Following a comparative analysis of both Foucauldian and Derridean theories of the archive—which, at times, will take on the appearance of an attempted reconciliation, however temporary—I will engage in several instances of speculative deduction. That is, I will treat the various findings previously presented in this dissertation as premises from which to deduce. But I've covered a lot of ground up to this point. As such, I now present a review of findings in preparation for speculative deductions.

[137] The human existing in a predicative mode needs no awareness: the predicative mode is a processual mode. There is much room to expand this emergent theory of the predicative human, but I reserve such development for a later time. Suffice to say that in the ensuing discussion of subjective and objective modes of being and their related archives, I am aware of this third mode.

Chapter Seven: Speculative Deductions on IoT and the Human Archive

7.1. An Introductory Conclusion (Premises from which to Speculatively Deduce)

The following nine premises are boiled down from the work that has preceded this section. It is from these nine points—the interpretation of them, the synthesis of them—that I will speculatively deduce potential archival conditions that will both impact and effect the transformation of the human.

(1) **The human is largely absent from definitions of IoT**. That is, the human is implicitly present in the imaginary of IoT, but it exists as an unmarked category. In being an unmarked category, one that is not explicitly addressed or operationalized beyond that of the highly reductive 'user,' the human risks great transformation at the hands (or perhaps the prosthetic sensors and actuators) of a pervasive IoT. Therefore, in order to theorize the archive of IoT, the human must be more clearly accounted for as an actant within the imaginary of IoT (both present and future). Given the absence of the human from extant treatments of IoT, I conclude that: the emergence of IoT heralds a fundamental change in the meaning of the statement, 'I am human,' where new meanings will emerge and colonize the semantic terrain of 'human,' precisely because the terrain remains poorly operationalized.

(2) **Explicit operationalizations or theorizations of the thing are also absent from the IoT literature**. This is cause for two thoughts: first, it is possible that IoT presumes a new form of thing; second, that the design and development of IoT-enabled devices could be better grounded in the rich philosophical traditions of ontology and epistemology; but also grounded in the equally rich and transdisciplinary realm of media theory. Still, there is little evidence to suggest that either of these is the case. The thing in IoT is presumed to emerge as new: its absence from the literature implies *terra nova*. The newness of these things, juxtaposed with the relationship between things and humans, becomes the central focus. To understand the transformation of the human, we must

also understand the transformation of the thing. In furtherance of the conclusion presented relative to premise (1): the emergent meanings of the statement, 'I am human,' will effect themselves in the space of 'things.' The human will become otherly human through and by means of the things they co-constitute in the act of gathering with objects. As such, we might speculate that emergent meanings of the statement, 'I am human,' will resemble the very meanings—the actionable affordances—that arise from and through this new category of things. The discourse of the human will begin to resemble more and more the uses of the thing.

(3) **Despite the absence of the human and the thing from scholarly coverage of IoT, through analysis of the literature from STS, media theory, design, and phenomenology, we find that interdisciplinary scholarly coverage of the thing fits well with IoT**. If IoT is operationalized as a 'system of systems,' then it is clearly defined as an additive or synthetic emergence. As such, IoT is in-line with the notion that the thing is always already a gathering. In its most conservative form, this is a gathering of a subject and an object. So, we are given reason to investigate the relationship between the presumed newness of IoT things and the structure of the gathering that gives rise to things. This newness, as demonstrated by Ashton (2009), can be (and often is) constructed not from the vantage of the human, but through the assumed primacy of the computer. From this I conclude that research in the humanities is (perhaps) more important that it has ever been: IoT cannot be known as anything other than technical without sufficient expertise being applied to the human question. It is simply not enough to focus on IoT as a technical matter or to tip the interdisciplinary cap of 'sociotechnical' in the direction of IoT research: rather, IoT must be interpreted according to the rules and methods of rigorous humanistic inquiry. To continue researching IoT in any other fashion is to concede the transformation of the

human in a way that removes human agency from the human's future. This conclusion is futher supported by premises four and five that follow.

(4) **Through the analysis of Neil Gross's prognostication (1999), however, we saw that the computer-centric view of IoT is not the only possible view. A computer-centric view renders possible its negative, its reciprocal: a human-centric view**. With regard to this human-centric view—and 'humanist' is too strong a word—we see that IoT can be (and should be) approached with seven thoughts in mind: the duration of elements in a time-based series that exceeds a human lifespan; the construction and maintenance of expectations of such time-based series; the ablative case as it relates to futures resident in the present; inscription and its role in constructing futures within the present; the material heterogeneity of inscriptive substrates through which the future is represented; the categories of internal and external and the possibility of a liminal space between them. In short, we see that human embodiment—its temporality, durability, and physiology—can function as a primary pivot point from which to analyze IoT. In addition to the finding presented in premise three: it is now imperative that we discover ways to think beyond the dichotomies and logics that have guided us to this point of humanistic dissolution. If, as I have argued, the objectivism latent in IoT is a descendent of The Enlightenment, and the ontological shift from subject to object is the apotheosis of the 'mature' human, then we must move beyond the too-comfortable dichotomies of human and posthuman, of prostheses and extension, of the subject and the object in order to ensure our own self-relevance. We have arrived at a catastrophic point in history, wherein our environment is failing us because we have (through the rampant exercise of objectivist de-naturalization) failed it. This logic—the human desire not only to categorize, but to act out such categorization through the objectification of phenomena and therefore the divorce of phenomena from experience for the sake of knowledge production—can no longer be understood

as valid in all situations. To think beyond the paths that have brought us to the brink of annihilation, we must reach all the deeper into the humanist toolkit—that which resides embodied as much as it does in text—in order to determine the concern of epistemologies: when and where objectivism is both worthwhile *and* sustainable. In order to do this, we must grow comfortable or unafraid of making mistakes—we must not fall prey to the professionalization of scholarship such that scholarship gives way to research, where research is measured in the least publishable unit and produced in a way that it is only topically questioned.

(5) **Because the rise of IoT can and should be analyzed from the point of view of human embodiment, we see that the emergence of IoT is always already an historical event: a human, and human-centric historical event.** But it is an historical event unfolding in the long present tense. So, any human-centric and therefore historical analysis of IoT must be achieved through a history of the present. To conduct such a history of the present, we need to move beyond the realm of scholarly communication and into the contemporary sociotechnical imaginary. Such a move is accomplished through distant reading and the analysis of marketing and promotional materials relevant to IoT. (It is worth noting that these five categories are not fixed. It is the nature of discourse to exist in systems. These systems are complex. As such, myriad vantages can be assumed in order to analyze them. Each vantage necessitates an assemblage of discourse: this is but one of those assemblages.)

(6) We accessed the contemporary, documental archive of IoT through LDA analysis of Twitter posts. **As a result of the LDA analysis, we determined that the discourses subtending IoT can be lumped into five categories**: the **thing** (i.e., the changing composition of the network of subjects and objects that comprise a thing); **objectivist and objectifying knowledge production** (i.e., data extraction by means of IoT-enabled devices that renders the subject (user)

an object from which to extract data); **scale** (i.e., IoT emerges at the scale of the city, the home, and the body); **media** (i.e., the objects that are IoT-enabled, as well as the objects that are used to communicate and represent the futures of IoT); and **the future** (i.e., the expectation of realizing an ubiquitous IoT). If we are to reassert human agency in the future of the human—the potential meanings of the statement, 'I am human'—then we are obliged to do so through the combinatorial analysis of these discourses. That is, we must systematically analyze the ways in which these discourses might interact with one another to give rise to or effect discursive transformation. Through the identification of these five discursive categories, we see that the rise of IoT is, in fact, a harbinger for a great transformation of the human.

(7) **Each of the scales at which IoT unfolds is characterized by objectification**. This objectification is effected through the extraction of data from a user (formerly a subject) by means of an object with which they form a thing, and the feedback of information derived from that data via the same object. The subject concretizes as a subject-object chimera: she displays ontological qualities of both subject and object.

(8) **The transformation of the human by means of IoT is occurring at an ontological level: the human, who is now a subject-object chimera, will not reside long in this interstitial space between ontological categories**. Either: a biune ontological structure will evolve into a triune structure (comprised of subjects, objects, and subject-object chimeras); or the human subject will be known as a subject only through objectivist lenses, thus rendering the subject as an object. In this latter case, the human will be known primarily as an object. As a speculative conclusion relative to this premise: we are living in a transitional archive, but a transitional archive that, by means of rampant and unquestioned objectivism, primes us to concede human agency in

determining human futures. Without the reassertion of our agency—its rediscovery through humanistic scholarship—we will become objects.

(9) **We are, at the moment of writing, in the middle of this transformation**. We are caught up in the feedback loop of reconciling the world of experience with the objectivist, reductionist representation of that world that emerges from data-extractive, prescriptive analysis. If we are to design IoT in such a way as to imbue it with the values we have held dear since The Enlightenment, we are obligated to engage in a process of speculative deduction: to take the premises described above as givens and to deduce from those givens potential outcomes relative to the meaning of 'being human.'

7.1.1 An Archive, Both New and Old

If the thing in IoT is new, so is the human. The human is inextricably bound up in the thing; the thing in the human: we are creatures of action, of interaction with the objects that constitute our environment (itself constituted by boundaries of our bodies). The *umwelt* (Von Uexküll, 2009), the *lebenswelt* (Husserl, 1970), the *habitus* (Bourdieu, 1977) by and *habitèle* (Boullier, 2014): these are the locations, overlapping although grounded in different scholarly traditions, in which emerge *affordances* (J. J. Gibson, 1977)—the actionable potentials that arise between subject and object to construct a thing across the increasingly porous membrane that separates subjects and objects. Subjects and objects meet in interactive feedback to produce the human at the same time they meet to produce the thing.[138]

[138] I reassert the value of exploring the relationship between these terms rather than relying on staid, disciplinary stances that wuld suggest their incommensurability.

The archive of IoT is a new archive, born of an old one. It is an archive that is old by means of its newness, where the generation of new *a priori* conditions is a primary autopoietic function of the human archive.[139] It is an archive that is violent unto itself so as to protect itself—that transforms itself, or allows for its own transformation, so as to maintain continuity, so that even those radical historical breaks that characterize the ends and beginnings of new eras can be said to be derived of a specific archival set (bound by the same experiential membrane that delimits the ends of our natural bodies) and no other. It is a path dependent archive, but not in a linear sense: path dependent in a complex sense wherein the discursive elements that comprise the archival set can be constellated in mathematically limited, but functionally limitless numbers of ways, each constellation of which may give rise to emergent properties, not the least of which are new media formats, new inscriptive substrates.

In that IoT, as we have seen in the second part of this dissertation, is first and foremost predicated on connectivity and the data-extracting value of such connectivity—a connectivity that extends between ***i*** possible configurations of subjects and objects, but always stemming from a gathering of some number of subjects and objects—and the state of connectivity always already occurs in a present tense, we begin to see in the archive of IoT an archive of the present tense: a presently accessible archive. Such accessibility arises from a discursive transformation that was

[139] The term autopoiesis comes from the work of Varela, Maturana, and Uribe (1974). In this work, the authors describe autopoietic organization as follows: a unity by which a network of productions of components which (i) participate recursively in the same network of production of components which produced these components, and (ii) realize the network of productions as a unity in the space in which the components exist' (p. 188). Given that I have developed an operationalization of the archive that is inseparable from the embodied human, I believe there is a great deal of value in exploring the autopoietic organization of the archive: although it is a stretch to call the human archive a living entity, it is no stretch to assume that, in being inextricably linked with the human, it demonstrates autopoietic characteristics also demonstrated by the human.

latent in the archival set, but one that was not accessible to earlier archival theorists, such as Foucault for reasons of technology and materiality.

For Foucault, the archive was predicated on the archival methodology of archaeology (Foucault, 1982). That is, a method that was first and foremost concerned with dust—with the symbol of time and the durability of documents made accessible only through their accumulation at a paper speed, at the speed of the state and statistics written and compiled on certain forms of media. The Foucauldian archive—and by this I mean not the theoretical archive, but the archives to which the historian or historiographer has access—did not exist in real-time, or anything approaching a present tense. Rather—and this is the center of Foucault's concept of heterotopia—the present tense of the archive emerged for Foucault as a memorial, a monument of records representative of a distant or removed epoch, one in which daily lives can, indeed, be studied, but only from temporal remove. This is an archives of multiple temporalities that collapse at the point of the analyst, the archaeologist, in the present tense.

For Foucault, the archive that underlies an archives of paper (i.e., the archive that is beyond and beneath the archives and yet somehow emerges above it through the analysis of its documental contents) is only ever accessible by means of an autopsy: the temporalities and rhythms of daily life present as objects of archival study only after the daily life they represent has been removed from them. This is (emphatically) not the case in the archive of IoT. In this difference between the Foucauldian archive (both in terms of the archive that manifested in the historical *a priori* into which Foucault was born, but also in terms of the theory of the archive presented by Foucault always already bounded by that particular historical *a priori*) and the archive of IoT, one sees a close relationship with the Derridean archive of *Archive Fever* (Derrida, 1998).

Although Derrida devoted only one or two short lines to the contemplation of email's effect on the nature of the Freudian archive, he began the initial paving of a new in-road to the understanding of the archive: the form of the archive not only fits its function, but defines it. Moreover, the function and therefore the form of the archive extends from the condition of human embodiment. The speed with which email can be written, read, responded to, documented, and stored is greater than of the written word on the page or the insertion of numerical signifiers on forms. What was lacking, however, at the time at which Derrida wrote *Archive Fever* was a widespread and widely usable infrastructure for the analysis of such stored documents. We have now, unlike in the late 1990s, (and largely because of the spread of statistical methods and tools within the Digital Humanities) just such a widespread and widely usable epistemic infrastructure: distant reading. The archive of digital inscriptions becomes readable in near-real-time—in the long present tense—via the implementation of such tools as LDA or semantic analysis.

So, the emergent historical *a priori*—the future into which we are even now sliding—yields an archive that is topically accessible in the present tense. This does not mean, however, that the depths of the archive, that those latent or obfuscated elements contained within the set are immediately or directly accessible. The human archive is directly accessible precisely because it is human: it arises from the condition of human embodiment, the production of (materialized and durable) knowledge, and the human drive to classify. But just as it arises from embodiment, it recedes, in part, because of embodiment: each of us, possessing only one body, has only access to a small portion of the greater archive. We live within certain infrastrcutures, certain cultural histories, certain experiences and memories. While these certainly comprise one facet of the human archive—and it is possible to imagine a human archive with as many individual facets as living people, and indeed, people who were once alive—they blind the user through the anamnesis of

living through and by means of things to the discursive undercurrents of the greater human archive. What is required in order to access these undercurrents are acts of interpretation: translational distanciation, multi-modal critical discourse analysis, and intuition guiding an abductive approach to analysis. Where data is collected—and therefore where a world is created as objective through such data—the human act of interpretation is essential for ensuring the survival of the human, not merely as an animal within an environment, but as a complex set of discourses that, when synthesized, render 'the human' as we have come to know them since at least The Enlightenment.

The archive of IoT presents as one possible topological transformation of the greater human archive. But the archive of IoT is not limited to, nor even mostly comprised of, textual data, as in, say, the archives in which Foucault spent the majority of his archaeological career. It is, instead, an archive of machine-readable data: of reductive, quantitative representations of action in the world communicated between ***i*** possible configurations of subjects and objects: things. What's more, it is an archive of the modes by which machine-readable data bleed into the phenomenological world of the human; an archive of interactions and the possibility of interactions between emergent phenomenological conditions. It is both a documental archive and an archive that defines the possibility of new forms of documents, new forms of text.

What this paradoxical development yields is an archive that is fundamentally bifurcated. The archive of the human world becomes readable, analyzable in the long present tense; the archive of the IoT world, a parallel computer-centric phenomenal realm, that is contained and birthed through human design an intervention, but cannot at a basic level be accessed by human subjects, becomes as purely inaccessible in real-time as the archives with which Foucault and Derrida worked. What stands in as a set of proxy phenomena representative of this phenomenologically alien archive is the imaginary that births it. This imaginary (or these imaginaries) return the observed, the subject-

historian, back into the realm of the newly accessible human archive and necessitates that use of abductive inference: given the observations ***a*** and ***c***, what relation ***b*** could explain their existence?

7.1.2 The Archive: Stuck in the Middle with You

We are in the archive, I have said. We are in the human archive, I have also said. We are bound by the archive because the archive fits, like water in a cup, to the form presented by the human body and the environment it creates: it boths fits and is fitted to human embodiment. But the archive is not purely within us; nor is it purely without. In contains us, reaching through porous skins of ontology and embodiment to become part of us like air in lungs that does not precisely belong to the body that temporarily contains it. The human archive is one of interaction, of the space between the subject and the object that contains, however briefly, potential actions bounded by mutually co-defined affordances. As we flirt with an age—the age of potential memory (Bowker, 2005)—in which we become objects constructed through data, we must more closely analyze the extent to which we can be either exclusively in or outside of the archive—more precisely, we must begin to examine the validity of such dichotomies as external and internal through the lens of spectrality. If, as I argue, our ontological emergences of the human as subject-object chimera results in a bifurcation of the archive—a splitting of the archive into a subjective mode and an objective mode—then we must consider then possibility of two simultaneous archives existing (in addition to whether or not we are ever truly present or absent from one or the other or both). To do so, in part of this chapter I will focus intensely on the Derridean notions of archival violence (the jussive and the sequential) and on spectrality.

We are as containers in time through which part of the archive passes—the experiential part that gives rise to and begs the creation of documentation—like a string through the pearls of a

necklace; in allowing the archive to pass through us, we as pearls co-constitute the necklace: we embody it. We become more than ourselves (and less) when we are consciously engaged in the maintenance and construction of the archive (i.e., through the reductionist production of documentation and through the generative analysis of documents). We assimilate new topological transformations of archive, and they assimilate us. In this way, one might think of the archive not as a set of all possible statements or events, but as the set of all possible *things*: all possible subject-object couplings (or ***n***-adic, network-like constellations) that give rise to actions/events in the world. We are bound by the concepts of the archive—things as signs—and by the physicality of the archive—the affordances that arise between subject and object, where objects carry signs that extend beyond the linguistic into the actionable.

But things are varied, I have said. Indeed, the traditional gathering of the thing is no longer traditional, but expanding. (It expands in the tradition of a violent archive, but in being the object of expansion becomes something other than itself: an evolution, a mutation, a continuation by way of breakage.) In the future of IoT, and therefore the impacts of IoT on the structure and function of the human archive, multiple subjects gather with an object to produce a thing; multiple objects gather with a subject to produce another. All that is left that binds the concept of the thing is the notion of gathering itself. But then, how can a thing exist in light of a bifurcation such that which may characterize the archival topology of our next historical *a priori*? How does a thing exist or change in existence in relation to the built-in relativism of multiple subjects constellating aroud a single object? Either there must be a space between these two archives—the archive of the objective and the archive of the subjective, as in the case of a perpetual, tension-based subject-object chimera—or there must be a singular resolution: one archive must win over and thus erase the other.

In Part II of this dissertation, I investigated the point at which the string passes through the pearl: the material manifestations, the inscriptions—videos, diagrams, emails, texts—that orient us within the archive and towards futures and pasts. I described these futures in terms of the technical image. I argued that we, humans at the end of our primary subjectivity—at the possible conclusion of The Enlightenment that allowed us to first realize ourselves as objectified subjectivities—at the apotheosis of objectivist naturalism as scientific religion, gain access to the living archive—not a stable archive, but an archive in motion—through inscriptions: that we are in and of the archive both external to it and within it. In being in and of the archive, we become, ourselves, archival even as we walk down sidewalks, shop, drink a Coca-Cola, run, and dream. We embody the archive because we are embodied. We become our own Others through our inclusion in the archive that is not wholly within any one of us when we evolve this archive through the generation of new modes of objects, new gatherings of things.

I turn now to adopt a different vantage so as to explore the state of the human archive, a state that will transform along with the archive itself. But this vantage is, really, two simultaneous vantages. It is a hall of mirrors where, on one side, one sees the archive of the objective: an archive of representations born of IoT-enabled, data-based extractions—a logical and final conclusion to the objectifying (de)naturalization of the world through data-driven empiricism wherein we are finally, once and for all, defined as objects of our epistemic modes. On the other side, one sees the archive of the subject: an archive of the experience of being archival, the experience of living a life at the temporality of the mundane where actions are but possible mines from which to extract the ore of data. We look at the human now not from within, but from without: we look not to the archive through a set of human eyes, but to the human eye from the wormholes of stacks and binding, of melted acetate, invisible wi-fi and Zigbee signals, the eye of a history as yet unwritten

by the violence of the archive. We look to the very nature of archival violence itself: a violence that enacts itself so as to maintain itself.

In doing so, I will propose—through processes of speculative deduction—a transformation of the archive that heralds a new historical *a priori* condition. In this condition, the archive remains manifold—it presents in the form of each embodied human, but lurks in its totality beneath and beyond in a Gestalt form. But it is also bifurcates. (This bifurcation, visible in the present tense through the ontological tension between subject and object, is likely only a symptom of a greater transition, wherein the archive will reunify.) One archival set that subtends the experience of being human becomes two, each of which is a mirror of the other: and we are stuck in the middle, stuck between the subjective and the objective even as we act in the predicative mode to produce things, however temporarily. In the mirroring effect that is created, the subject is seen as object; the object as subject. Two identical archives, by virtue of their reflectivity, create a state of relativity. They create an archival set that is other than itself by being itself, capable of being seen from another vantage. But, like neurotransmitters temporarily residing in a synapse, we are to be absorbed by one or reabsorbed by the other. We will not remain in the liminal space.

Grounded in the embodied form and function of the human, we might think of this bifurcation as the result of an archival mitosis and cytokinesis: the archive as it was, the archive of the historical *a priori* from which we are now propelled, duplicates itself and splits creating two identical archives. These archives, I propose, interact at an ontological level to produce archives that correspond to the formerly discrete ontological states of the subject and the object. (I will discuss these two archives in terms of Bertrand Russell's dichotomy of knowledge by description and knowledge by acquaintance [Russell, 1905, 1951a, 1951b], where description represents an objective archive and acquaintance represents a subjective archive.) These processes of mitosis

and cytokinesis leave us with a divided human archive: an archive of the subject and an archive of the object, one facing and reflecting the other; the human, always already alive within the archive, moves between them as chimera. The bifurcation of this archive creates us anew as chimeras, but transitory chimeras: a living stage of archival evolution photographed as we extend ourselves through prosthetic, sensory, data-extractive objects, wherein we will shed certain vestiges to become either one (anew) or the other (again).

It is here that I theorize the temporality, the durability of the chimerical state of the objective-subject. The objective-subject—the subject-turned-object through willing enrollment in a system of objects that act to extract data from a subject and redefine it through the analysis and re—presentation of this data—is a transitory state. It is a precursor to—what?

To recursive transformation. The human and the archive walk hand in hand, each ready to the hand of the other. Our current transitional state is a precursor to the epoch-defining topological transformations the superset of the archive will undergo as it shifts from this age to the next, and from the next to the subsequent. As I have argued, we exercise our humanity through and by means of things; so long as this is the case, the archive (and its discourses) will transform alongside our designed extensions. In being such a precursor, it is also an antecedent to those archival transformations that have occurred before: the shift from the agricultural age to the industrial; from the industrial to the digital.

7.1.3 Drinking the Kool-Aid (A Toast)

Archives are intoxicating. We are drunk all the time if wine can be said to drink itself, to embody and enact its own effects. It is tempting, in such a state of intoxication, to predict. (It is also tempting to forget—we could just as easily avoid consideration of this transformation and

march blindly, albeit on wobbly feet, into the night to lean on lampposts and IoT hubs.) But prediction is a fool's errand in terms of the scale of this argument.

What is left to accomplish in the absence of prediction is to forecast, and in forecasting to theorize. By theorizing the discourses active in the transformation of the human—and therefore the discursive transformation that will render a new historical *a priori*, a new jussive violence—I will explicitly not predict the emergence of particular new technologies or specific redistributions of power. I will, however, provide an armature that will allow us to consider what forms the archive might take—temporary bifurcation, permanent bifurcation, an Other-effacing reunification?—what kinds of archival mechanisms may arise, when the interplay of the archive of acquaintance (the subjective archive) and the archive of description (the objective archive) reside alongside each other and increasingly vie to be forgotten, to be made invisible, and being made invisible, become the stuff of infrastructure for a new historical *a priori*.

In providing an armature of this sort, I will also create a vantage from which to consider the effects that this second great bifurcation (whether temporary or permanent) will have on the phenomenological experience of being human in the temporality of the day-to-day. In this way, we might say that this is a correlationist view of the archive, but correlationist only in its juxtaposition with the object-oriented ontology (OOO) (Harman, 2018) of the archive of description, of extractive objectivism.

These two temporary archives—the subjective and the objective—must exist side by side not as means of critiquing the other, but as simultaneous matters of concern. It will be the role of the human once this bifurcation is complete, once the cell of the former historical a priori has divided, to navigate the liminal space between them: the space where we now live bound by our lifespans, when one era gives way to the next.

7.2 Approaching the Archive

> Nothing is less reliable, nothing is less clear today than the word "archive." […] Nothing is more troubled and more troubling.
>
> (Derrida, 1998, p. 90)

There are at least two ways to read Derrida's statement above. First, in terms of materiality; second, in terms of theory. With regard to materiality, he is speaking of the proliferation of different media formats used to store information in an archival way. As such, and at first glance, this reading pertains primarily to the notion of brick-and-mortar archives—the evolution of dusty rooms to underwater servers cooled by currents. The second reading is more closely related to the tradition of the archive-as-theoretical-construct: the same archive described by Foucault.

Both of these readings are interesting and relevant, but they become all the more interesting when they are juxtaposed and compared. For Foucault (1982), as we will see (and whose theory of the archive predates Derrida's elaborated theory of a Freudian archive, as presented in *Archive Fever*), archives and the archive do not meet. But, true to form, Derrida potentiates a re-gathering of these two forms of archive: always the pinnacle of a reader, Derrida implicitly questions the exclusivity of archives and the archive. But more than that, he questions the mechanisms of the archive and how they act upon and through the documental holdings contained in archives. As a point of entry into a much broader (although somewhat truncated) discussion of archives, I present overviews of both forms.

As sites of practice, archives are pell-mell and they are painstaking. They are old and they are new, visited or inhabited, as official or unofficial as their ordering archons and the worldly

phenomena their records represent and create. They are tactile and present, paper and dust to be pored over through touch; and they are visual and distanced, instantiated through the mediation of a computer screen or glass cabinets. They are of the past and project a set of possible statements that will guide the future—not only a future of actions, but a future of thoughts and modes of thinking. In this bounded set of hypothetical tenses, archives are complex in a gestalt sense, yielding through their simultaneous heterogeneity the conceptual space of *the archive*. This is the initial, folded impression of the archive.

Simultaneously comprised of and comprising the sociotechnical assemblages that bear their contents, however visible or invisible such technologies or assemblages may be (Weiser, 1991), the structured relationship between archivally derived history and the phenomenal world is as a landmass in murky water: partially obfuscated, partially submerged. It is a phenomenological connection, but only appears through the refractive lens of the media we create. On the one hand, archives are clearly visible as sites of practice, as repositories for documents comprising prosthetic institutional memory. On the other hand, the relationship between archival documents and the phenomenal world is less apparent—the conceptual bond connecting archive and world lies below the surface. The visibility of the former misdirects from the latter; the relationship between the phenomenal world from which objects are culled and the narratives that archival research might yield is theoretical at best.

But whether instantiated through transparent or opaque technologies, archives remain archives, both visible and invisible—there is a whatness there, a placeness (Tuan, 1977) dictated by functionality and the pervasive necessity of prosthetic memory. (Prosthetic memory aids cultural memory, and as Cesar Hidalgo has noted, we are nothing without cultural memory [Hidalgo, 2018].) The documental artifacts contained therein and the potential narrative line(s)

these artifacts may form upon their re-combination define the archive's conceptual placeness as site of potential statements and therefore potential futures. We know archives when we see them because *the archive* always already is. It as ubiquitous as the human drive to classify (Bowker & Star, 2000), to remember, and know the world in a standardized way.

Two closely related facets of archives were implied above, which will now receive more attention: first, the archive as site of practice; second, the archive as theoretical construct, representing the laboratory of historiography, intellectual history, and media and cultural studies. In the practical sense, archives are places of prosthetic memory. Disembodied, but nonetheless material, memories inscribed in material fragments waiting to be remembered through future processes of reassembling. To archive in the practical sense is to engage first with concept of prosthetic memory and its implicit necessity in light of the compound rhythms of individuals and institutions (Jackson et al., 2011), and second with the (proto-)knowledge artifacts materially implicated therein—to appraise, exclude, preserve, and collect in hopes of facilitating the future (re)construction of narratives. (One does not read an archive in its entirety, but rather creates narratives from within the set of potential narratives made possible through an archival collection [Farge et al., 2013]). The memory of *the archive*, as the gestalt-like discursive aggregate of archives as sites of practice, is the boundary between the phenomenal world and the attempt to derive objectivist knowledge from it.

In this light, colored by physical interactions with inscribed substrates, the archive as site of practice appears most active in the past, the imaginaries of which presume a set of potential institutional futures. It is in the selective representation and construction of a past begging the occurrence of future consultations, reconstructions, and reinterpretations where the second commonly held vision of the archive, *the archive* as theoretical construct, that of Foucault (1982)

and Derrida (1998), resides. This residence is the discursive bi-directional line of sight attaching the past and future, simultaneously exerting influence over the knowledge-productive boundaries of each; it is the mechanism by which the would-be ephemera of the past is potentially connected across tenses and rendered accessible for the production of knowledge, or narratives derived from the analysis of text(s). But a conceptualization of *the archive* and specific archives as wholly separate is misleading, if helpful for explication. (Although, as we will see, Foucault explicitly differentiated the two—but this was possibly a rhetorical move.)

I maintain that archives as sites of practice and *the archive* as theoretical construct are co-constitutive, as in the case of a bi-directional feedback loop. From the practice of such archival acts as preservation and appraisal, materially embodied repositories of statements are created, and through their creation the discursive boundaries of the particular historical era in which those statements arose are reified. If this seems convoluted, that's because it is. The creation of a dichotomous relationship between archives and the archive (as in the early work of Foucault) forces such unwieldy statements: it is easier (and more productive) to see the archive and archives as two sides of the same coin, rather than oppositional categories.

I am not the only one who feels this way. Rebecca Lemov (Lemov, 2016), for example, discusses a mid-twentieth century attempt to collect and capture 'all sociological data in a single clearinghouse' (p.33). While she does not explicitly illustrate the relationship between the archive and archive, it is implicit and inferable from her writing.

This potential database ("Microcard Publications of Primary Records in Culture and Personality," v. 1. LaSalle, WI: Microcard, as cited in Lemov, 2016), which was never realized, would have constituted a 'total archive […] containing all ephemeral data from the domain of subjectivity collected from peoples around the world" (p.30). It is plain to see the potential value

of such a database: to have and to hold a comprehensive, documental record of the experience of being human: it is to know the nature of the human, to construct that nature from holdings. The relationship between the archive and archives becomes particularly clear in this example. All intentions aside, the curators of this would-be archive envisioned a translation of experience into description: dreams, thoughts, actions—all extant only to the extent they were experienced by the subject responsible for them—were to be inscribed upon a documental substrate and included in this archive of dreams (as Lemon refers to it). But the simple fact is that there is no avoiding documental reductionism: to document something is to create a representation of it; to create a representation is to create something different, a mirrored image that distorts, however subtly, that which it reflects. In the act of reflection—both thinking and showing—the phenomenal world, the actions and thoughts, dreams and beliefs of the subjectivities represented in this archive, become something other than themselves. They become reductionist representations of themselves. Now, assuming that there was an intended use for these archival holdings—and based on the fact that the team responsible for the potential creation of this archive was a team of psychologists (Lemov, 2016), we can assume that there lurked the specter of generalizability in the documents' use—it is no stretch of the imagination to see problems of validity arise: the human experience that is constructed via the analysis and narrativizing of documental holdings within this archive of dreams cannot—categorically cannot—but approximate the subjective experience of those responsible for the generation of data: the data does not match the experience.

Therefore, in the attempt to compile a total archive—this archive of dreams—the authors demonstrate a fundamental misunderstanding of the directionality of archives, and therefore the functional relationship between the archive and archives. First, the directionality. This is similar to the question of the chicken or the egg. But, in a pragmatic and functionalist light, we need not

consider the priority of the archive or archives. We need only understand that they now exist simultaneously. Given their simultaneity, we must only determine the directionality of influence. As you might expect, this directionality is bi-directional: we might say that experience feeds the archive by way of data extraction, accession, curation; we might also say that preservation and analysis feeds the experiential. The point at which the archival holdings are analyzed for the purpose of creating (generalizable) knowledge about the populations from which they were derived (extracted) the world is forever changed. It is no longer a world of the purely phenomenological, the purely experiential: it is a world of objectivism and the experience of objectivist interpretations. It is in the feedback loop between the subject from whom data is extracted (and thus, the subject turned objective-subject) and the objective proto-information, the extracted data reassembled into findings, that is held in archives that the space of the archive emerges: it emerges from the media, the semantic content, the modes of interaction, and the epistemological and ontological infrastructures that guide the knowledge-productive social imaginary.

To return to the language used in Part II of this dissertation, the data that is collected, documented, accessioned, and preserved within archives, constitutes or constructs a technical image: the human, if the human be the object from which data is extracted, seems herself through the technical lens of the archive in which she is represented. Now, given the temporality of being a human—ever stuck in a seemingly forward-moving stream—the relationship between the human that experiences and the representation of the human that is to be experienced (derived from archival holdings and the interpretation thereof), one sees a sort of Sisyphean race: the subject views the objectified version of herself and acts to demonstrate its characteristics. We become that which we are not—objectivist reductions of ourselves—by means of the archives that hold

representations of us. It is in the process of acting in relation to these holdings that the archive emerges: it emerges in the form of appropriate actions, of possible statements, of interpretations and worldviews. It is therefore in this liminal space between experience and representation—the former being standardized by biology; the latter standardized by the confluence of society, institutions, technology, epistemology, and ontology—that discursive transformation must be located.

If this deduction stands true, then what remains is to be achieved is the identification of the mechanisms of discursive transformation. (Or at least a subset of those mechanisms.) To this end, I now present an overview of Foucauldian archival theory. This primordial theory will then receive greater context through the lens of Jacques Derrida. Once reconciled, the emergent theorization of the archive will be situated within Geoffrey Bowker's (2005) concept of the Age of Potential Memory. Following that discussion, this dissertation will conclude with observations and abductions about the future of the archive: that we are in a state of archival transformation presently, stuck between two mirrored images that distort and bend the light of experience in different fashions. We will, I argue, ultimately enfold ourselves into one of them rather than the other. Thusly, the Age of Potential Memory will be fully realized, not only in terms of a ubiquitous *post hoc* vantage upon knowledge production, but in terms of a pervasive objectivity: an objectification of the human subject once and for all.

7.2.1 Impressions of an archive of IoT

As I demonstrated in Chapter Two, IoT is often—perhaps most frequently—framed in the near future. It is discussed of in terms of 'by 2020,' 'by 2025,' or 'by 2035.' So the social imaginary of IoT, we might say, is one that exists in the present tense, but by virtue of being about IoT is directed

towards the near future: it is a social imaginary that pertains to the development of a proximal future. We might then also say that the Internet of Things always already occurs in a future tense, or perhaps an adjacent present (Kauffman, 2003).

In its envisioned ubiquity, IoT is always *then* or *there*, but never *here* and *now*. In its entirety—that is, in any form other than the singular, the anecdotal—it is an imaginary, or set of possible futures more or less indistinguishable from fictions but for an underlying sense of attainability. Moreover, this sense of attainability stems from the contemporary imaginary: the modus operandi for making sense of the world, expectations of worldly functionality, and one's actions within that world. Through this imaginary, engineers and consumers envision and construct, with varying degrees of intentionality and agency, the possibilities of future social, governmental, legal, and personal structures that will necessarily spiral off of future objects—objects do not exist in a social or cultural vacuum.[140] They envision the could-bes and the mights, the maybes and the what-ifs. As an imaginary that is at once purely conceptual (as in the imagination) and also deeply rooted in the physical objects comprising the phenomenological environment of the human archive, IoT is as a moveable lens: each potentially network-connected and data-communicative object bears potential traces of a future in which that object is both more and less than itself as it exists in its current state. It is potentially more than itself because of the process of augmentation that underlies the addition of a data-collecting sensor; it is potentially less than itself because such an augmentation changes implies the reductionist tendencies of data-driven empiricism, or the process of producing capta and therefore exercising a creative destruction of the phenomenal world. In so changing its worldly value, this augmentative reduction or transformation must impact

[140] I use the term 'objecs' in its purely grammatical sense. That is, I do not refer exclusively to the type of objects so frequently confused with the term 'things.' In the context of this statement, much of the work comprising this project is philosophically in line with the agential realism of Karen Barad. However, as I will discuss subsequently in this section, linguistic differences prevent me from fully subscribing to that viewpoint.

the phenomenological experience of the object—the way the world presents through interaction with the object in the production of things.

The imaginary of IoT is a future of unabashed connectivity and algorithmic processing; it is a future where objects speak for themselves alongside, with, and in place of biologically communicative actants. What then would it mean to consider the existence of an archive of IoT? For whom would data be inscribed and stored across time? Would this be an archive accessible only to the objects that gather data? Accessible to the subjects who will surely continue to live in a deeply sociotechnical world defined, in part, by IoT-extracted data? Both?

To envision an archive of IoT, it is necessary to return to the 'paucity of the subject-object dichotomy' as described by Gibson (1977). This is necessary in the context of IoT because of the extent to which the nature of objects is changing—not solely in terms of their relationships to subjects/users, but in the forms of inscription they allow. If the form of an object dictates the form of inscription(s) it might bear, then the form of the inscription(s) dictates the ways in which a subject can interact with given inscriptions. Material inscriptions, in both their semantic content and the semantic content of their form, comprise the topical, interactive layer—the interface—of the human archive. The interactions one might have with a given form of inscription impacts how the semantic content of that inscription—text, image, binary data—can be parsed not only in a strictly logical-empirical sense, but also a broader phenomenological sense. Inscriptions are, after all, objects that populate the world in which we live. (It is, indeed, a complex and subtle web that is woven between object and present tense knowledge of the world.) In due course, following careful explication of the subject-object dichotomy as it occurs in HCI and IoT in relation to the discourses identified through close and distant readings of various IoT texts, I will address the paucity of the subject-object dichotomy in terms of the archive by way of Foucault, for whom the

archive is the limited set of possible statements derived from statements contained on/in archival artifacts; and Derrida, for whom the archive is a site of violence wherein '*L'un se garde de l'autre pour se faire le violence*.' Each of the following interpretations and critiques of Foucauldian and Derridean notions of the archive will be informed by the phenomenology of the archive presented by Arlette Farge (et al., 2013) in her monograph, 'Allure of the Archives,' and more specifically in terms of the theory of the human archive—its construction through the production of things that arise through the meeting of subjects and objects—that I have been developing here.

In theorizing an archive of IoT—an archive of imaginaries and data, of the imagined uses of data and their reverberations—it will become apparent that such an archive is not strictly an archive at all. At least, not in any sense with which I am already familiar. Nor can such an archive be considered an anarchive, or simply an archive-in-motion. Instead, and along the lines of the argument presented by Derrida in *Archive Fever*, an archive of IoT becomes an archive of the desire to archive—an archival drive that is ultimately irreducible to an archive itself, unless one is willing to allow for the existence of multiple simultaneous, contradictory, and incommensurable statements arising from the same archive. (This becomes particularly difficult to do given the extent to which IoT is driven by the underlying promise of Big Data—an objectively pure understanding of even the most minute and immense aspects of the world, both natural and social (whatever those are) by way of quantification.)

An archive of IoT must be an archive that is multiply accessible across wide gaps in phenomenological experience: accessible on the one hand to the living, to the human; accessible on the other to the unliving, the prosthetic sensorial such as that which was envisioned in Kevin Ashton's 2009 article (discussed in Chapter Two). This would, indeed, require a fundamental reconfiguration of the relationship between subjects and objects, between the mind and the body

(in terms of Cartesian dualism). I am not willing at this point in time to argue that such a reconfiguration is possible or even practical—the weight of language, of history, and of the very ontology that has given rise to IoT, is against such a reconfiguration. What is left, then, in terms of an archive of IoT is simply the desire to know the world, and the effects that such a technologized and fetishized desire have on the fleeting subject-object couplings that comprise the world. The drive to archive becomes the archive itself, its Sisyphean exhaustion, its ouroboric hunger played out in the differences between the *durée moyenne* and the *longue durée*, between the rhtyhms of the individual and the institution, between the animal and the species.

7.3 Foucault's Archive

The archive, for Foucault, is a not only a field site that begets a methodology (archaeology) but a system of concepts that explains—perhaps analyzes is a better term, for Foucauldian thought is more often critical-structuralist than explanatory—how particular modes of knowledge, modes of thinking, are fostered, concretized, and ultimately transformed with the emergence of new possible statements. For him, the interplay of archives—that is, the physical instantiation of the archive in the form of documents, records, etc.—and the archive is often an aesthetic experience, a bodily experience. Given the breadth of this theory, it is applicable to almost any scenario wherein knowledge is produced. As some would argue—myself included—to live as a human is to produce knowledge, be it formal or informal, and so the theory of the archive is applicable to every aspect of human life.

In light of such widespread coverage, this section is only intended to provide a cursory outline of the Foucault's archive. While I find Foucault's theory of the archive to be fascinating, even provocative (and in being provocative, generative and productive), I am not a standard bearer. In

fact, there are certain aspects of Foucault's theory of the archive that infuriate me. One such aspect served, several years ago, as the impetus for the longish journey that has resulted in the work you are now reading: in his 'Archaeology of Knowledge,' Foucault posits that discursive transformation is the central mechanism of the archive, the mechanism by which the archive changes itself and one era turns into the next. (It is thusly the mechanism that accounts for the breakages between one era and the next that were so dear to the theorist's work.) But nowhere does Foucault identify the mechanisms of discursive change. One might as well say that they drop from the sky or reside solely in the analyst's intelligent ability to decipher them.

Moreover, Foucault's archaeology can only be applied *post hoc*. This is a shortcoming of his theory, but a shortcoming that has its roots in Ranke and the rise of empirical history, a history that is predicated on documentation and records, which, until the rise of digital technologies and their posthumous proliferation, necessitated the consultation of paper goods in dusty rooms. Because of the media formats that constituted their holdings, the inscriptive substrates by which statements are carried, the archive, for Foucault, was always already a thing of the past (both literally and figuratively).

It is possible, given Foucault's focus on historical archives, that he could not be expected to approach the identification of the mechanisms of discursive change. He dealt in documents that were fully entrenched in a given paper-centric historical *a priori*, one that perhaps stretched farther than he could see. He was emphatically not trained as a media theorist. In fact, recollecting my reading of *Archaeology of Knowledge*, nowhere does Foucault approach the materiality of his documents. For him, the archive is bounded wholly by the genus of paper goods such that there was no need to account for the impact of other media formats on discursive transformation.

Each of these intermingled issues (the absence of media-critical analyses, the orientation towards the past, and the theory's inability to identify and account for the actual mechanisms of discursive transformation) adds up to one great necessity: to update and amend this theory of the archive, this process of archaeology such that it is capable of addressing the history of the long present tense—a history that unfolds at the speed of experience and documentation.

Through the lens of the long present tense, it becomes theoretically possible and historiographically valid to posit the existence of the archive in the present tense. What was needed to access this present tense of the archive was a suitable methodology. To that end, I proposed the use of distant reading. As argued in Chapter Four, the method of distant reading does, indeed, grant access to the discursive structure of the current archive, or at least the discursive structure of one facet of the current archive. So, then, we have already accomplished one portion of the requisite update.

The evolution of communicative technologies accomplished the second portion of the update for us. Archival statements are now rendered archival in myriad formats that span the analog and the digital. Any archival theory suitable to the present tense—to our current historical *a priori*—must take into consideration the role of different media formats. The archive underlying the present historical *a priori*, as well as that historical *a priori* into which we are now traveling, is perhaps more of a heterotopia than Foucault envisioned: we experience the archive aesthetically precisely because of the diversity in media formats that carry the archive's statements. They approach us through not only the visual pathway as activated by written text, but through video, animation, diagram, hypertext, intertextuality, screens, haptics, wearable devices, smart homes, smart cities, and even smart bodies. We reside in a heterotopia that puts us aside from the space-time

organization of the phenomenal world precisely by being engaged with a phenomenal world that is partly constituted by these heterogeneous and heterotopic communicative objects.

What remains to update is the identification of the site and mechanism of discursive transformation. I had addressed the former in Part II of this dissertation: the site of discursive transformation occurs in the liminal space between the image-as-thing and the technical image; between the mental map of what we might be and what we might create (the technical image) and our tacit understanding of who was and what is (the image-as-thing). To effect this last update, we must turn to the language of Foucault himself.

7.3.1 Three Types of Foucauldian Archive

Knut Ove Eliassen (2010) presents a careful analysis of three forms of archive that Foucault addresses. As he notes, the term 'archive' has multiple valences in the work of Foucault. While the multiplicity of definitions underlying a term have been criticized in other realms (and here I am thinking of critical analyses [*cf* Bryant, 1975] of Kuhn's use of the term 'paradigm' in his monograph, *The Structure of Scientific Revolutions* (Kuhn, 1996), which was so problematic that Kuhn himself later addressed it in an afterword to the monograph [Musgrave, 1971], Eliassen argues that the changing definitions of the archive in the work of Foucault signal not contradiction or sloppiness, but rather development.

Because Eliasson has already written about the three forms of Foucauldian archives—and with commendable clarity—I will draw from his work here. However, I will only give detailed attention to the definition of the archive. This is because it is the version of the archive which bears the most relevance to the current project: it is the archive of statements, discourses, and the historical *a priori* that emerges from the verticality of statements.

In addition to this particular archive—*l'archive*—Foucault also conceptualizes the archive as (1) a conceptual opposition to that of the institutional archive (i.e., *les archives*) and as an heterotopia. Although the heterotopia is of tangential relation to this project—it is the space that emerges through the combination of institutional archives and the phenomenological experience of their contents—it is a deep and broad enough construct to deserve its own specific work in terms of the Internet of Things. I will contradict Foucault in some small way when it comes to his treatment of institutional archives and their relation to the archive. For Foucault, the relation was minimal: in fact, at times he emphatically states that the archive is not the archives. It is possible, if not likely, that this is a rhetorical move on the author's part: a move intended to distance him from the critical poverty of archival sciences and vault him more clearly into the realm of intellectual history. (It is easy to assign this logic as a reason for his choice of the word 'archaeology' rather than 'archivology' as a descriptor for his method.)

Following each quote, however, I will explore the various uses of the archive in terms of the Internet of Things. (At times, too, I will expand on Eliasson's chosen quotes by contextualizing them in deploying other excerpts from The Archaeology of Knowledge [Foucault, 1982].)

First, Eliasson approaches Foucault's archive as a broad concept. This is the concept that presents itself to the reader through the unusual singularity of the world archive. As Eliassen points out (2010, p.34), the singular form of 'archive' is exceedingly rare in the French (where the word 'archives' constitutes the common usage). As he notes, this unusual form of the word signals its importance.

According to Eliassen, '[the archive] can be regarded as a counter concept, a strategic term, as one of its key functions is to serve as a stage prop in Foucault's criticism of other […] concepts that stress historical continuity and the transfer of historical meaning' (p.34). There is much that

can be gleaned from this initial impression of the Foucauldian archive. Perhaps most importantly, though, is the notion that the archive for Foucault exists as a means of analyzing difference rather than similarity. Whereas the historical work of archives is concerned with the extent to which ideas and traditions (i.e., cultural memory in a broad sense) are transferred from one age to another, Foucault's archive exists as a critical laboratory for analyzing the differences between one era and another: for highlighting discontinuity, change, and upheaval. (In Foucault's translated words: "I have decided to ignore no form of discontinuity, break, threshold, or limit. I have decided to describe statements in the field of discourse and the relations of which they are capable" [Foucault, 1982, p. 31].)

In light of this initial interpretation of the archive, it presents as an ideal sort of conceptual laboratory in which to analyze the Internet of Things. As we saw in Chapter Four, one of the key discourses underlying IoT is that of the future: in this future, one finds change. The change in question is clearly identifiable (through the findings presented in Chapters Four through Six) as the colonization of the everyday—and across scales both large and small—by data-extractive devices that are internetworked. Therefore, to approach the Internet of Things through the setting of the archive is to do so with an eye towards the differences IoT will bring about: it is to assume with some caution that IoT heralds a new era, a discontinuity or disjoint between the futures we envision and the world that we know now.

Eliassen continues to qualify this initial impression of Foucault's archive as the locus of a set of analytic tools that usage of which results in defamiliarization (2010, p.35). What he means here is that within the conceptual realm of Foucault's archives, documents and archival holdings are only that: they do not extend beyond the edges of their forms and consist only of their semantic contents. So, the role of documents in Foucault's archive is that of the carrier: not as a carrier of

rich intertextuality, context, and narrative, but of only themselves. Documents carry only statements, and the statements are the focus of archival analysis. (I much prefer the term archival analysis to that of Foucault's chosen term, 'archaeology.') It is through this approach to the document and its contents that defamiliarization is achieved: one seeks no further information that which is contained in a document in order to identify the statements that that document makes (and therefore makes possible).

By means of this defamiliarizing approach, Eliassen posits, we approach the key construct in Foucault's theory of the archive: the statement. Unfortunately, the construct 'statement' is wholly intermingled with the concept of 'discourse.' The two cannot reasonably be discussed separately.

For explication, I will turn directly to the words of Foucault:

> On several occasions I have used the term 'statement,' either to speak of a population of statements (as if I were dealing with individuals or isolated events), or in order to distinguish it from the group that I called 'discourses' (as the part is distinguished from the whole). At first sight, the statement appears as an ultimate, undecomposable element that can be isolated and introduced into a set of relations with other similar elements. A point without a surface, but a point that can be located in planes of division and in specific forms of groupings. A seed that appears on the surface of a tissue of which it is the constituent element. The atom of discourse (Foucault, 1982, p.80).

But, as a result of Foucault's chosen style of writing—a style in which he seems to work out his thoughts even as he writes, as opposed to the now-traditional form of telling a complete and pre-defined story—this initial approach to defining the statement falls short. If there is an atom of discourse (and a close reading of *Archaeology of Knowledge*, I believe, results in the identification of such an atom as a state of relationality, an in-between, a liminality), it is emphatically not the statement:

> To describe a statement is not a matter of isolating and characterizing a horizontal

> segment; but of defining the conditions in which the function that gave a series of signs (a series that is not necessarily grammatical or logically structured) an existence, and a specific existence, can operate. An existence that reveals such a series as more than a mere trace, but rather a relation to a domain of objects; as more than the result of an action or an individual operation, but rather a set of possible positions for a subject; as more than an organic autonomous whole, closed in upon itself and capable of forming meaning of its own accord, but rather an element in a field of coexistence; as more than a passing event or an inert object, but rather a repeatable materiality. The description of statement is concerned, in a sort of vertical dimension, with the conditions of existence of different groups of signifiers (Foucault, 1982, 108-109.)

So, the statement is that which arises—through its existence by means of an archival document, or something that is, in a way, archived—through the relational qualities of the world in which it resides, and the world that it co-constucts through relationality. The statement is the glue that emerges from the world it holds together: a world that is not necessarily continuous, but is divided across the temporal axis into various ages.

It is worth noting that Foucault, in the quote above, did, indeed, use the term 'materiality.' However, the term is not used in the sense of media theory or the media archaeology that would later arise from Foucault's non-treatment of materiality. Rather, in 'materiality' Foucault refers to a particular instantiation of the world: a being comprised of statements that both emerge from and constitute the world as it is known—a world that is known through knowledge comprised of statements and their recordings.

The reader is left with a jumble. The bedroom is untidy, the dishes have not been washed, and there is cat hair everywhere. There are any number of ways to structure an algorithm to clean the mess; there are also any number of points of entry by which one might gain clarity over Foucault's own statements. (And we must consider *Archaeology of Knowledge* as a set of statements: it constructs a world of statements, a means of understanding history by being a statement itself, and

therefore drawing together the signs of which a world is constructed into another, alternate construction.)[141]

Yet another confounding aspect of the statement is its invisibility. But how—you might ask—can a statement be invisible if the world as we know it, and in knowing it construct it, is comprised of statements? Statements are invisible in the same way that functioning infrastructure is invisible. They exist as logical (tacit) givens, primers for expectation and action; they form the context for the definition of a background or a foreground; they are the stuff of possibility. And this is key: in their relationally, statements not only give rise to the world of any given historical period, but they also give rise to *potential* historical periods both past and future: statements are both the limit of what can be said (in a reasonable way according to the verticality of a given historical period) and they represent the site of possible discursive emergence: the emergence of new statements by way of unexplored or unexpected relationality.

Eliassen further clarifies this statement-muddle:

> What Foucault puts forward is a theory of statements […] and more precisely, a theory of what might be articulated at a give time in history: "What is it possible to talk about?" (Foucault 1994, 1g, 682). He is interested in those statements that, under a particular set of historical conditions, may qualify as being true, and furthermore, the mechanisms that regulate why some statements and not other can lay claim to truth (Eliasson, 2010, p.35).

Importantly, as Eliassen continues, statements do not add up to archives, but rather the archive:

> *Archive*, Foucault writes, does 'not mean the sum of all texts that a culture has kept upon its person as documents attesting to its own past, or an evidence of a

[141] In a way, one can interpret the statement as autopoietic. The world of any given era is constructed of statements. But those statements can only arise in a given era. The era and the statement are symbiotic: through their coupling, their gathering, they yield a historical period.

> continuing identity; nor do I mean the institutions, which in a given society, make it possible to record and preserve all those discourses that one wishes to remember and keep in circulation' (Foucault, 1969, p.169) (Eliasson, 2010, p. 35).

That approach to statements would yield archives, not the archive. So, what, after all is the archive for Foucault? It is:

> […] first the law of what can be said, the system that governs the appearance of statements as unique events. But archive is also that which determines that all these things said do not accumulate endlessly in an amorphous mass, nor are they inscribed in an unbroken linearity, nor do they disappear at the mercy of chance external accidents; but they are grouped together in distinct figures, composed together in accordance with multiple relations, maintained or blurred in accordance with specific regularities; that which determines that they do not withdraw at the same pace in time, but shine, as it were, like stars, some that seem close to use are already growing pale. The archive is not that which, despite its immediate escape safeguards the event and the statement, and preserves for future memories, its status as an escapee; it is that which, at the very root of the statement-event, and in that which embodies it, defines at the outset the *system of its enunciability*; Nor is the archive that which collects the dust of statements that have become inert once more, and which may make possible the miracle of their resurrection. It is that which defines the mode of occurrence of the statement-thing; it is *the system of its functioning*. (Foucault, 1982, p.129)

But the Foucauldian archive is more than that, too. In the excerpt that follows, we see the core trouble with the Foucauldian archive in terms of its usefulness as a theoretical tool for the practice of contemporary history:

> The archive cannot be described in its totality and in its presence it is unavoidable. It emerges in fragments, regions, and levels, more fully, no doubt, and with greater sharpness, the greater the time that separates us from it: at most, were it not for the rarity of the documents, the greater chronological distance would be necessary to analyze it. [….] The analysis of the archive, then, involves a privileged region: at once close to us, and different from our present existence, it is the border of time that surrounds our presence, which overhangs it, and which indicates in it its otherness; it is that which, outside ourselves, delimits us. The description of the archive deploys its possibilities (and the mastery of its possibilities) on the basis of the very discourses that have just ceased to be ours; its threshold of existence is

> established by the discontinuity that separates us from what we can no longer say, and from that which falls outside our discursive practice; it begins with the outside of our own language (*langage*); its locus is the gap between our own discursive practices (Foucault, p. 130-131).

Once Foucault finally presents a positive definition of the archive (albeit a positive definition couched in negative definitions), the reader is left with an historical era that is periodized by its own statements, and therefore the evidentiary differences that arise between the statements of one era and another. But that is not enough, because that only refers to one instantiation of the archive—one appearance—and must be derived through comparison.

If the archive presents in appearances, always partial, then it becomes necessary to account for the means by which the appearance of the archive changes. One does so by again returning to statements: not to the statements themselves, but to statements as *things*. The mediation of the world (the mediation that both describes it and constitutes it) must necessarily impact the formulation of statements. In so impacting the formulation of statements, mediation also prevents certain statements from being made. Not only in a proscriptive manner, but in the manner of unrealizability. (For example: one could not possibly say that 100 million Americans took X billion steps on January 16, 2019 in any archival instantiation other than our own, and that aspect of it that presents to the databases and servers of the FitBit, Inc.) As I have argued in Parts I and II, the transformation of the archive is achieved through the accumulation of discursive transformations: theoretically, one instantiation of the archive fails to resemble itself once enough discourses have undergone transformation. (One might think of this as a just-noticeable-difference of the archive.) If discourses are comprised of vertical statements, themselves comprised of relationally, then the mediation of statements is one of the (if not *the*) logical locus of discursive transformation in the digital age.

One final aspect of the Foucauldian archive must be addressed before we can move on to the Derridean archive. That is the notion of the historical *a priori*. Fortunately, this concept is much more straightforward that the convoluted notions of statement verticality and the archive. The historical *a priori* is the given condition, never seen but always inferable, of the archive during any given era. The historical *a priori* is the structure of the archive that allows for the era as statement. It is the set of discursive conditions that form the cognitive, cultural, and societal infrastructure of the world in which an individual, or group of individuals, live. It is the very manifestation of the archive in lived and living terms—in actions as much as statements and events—that allows for certain actions to be taken, certain imaginaries to form, certain modes of being to be validated or invalidated. The historical *a priori* is the very boundary of what is possible and reasonable within an era—an era that contains, as I argued in Chapter Four, all of the temporalities from the *longue durée* and the *durée moyenne* to *l'histoire événementielle*.

I have provided this introduction to the Foucauldian archive because there are other theories bound to the Foucauldian archive which emerge, if not from it, alongside it. As such, I now turn to a discussion of one such theory: Jacques Derrida's theory of the archive. In doing so, it is my hope to update Foucault's archival theory in such a way as to account for embodiment, materiality, and the continuity of discontinuity.

7.4 Derrida's Archive

If, as has been said above, the past tense of the archive is not strictly a past tense, but one that projects forward into a future (perhaps Derrida would have referred to this as a past-future), then the relationship between archives as sites of materially embodied practice and the archive as site of proto-statements comes into view—there is an impression of it. What is in question here is

beyond the specific boundaries of the sciences—the more generalized relationship between the archive, explanatory narratives produced therefrom, and the world of experience/perception and memory that gives rise to *the human archive* as always already present, as ubiquitous. It is only in Derrida's theory of the archive of psychoanalysis (Derrida, 1998) that one finds a more suitable theoretical framework with which to proceed.

Derrida's *Archive Fever* is a topological narrative comprised of multiple subsequent beginnings in which Derrida performatively represents the echoing structure of the archive he describes through written text.[142] The performativity is most clearly apparent through his playful and confounding use of section headings: every section is a beginning, save for the shortest section, 'theses,' which sheds rather less light on the Freudian archive than the multiple introductions.

Because I am introducing a detailed analysis of Derrida's archive subsequent to that of the Foucauldian archive, the relationship between the two merits some discussion. First, the Foucauldian archive was the first to be described. Derrida did not publish *Archive Fever* until the late 1990s, while Foucault had already been working on his theory of the archive (his archaeology) in the 1960s. Ultimately, the dates on which these theories were first published is inconsequential: both theories create an archive that always already is. That is, the Foucauldian and the Derridean archive (from a structuralist point of view) existed long before the identification of them via inscribed scholarly communications.

What is more important about the relationship between Derrida's archive and Foucault's is, well, that there is a discernible relationship. A quote from Derrida—always the jokester—demonstrates a concrete relationship: 'Let us imagine in effect a project of general archivology, a

[142] There is precedent in the field of literary studies for talking about the topology of a text. See for example, 'Mathematical Topology and Gordian Narrative Structures," (Jenkins, 1992) in which the author argues for a unicursal Gordian knot structure underlying the narrative of Laurence Sterne's 'Tristram Shandy' (Sterne, 2009). Mary Douglass (Douglas, 2010) has also examined non-linear narrative structures.

word that does not exist but that could designate a general and interdisciplinary science of the archive.' (Derrida, 1998, p. 34). At first glance this appears as a typical Derridean musing. But it reflects lines found in Foucault's Archaeology of Knowledge:

> The never completed, never wholly achieved uncovering of the archive forms the general horizon to which the discursive formations, the analysis of positivities, the mapping of the enunciative field belong. The right of words — which is not that of the philologists — authorizes, therefore, the use of the term archaeology to describe all these searches. The term does not imply the search for a beginning; it does not relate analysis to geological excavation. It designates the general theme of a description that questions the already-said at the level of its existence: of the enunciative function that operates within it, of the discursive formation, and the general archive system to which it belongs. Archaeology describes discourses as practices specified in the element of the archive. (Foucault, 1982, p.131.)

Foucault went to great lengths to avoid the coinage of the term Derrida seeks. He divorces his theory of the archive from brick-and-mortar archives, from the archives of dust and pages—the archives he, himself spent so much time haunting in order to conduct his archaeology—in a rhetorical move. As briefly described in the preceding section, Foucault creates the archive so as to place himself squarely in the field of intellectual history, rather than the mere history of materials. But, as we have seen, the archive is inseparable from the materiality of archives and archival holdings: if the world is a manifestation of the archive—the vertical statements (whether events or things) that are given order and sense by their own contextual verticality, the discursive structures, the enunciative function that allows for the creation of the statement and its simultaneously reified discourse network, all of which give rise to historical *a priori* conditions that describe and differentiate one era from another—then the archive of which Foucault speaks through the assumption of the philologist's powers, is, indeed, an archives. The conceptual and the physical meet: they meet not in a way that prescribes the maintenance and accession, the preservation and ordering physical documents, but rather they meet at the level of a greater, deeper

discourse: the discourse of the physical as limited and bounded by the human-body-as-interface that meets objects possessed of their own physical characteristics. The archive emerges as both archive and archives through the interaction between the subject and the object.

Through media theorists such as Friedrich Kittler, Wolfgang Ernst, Marshall McLuhan, and Vilém Flusser, the archives that were so painstakingly dissected into the archive reassemble again into an archaeological archives: they are simply archives again. To 'imagine a […] a project of general archivology' is to imagine a world where Foucault's methods addressed the physical, the material. The wistfulness of the author—and author who speaks of ghosts and specters, an author for whom the world is rarely as interesting to others as it is to himself—choosing to use the word 'imagine' betrays the recognition of a long-past point of departure—a fork in the road, so to speak—wherein Foucauldian archaeology might have easily been a Foucauldian archiviology.

Still another point of overlap is to be found when Derrida discusses the relationship between the archive and archaeology:

> as we have noted all along, there is an incessant tension here between the archive and archaeology. They will always be close the one to the other, resembling each other, hardly discernible in their co-implication, and yet radically incompatible, heterogeneous, that is to say, different with regard to the origin, in divorce with regard to the *arkhe* (Derrida, 1998, p.92).

There seems little reason to invoke the notion of archaeology when discussing the Freudian archive other than to place such an archive in relation to the Foucauldian archive. That Derrida states they are radically incompatible deserves explanation. (It is because of this incompatibility that, I think, the Derridean archive can be understood as superseding the Foucauldian; and because

of this incompatibility that I ultimately elect the Derridean archive as the primary lens through which to view the archive of IoT.)

The incompatibility of these two archive stems from the motivations underlying their theoretical construction. The incompatibility presents as a fundamental similarity when approached with an eye towards deconstruction. This is a similarity that binds the two theories of the archive together: Foucault's search for discontinuity, and Derrida's search for the continuity *in* discontinuity, for discontinuity as a mode of continuity. We have already seen, in the previous section, Foucault's desire to seek out breakages, or points where discursive transformation amounts to a breakage—the point where one era becomes another. But where Foucault sought breakages, Derrida sought continuity: a continuity that is sustained by (conceptual) violence. One might assume that the desire for such continuity stems from his proud Jewishness—this would justify the inclusion of his explication of circumcision in *Archive Fever*—but, even if that were the case there is a more logical reason: the central tenets of structuralism require continuity.

In Writing and Difference, Derrida (1978) argued that any form of structure derives from a form of genesis: any genesis must already be structured. As such, he saw structuralism as flawed; but its flaw was one that allowed for productive thought: if structuralism is predicated on a certain continuity, then so must be that which resides in the negative space of structure. Whereas Foucault sought discontinuity in the form of discursive transformation (which must always already be couched in the continuity of structuralism), Derrida sought the continuity of The Other—of that which is not—by way of a limited embrace of structuralism. The continuity of structuralism allowed both Foucault's analysis of discontinuity and Derrida's analysis of the continuity of The Other: a continuity of that which is fundamentally discontinuous because it is never wholly realized, but resides as a specter. The deeper one reads, the more entwined the archival theories of

Derrida and Foucault become. Still, there are some more meaningful differences such as Derrida's choice to situate his theory of the archive in terms of Freud.

The archive of psychoanalysis proves an optimal set through which to play out a novel theory of the archive—or an implicit updating of extant, Foucauldian archival theory—or of an archive fever or drive. This is specifically the case because of the very trajectory of Freud's thinking with regard to the relationship between memory and substrate, or of the functional anatomy of memory. Such a relationship is implied in 'Interpretation of Dreams,' where Freud proposes that the composition of the psychical apparatus in relation to memory must be bi-partite (Freud, 1950). That is, that there must be two levels or forms of mental apparatuses, one of which is responsible for the receipt or experience of stimuli and another that is responsible for the registration of such stimuli in the form of memory, but that the two occur in conflict with one another: "Since writing this, I have thought that consciousness occurs instead of the memory-trace" (Freud, 1950). It is the Freudian notion that experience and memory, or perception and its registration, are diametrically opposed functions of the psychic apparatus that is to be found at the center of Derrida's archival theory. Indeed, it is the very processively violent conflict between experience and memory that provides impetus for Derrida's Freudian impressions.[143]

In exploring what he refers to as Freudian impressions, Derrida identifies three specific facets of the Freudian archive, each of which plays with the resonances of the term 'impressions.' 'The first impression,' as Derrida writes, 'is *scriptural* or *typographic*: that of an inscription' (Derrida, 1998, p. 26). The inscriptive impression of the Freudian archive derives from the relationship between substrate and the information that it bears as the result of the process of inscription. As Derrida writes elsewhere, the relationship between memory and a theory of memory

[143] The tension between experience and memory will later be discussed in terms of the relationship between hypomnesis and anamnesis.

is problematic because a theory of memory need not necessarily adhere to the metaphorics of inscription-as-writing, but tend to do so in the writings of Freud: "From a system of traces functioning according to a model that Freud would have preferred natural and from which writing is entirely absent, we proceed toward a configuration of traces which can no longer be represented except the by structure and process of writing" (Derrida & Mehlman, 1972, p. 76).

In this first impression, then, the reader sees the inherent conflict between writing as a form of prosthetic memory and any understanding of the actuality of memory. In its invisibility as an inscriptive technology (Weiser, 1991), writing constitutes a pervasive lens through which memory is metaphorically understood. The metaphor of the former dominates the phenomenon of the latter through the very process of attempting to differentiate inscriptively the process of memory from the process of experience. Put differently, the inscriptive textuality of archives becomes *the* site of prosthetic memory, a materially embodied metaphor for the relationship between experience and the memory of experience.

Derrida's second impression is somewhat closer to the common, conversational use of 'impression,' as in: 'it is my impression that ***x*** is not ***y***,' which implies uncertainty, as if to note that the speaker does not have all the facts or that the facts that are apparent may be incomplete; however in this secondary impression there *is* a limited perceptual awareness of *x* in relation to *y*. In the absence of a concrete concept exists a series of impressions:

> We have no concept, only an impression, a series of impressions associated with a word [archive]. To the rigor of the *concept*, I am opposing here the vagueness or the open imprecision, the relative indetermination of such a *notion*. 'Archive' is only a *notion*, an impression associated with a word and for which, together with Freud, we do not have a concept. We only have an impression, an insistent impression through the unstable feeling of a shifting figure, of a schema, or of an in-finite or indefinite process.
>
> (Derrida, 1998, p. 29)

It is this impression of the archive that renders Derridean archival theory the most appealing for my purposes here: for examining potential sites of difference between the archive as we have known it, and the archive as it will be should the vision of an ubiquitous Internet of Things be realized. In the feeling of shifting and purposefully open imprecision, or the apparent potential of a would-be schema, there resides the promise of novel archival readings, of the discovery of novel archival mechanisms which may account for the role of narrativity in Bowker's age of potential memory (2005), an age that concretizes more and more with the proliferation of IoT-enabled devices. This second impression provides the impetus to describe in a materially sensitive way, the characteristics of Derridean archival thought as it may apply to extra-Freudian archives—and, indeed, to the amendment of the Foucauldian archive.

Finally, Derrida discusses a third impression of the Freudian archive: that of the body of Freud, marked by circumcision as a symbol of family line and cultural-religious ethos, of Judaism. Circumcision, after all, comprises a physical impression on the body, and such an impression, such an inscription, bears in it a memorial meaning. This final impression is necessitated by Freud's writings regarding the historical origins of Judaism in his 'Moses and Monotheism' (Freud, 1955). It is here where the archive most clearly resides in the realm of the human, of human experience. That is not to say that it is the only way in which the archive touches the human, but rather that archival actions such as circumcision indicate the potential for a greater overlap between the archive and human experience than initially thought—certainly than was initially proposed by Foucault. The archive, via the evidence of circumcision, is potentially something in which we live and with which we interact. It becomes something of the present tense—the long present tense that I described in Chapter Four. The archive is phenomenological as much as it is structural: it is the

experience of structure where that which is structured is also infrastructured, rendered invisible or acclimated to the point of imperceptibility.

There are a set of what might be called Derridean Operators. By this I mean certain concepts, mechanisms, or conceptual mechanisms that order the archive. They are the forces—like that of gravity for matter—that guide the structure and functionality of the archive; that shape the impressions of the archive and the archive-as-impression. I will now introduce these operators and follow with a detailed excursus of them: the archontic (and the archon); the violent (sequential violence and jussive violence); domesticity (internality and externality); the prosthetic; and the spectral *a priori*.[144]

7.4.1 The Archontic, Embodiment, and Domesticity

To begin addressing the concept of the archontic, one must begin with the etymology of the term 'archive.' The origins of 'archive' (*arkheion*) are found in ancient Greek social hierarchy and the domesticity of those residing at the hierarchy's pinnacle (Derrida, 1998). The *arkheion* refers to the domain, literally the residence, of the archons, or 'those who commanded' (p. 2). Thus, the archontic nature of the archive refers to the ordering powers afforded to those commanding the archive, the space in which their influence resides—powers to include and exclude, to align and alienate, to consign or fragment.

The archontic, then, has much to do with determining the domesticity of archival or potentially archival discourses. (A potentially archival discourse could, for example, exist within

[144] The identification of these Derridean operators occurred while working with Geof Bowker, Cory Knobel, and Caitie Lustig on a project entitled, FeverBook, at the Evoke Lab and Studio at University of California, Irvine.

the archive of The Other: an archive that is created through the negative space of existence. In being a discourse active in the construction of The Other, it is also a discourse that might be active in future topological transformations of the positivist, structuralist archive of Foucault—the archive that gives rise to historical *a priori* conditions.)[145] But, as we have seen through the example of circumcision, the archive overlaps to some extent with that of human phenomenological world, then the archontic deserves framing within that context.

Consider the following statement made by Derrida: "There is no archive without a place of consignation, without a technique of repetition, and without a certain exteriority. No archive without outside" (Derrida, 1998, p. 11). That there is 'no archive without outside' further implicates the human body in the creation of the human archive. The body, our embodiment, is the means by which the outside—the world 'out there'—is created. It is the boundary between subject and object; without this boundary there is not only no archive, but nothing to archive. If the world began and ended at our own skin, we would not be concerned with memories lasting beyond the scope of the human life. The human life would be the full scope.

The archontic becomes a human characteristic. Not a characteristic like a personality trait—it would not be accurate to liken a given manifestation of the archontic to a stingy accessionist—but a characteristic that arises from our embodiment and that embodiment's placement in, and creation of, the world around us. That which is archival, if the archive be the place of statements (whether events, objects, or things), must be that which exists relative to the human: that which exists as contained within, however partially, the human *umwelt*.

We act as archons not out of explicit intention, but out of embodied and received physicality. The archive is ours to create or identify—while there might be statements that exist

[145] In terms of the human archive, the archive of the Other could present as 'that which is not' just as readily as it might present as 'that which might be.'

outside the realm of human experience and relativity, they must ultimately trickle down to the human if they are to be the subject of human thought or action—and in being ours, it is tied to our physicality: the body that is the mind, too. The archive exists because we are capable of interacting with it and therefore structuring it, structuring ourselves in and through history; through and by means of the things we partly comprise to perform history even in the long present tense. That is, we produce things by coupling with objects; those objects have futures, pasts, presents that are bound not only by their materiality (which is subject to degradation); but those objects are relevant to us only insofar as we can interact with them; the means by which we interact with them (or do/can not interact with them) shapes their entry into, and constitution of, the human archive. We are archons insofar as we are those embodied actants that named the archive, that baptized it as a human-facing space; that live through it by means of interaction.

7.4.2 The Violent (Jussive and Sequential) and the Prosthetic

I have argued above that human embodiment is the root of the archontic function. Embodiment, which bounds our ability to interact with and perceive the world 'out there' as series of objects, then, can be seen as the initial form of violence. As we will see, violence is central to Derrida's theory of the archive. We will also see that it is potentially synonymous with the Foucauldian notion of transformation as it applies of discourse.

For Derrida, the mechanism by which the archive constructs itself—or is constructed through the embodiment of its archons—is inherently violent:

> The gathering into itself of the One is never without violence, nor is the self-affirmation of the Unique, the law of the archontic, the law of *consignation* which orders the archive. [….] *L'Un se garde de l'autre*. The One guards against/keeps

> some of the other. It protects *itself* from the other, but in the movement of this jealous violence, it comprises in itself, thus guarding it, the self-otherness or self-difference (the difference from within oneself which makes it One. The "One differing, deferring from itself." The One as the Other. At once, at the same time, but in a same time that is out of joint, the One forgets to remember itself to itself, it keeps and erases the archive of this injustice that it is. Of this violence that it does. *L'Un se fait violence*. The One makes itself violence. It becomes what it is, the very violence – that it does to itself. Self-determination as violence. *L'Un se garde de l'autre pour se faire violence* (*because* it makes itself violence and *so as* to make itself violence) (Derrida, 1998, pp. 77–78, original emphasis).

The violence of which Derrida speaks is not cause for bodily concern. It is not the violence of fists, swords, gunpowder, or atomic bombs—although it is as old as the lineage of violence. Rather, for Derrida violence is the primary means of differentiation. It is that which separates The One from The Other: we, a collective One—collective insofar as we take on functionally similar bodily forms, and therefore are subject to the laws of the same human archive—both provide and constitute an initial violence. We do so by being; and by being in time, but being also aware that time exceeds that small period during which any one of us lives. We create an archive because we are aware of our mortality—Thanatos is omnipresent.

This violence, broadly speaking (and prior to engaging in a discussion of two different, but related, forms of violence) is the means by which the archive is shaped: it is the primary function of the archontic. The violent is the realm of accession and deaccession, of remembering and forgetting. What is remembered is remembered violently because that which is not remembered is lost; what is forgotten is forgotten violently precisely because it is forgotten, excised: 'The archivization produces as much as it records the event' (Derrida, 1998, p. 17).

This statement about archivization and the violence of production and recording should ring some bells. It resonates (although in reverse chronological order) with Drucker's notion of capta and with the notion that there is no such thing as raw data. Further, it echoes much of what I

wrote in Part II about the objectification of the subject: when data is extracted (like so much ore [Zuboff, 2019]) from the body of the subject, and when that data is fed back to the subject-user in the form of recommendations or nudges, that subject becomes the object of data. The data doppelganger becomes a subject—albeit a spectral subject—that acts upon the real human, now a human object. Through the act of data extraction and feedback, the subject from which it is extracted becomes an object. The data that records an event, also produces that event, and in so producing that event, re-produces the initial subject as an object. The initial subject is born again, once more unto the archive, not as a subject, but as an objectified subject. The prosthetic devices we have created—those IoT-enabled devices—have created us anew again in a new archive, an archive of violent objectivity where subjects are remembered as objects through their very inclusion in an archive that objectifies.

But in this concept of violence, one sees universal continuity: the archive *is* so as to be violent, so as to do violence; the archive *is* because it is violence. This is a statement that has no logical conclusion; there is no end to violence. But just as we, through being embodied and thus bringing into ontological being a distinct *umwelt*, we also enact a different kind of violence: one that does not bring about anew, but rather one that transforms. These two forms of violence, for Derrida, are described as the jussive and the sequential.

According to Derrida, jussive violence refers to the commandment, the commencement of the archive, which begs continuation. As such, and according to the logic provided above, we ourselves constitute the jussive violence: our bodies and their formation—their formulation and sensorial and perceptive abilities—constitutes the archive. It is the violent birth of the archive as a possibility. This is the initial violence, the violence closest to the intentionality of the archontic;

jussive violence provides a signifier for a beginning, the originary bifurcation of experience and memory.

The jussiveness of the human form is relative to the archive but it contains a flaw, or rather a clause that, if overlooked, presents as a flaw: the human body changes in time. This change is not merely one of physical or biological evolution (although surely that plays a role in the very long term). Rather, this change is one of media. Media are, after all, extensions of the human—extensions that, though processes of algorithmic evolution have come to resemble prostheses. So, we begin the archive with our own beginning, but it is possible that we begin the archive again through sufficient and major amendment of our bodies by way of extensions and the parallel phenomenologies that arise from extensions-turned-prostheses. Painted in this light, where jussive violence is potentially not limited to a singular occurrence, jussive violence beings to resemble the widespread discursive transformation that, for Foucault, gives rise to a new historical *a priori* condition. We begin ourselves and our archive again when we enact changes on ourselves or on our relation to the objects contained in the 'out there' of our phenomenal world. This idea fits rather neatly in-line with the Foucauldian treatment of the emergence of new eras: they emerge when discursive transformations are sufficiently deep or widespread so as to create a break with the era that gave rise to them.

We give birth to a new archive by means of ourselves and the alteration of what can and cannot be done within our *umwelt*. This is directly tied to Derrida's treatment of the prosthetic:

> Is the psychic apparatus better represented or is it affected differently by all the technical mechanisms for archivization and for reproduction, for prostheses of so-called live memory, for simulacrums of living things which already are, and will increasingly be, more refined, complicated, powerful than the 'mystic pad' (microcomputing, electronization, computerization, etc.)? (Derrida, 1998, p.15).

In the power of these new forms (microcomputing, electronization, computerization—and now machine learning, IoT, and quantum computing) resides the specter of another, a new jussive violence. A new archive duplicates and splits from the human archive to mirror it and colonize it. These apparatuses or categories of apparatus provide us with new, prosthetic means of interacting with the world around us, and therefore producing the world: we evolve it through our designed creations, and in evolving it, slowly evolve ourselves. Through each embrace of the prosthetic, we inch closer in time to a new jussive event: to a fundamentally new historical *a priori* born of that jussive event wherein the statement 'I am a human' is no longer compatible with its previous meanings, but instead resonates with the feedback loops of objectivist, reductionist data.

For Derrida, there is another form of violence: the sequential. Sequential violence is somewhat more difficult to account for: in that it is sequential—as in one century following another, one foot in front of the other, one grain of sand added to the soon-to-be pile—it is repetitive. The act of moving from one part of a sequence to another is by definition repetitive. As such, the sequential falls under our radar; it is the mode of living to which we have acclimated. Sequential violence, for the embodied archon, represents those discursive topological changes that do not necessarily constitute discursive transformations themselves, but rather rearrangements of relationships between the body and discourse. It is possible to see sequential violence as a form of violence that, repetitive and additive, ultimately gives rise to the new jussive violence of the extension-turned-prosthesis and the heralding of a new era.

As an example of sequential violence—and a sequential violence that could easily have been interpreted as jussive—consider the birth of the Internet. By this birth I do not mean the small network of computers created through DARPA at various universities, but rather the functional social Internet. This is the Internet of ICQ and GeoCities, of MySpace and 'allstu' dis-lists at

Kenyon College. At the point at which people could, on a regular basis and without much mental overhead, communicate with each other via the Internet, it appeared as though a new world was upon us. But from the present vantage—the emergence of IoT and the as-yet unseen permutations and reconfigurations of connectivity to which it will give rise—the emergence of the social, communicative web can be seen as a relatively minor instance of sequential violence. It was an instance of sequential violence that would snowball, each inch of hillside covered equal to one repetition, into an ultimate act of jussive violence: the final blend of the physical and the virtual in the form of the objectified-subject. (Recall that we are only now in a stage of subject-object chimera: we, too, are seen in the light of the sequential. But we are late in the sequence: a new jussive act is upon us.)

Sequential violence refers to the echo of the jussive across time, gaining resonance to such an extent as to provide the impression an exact originary and jussive violence's existence. It is the means by which the archive perpetuates itself – classification begets classification, and each act of violence exists as a sequential reverberation of the jussive violence that allows classification, that allows the conceptual bounding of phenomena extant in the world. For Derrida, and also for Flusser, sequential violence is most clearly described in terms of the concept of inscription.

7.4.3 The Spectral a priori

The archive is born of, and lives through, the archontic and the violent, the prosthetic and the domestic. Whereas for Foucault the archive presents itself (albeit for *post hoc* analysis) in the form of an historical *a priori*, the means by which the archive achieves itself through us constitutes what Derrida calls the spectral *a priori*: '…the structure of the archive is *spectral*. It is a spectral *a priori*' (Derrida, 1998, p. 84). This concept, so succinctly stated, is perhaps the most complex of

any presented by Derrida in Archive Fever. It is the point at which experience meets the archive in all forms of experience, including the experience of absence and the absence of experience.

There are two ways that one can read Derrida's use of 'spectral.' These two ways stem from the translation of French to English. Upon first reading in the translated context of Archive Fever, the use of the term 'spectral' seems clearly rooted in the ghostly – in that which is seen but unseen, present but not fully. This sense of the word is apparent because of the contents of the immediately preceding paragraphs, such as: "The question of the future of the specter or the specter of the future, of the future *as specter"* (Derrida, 1998, p. 84). However, upon a closer reading, spectrality takes on a dual meaning. On the one hand, spectrality is a reference to the violence of the One and the Other—a violence that creates an absence that is experience only mentally as an absence, and is therefore ghostly. On the other hand, there is homonymic relationship between specter and spectrum in the French (i.e., 'l*e spectre*' can refer to both a specter and a spectrum). To clarify this secondary reading, however, we must look beyond the text of *Archive Fever* to Derrida's *Specters of Marx*. It would be foolish, particularly when reading the work of so playful a linguistic, to overlook the multiple semantic resonances of a term.

'Spectrality' plays at the state in which something is neither absent nor present, but rather extant along a multi-dimensional continuum bounded by spatial and temporal notions of presence:

> What is the time and what is the history of a specter? Is there a present of the specter? Are its comings and goings ordered according to the linear succession of a before and an after, between a present-past, a present-present, and a present-future? […] If there is something like spectrality, there are reasons to doubt this reassuring order of presents and, especially, the border between the present, the actual or present reality of the present, and everything that can be opposed to absence, non-presence, non-effectivity, inactuality, virtuality, or even the simulacrum in general… (Derrida, 2006, p.48).

The very notion of spectrality, having as its primary referent the ghostly, that which is between presence and absence, therefore, transforms a discrete or binary state (i.e., present/absent) into a continuous one in which various shades of presence or absence are possible. The characterization of any temporally-bound archival state as 'a spectral *a priori*' The primary referent necessitates the secondary, the spectrum referent of *la spectralité*. The past recedes, embodied as it formerly was in the phenomenal world, into a state of memory (either prosthetic and inscribed, or internally and biologically maintained), which itself constitutes a state of semi-presence, a state of spectrality. The transformation of discrete into continuous has tremendous implications for the interpretation of Derrida's *a priori*: an *a priori* condition is not, in terms of the archive, defined solely in opposition to an *a posteriori* condition, but rather in terms of itself. The spectrality of the *a priori* represents degrees of *a priori*.

Therefore, the *a priori* of the archive is spectral in two ways: it is a ghost and it is a spectrum, the spectrum of spectrality, the liminal space between presence and absence. It is the world we live in tinted with the lens of the world that might be and the world that might have been: it is a fiction, but a fiction that rings truer than any fact. (One might even go so far as to say it is a matter of concern.)

First, the sequential echoes of violence originating at the initial point of jussive violence relative to a given historical *a priori* or era exist as a specter of archontic embodiment: the archive presents as the ghost of what might be precisely because it also presents as the contemporary form of the human *umwelt*. Second, and within such echoes, there exists a spectrum of *a priori* along which these echoes can be placed. The question then becomes of what is this spectrum representative?

The spectrum of *a priori* states—more *a priori* or less *a priori,* as opposed to *a priori* or *a posteriori*—qualifies the experience of the subject within the archive. One, as a subject, is always a part of the archive, and in being a part, is always an archon: the archon co-constitutes the archive because s/he is the *raison d'être* for the archive; hers is the body that defines the boundaries of the archive, the liminal space between the body and the world. There is a great deal of archival power in subjectivity. However, with the rise of an epistemic culture predicated on data extraction and the application of such extracted data through feedback loops, the subject has the option of no longer being a subject. The spectrum of *a priori* measures the extent to which the subject-object chimera demonstrates, or can be characterized by, either subject or object. At one end, one finds a pure subject; at the other, a pure object.

The spectral *a priori* of the archive alludes to an archive that is continuously in motion—a motion that is driven by the sequential violence of minor discursive transformations. The spectral *a priori* is omnipresent: it survives jussive violence, the emergence of a new historical *a priori* precisely because it is the formative state, the always and ever-present potential for jussive violence. The spectral *a priori* is like the state of prophase relative to cytokinesis (the process by which a cell divides and duplicates): but it is a prophase to cytokinesis that, unlike that which occurs in biology, can be reversed as if by some exertion of will. It is the ever-present possibility of bifurcation, of one era turning into another; it is the very sequential nature of the jussive, a kernel level command that allows for continued functioning even in the event of jussive violence.

And right now we are in a state that can only be described as spectral: we are neither subjects nor objects, but chimeras. What remains in this work is an exercise in speculation about what it might mean to be a human in the eventuality that the archive bifurcates, that a new historical *a priori* emerges, that the human is truly (once and for all, but always awaiting again) transformed.

7.5 Speculative Deductions About the Age of Potential Memory

> [The age of potential memory] is an epoch in which narrative remembering is typically a post hoc reconstruction from an ordered, classified set of facts that have been scattered over multiple physical data collections. The question is not what the state 'knows' about a particular individual, say, but what it can know *should the need ever arise.* (Bowker, 2008, p. 30)[146]

> The archive has always been a pledge, and like every pledge [gage], a token of the future. To put it more trivially: what is no longer archived in the same way is no longer lived in the same way. (Derrida, 1998, p.18).

In his 'Memory Practices in the Sciences,' Bowker (2005) calls upon Foucault to situate the archive as a prosthetic means of memory serving to render the world more governable. In doing so, he makes an extraordinarily creative move: juxtaposing the discursive, governmental role of prosthetic memory (of an archival structure) with the materiality of the records that constitute it: "the tools that we have to think about the past with are the tools of our own archive" (Bowker, 2005, p.18). This bears fruitful similarity to the excerpt from *Archive Fever* above: the archive produces the event even as it records it, because it records it.

The phenomenal present of the archive can be likened, for simplicity, to any given spot along a highway occupied by any given traveler: so long as the road maintains its integrity, so long as the functionality of the road (and all such a functionality requires) is present, the spot occupied by a driver is inconsequential. For Calvino's Marco Polo, Venice was, after all, only a refractive

[146] Bowker's specific use of the term 'State' is interpreted here as a placeholder for an institution, or a socially organized entity existing, or intended to exist, at a longer temporal rhythm than that of an individual subjectivity, thus necessitating prosthetic memory devices.

lens through which Venice could be viewed sequentially within the context of a specific narrator-narrative-reader constellation (Calvino, 2013). It is meaningful only in its relation to what has come before and to what will (presumably) come after, a mutually co-constructive dyad. Where this phenomenal present meets the production of documents about that present tense, one finds the preservative present. This is a snapshot of the long present tense as it relates to a given moment in time: a moment that is preserved through documentation, rendered durable for subsequent analysis.

Like one's position on a road, the preservative present becomes meaningless, or hollow, when it is segregated from its relation to the past (the beginning of travel) and the future (the destination), and is realized only through the spontaneous appearance of both/either. In this way, the preservative present of the archive eschews wayfaring for transporting, or hollows the meaning from a given position along a path for the sake of the path's beginning and end points (Ingold, 2007, p. 84-85). There is no discrete *position* in the act of preservation, only a continuous *here* in relation to imagined theres; nor a *now* during its execution, only *then* (as it presumably has been and will be). As such, archivally derived narratives bear primary relevance to the imaginaries of the present-future and the present-past which constitute the breadth and narrative boundaries of an archive. This present tense of preservation is core to Bowker's age of potential memory. We preserve so that we might know should the need ever arise; but in knowing via the synthesis of information from extracted data, we create an object about which we can know.

The current state of the archive in relation to the Internet of Things is one of a unique preservative present. Actions are preserved in the form of data—that is, they are represented and thus possibly subject to preservation. This is nothing new. But, the means by which preserved actions—documents or documental traces—are fed back to the subject that ostensibly generated the initial data does, indeed, constitute a new condition. At the level of the individual, as was

argued in Chapter Six, the feedback of data—objectified and analyzed traces of an actual event, of a phenomenon—fosters the growth of a data doppelganger. This doppelganger is, like all good doggelgangers, something of an interactive shadow: it follows the user-subject, it acts upon the user-subject as a parasite might act upon another organism. Leveraging the human desire to classify—and therefore to know—this data doppelgagner engages with the user-subject to create an idealized version of them: a version that the user-subject chooses to act in relation to. Through this act of feedback and subsequent feedback-derived action, we see the emergence of a separate archive: the user-subject is at once a subject with a distinct phenomenological view; the user is also, simultaneously, a objectified mirror of themselves. In this mirror, the user as a subject and an object resides simultaneously. They become chimerical: prescribed actions through algorithmic analysis, acted upon by their data.

Just what we might be able to know is now in question: with the rise of the subject-object chimera as a result of data-extractive and prescriptive modes of knowledge production (and living writ large) such as that which comes with the rise of IoT, it is no longer germane to assume that we know the external validity of the knowledge we produce. Knowledge born purely of description bears only a slight chance of describing experiences with which one is acquainted. We are witnessing a second great bifurcation: the emergence of the human user as a subject-object chimera implies a dualistic archive: an archive that is subjective and an archive that is objective. The rise of this dualistic archive implies a splitting. In ontological terms, the subject and the object are mutually exclusive. In practical terms—the terms that arise from IoT—the subject and the object overlap. The chimera resides in the interstitial space between two ontological modes.

Thusly, the archive is poised to split into two mirror images, but mirror images that are tinted differently. (It is not reasonable, I think, to assume that the human user will voluntarily bear

the burdon of dualistic ontological being—the cognitive overhead is simply to large. Instead, they will become the one or the other; they will become [again] the subject or they will become the object.)[147] One is subjective; the other objective. And remember: 'archivable meaning is also and in advance codetermined by the structure that archives' (Derrida, 1998, p. 18). When that structure is one that inherently objectifies, by virtue of the data-extractive mechanism that constitutes its mode of inscription, it is hardly known just how the human will be archived, and in being archived 'will [not] be lived in the same way' (Derrida, 1998, p.18).

One might reasonably wonder why I have chosen here to focus on the bifurcation of the archive into subjective and objective modes rather than seek a means to account for a new unification—one perhaps that flattens ontology in such a way as to render subject and object equal. Ultimately, I am a realist, and by that I mean I am a disappointed optimist. Jokes aside, while it is tempting to argue for the possibility of a wholly new philosophical turn in which subjects and objects are equal, the possibility of such a philosophy does not readily leave the stodgy ivory tower of cloistered departments. That is: it is tempting to delve into Object-Oriented Ontology (OOO) and to seek there a new human future; similarly, it is tempting to embrace Karen Barad's agential realism. As I have already, here and there, peppered this work with oblique references to OOO—references which will no doubt give the reader my impression of it—I have not yet actively discussed agential realism, although subscribers to that particular philosophy will likely have been suffering from burning ears up to this point.

[147] It is, with the aid of some difficult logic, possible to argue for the maintenance of a duplicated archive: but it will only be duplicated at the level of theory. In this condition, the statement, 'I am human,' will give the false impression of referring to the human as it has come to be known. More truthfully, such a statement will be colonized by the objectivism that allows for it. The human will be seen topically as a subjectivity, but will exist at a truer level as an object that is acted upon. The subject will take on the ontological status of the object, but the use of the term—and indeed the appearance of—subjectivity will remain.

It is not germane to delve into the finer points of Barad's work at this time. It is, however, appropriate to investigate the intention behind agential realism as Barad describes it and the extent to which much of the disconnection between the present theory of things and Barad's agential realism stems from linguistic differences:

> *Thingification*—the turning of relations into 'things,' 'entities,' 'relata'—infects much of the way we understand the world and our relationship to it. Why do we think that the existence of relations requires relata? Does the persistent distrust of nature, materiality, and the body that pervades much of contemporary theorizing and a sizable amount of the history of Western thought feed off of this cultural proclivity? […] I present a relational ontology that rejects metaphysics of relata, of 'words' and 'things.' On an agential realist account, it is once again possible to acknowledge nature, the body, and materiality in the fullness of their becoming without resorting to the optics of transparency or opacity, the geometries of absolute exteriority or interiority, and the theorization of the human as either pure cause or pure effect while at the same time remaining resolutely accountable for the role 'we' play in the intertwined practices of knowing and becoming (Barad, 2003, p. 812)

First, the desire of agential realism: 'to acknowledge nature, the body, and materiality in the fullness of their becoming…' This is, indeed, a desire near and dear to my own heart, and one that should resonate with the goals of the present work.[148] Where I differ, first, from Barad's otherwise brilliant and groundbreaking work is that I do not see—either as a result of failing faculties or perhaps a relatively youthful unwillingness—the pragmatism of this approach. We are, right now, witness to the results of certain modes of thinking. These modes are born of tacit ontologies and more or less explicit epistemologies that have emerged through the naturalized use of certain mediations in the production of knowledge—knowledge that has become both of and in the archive across time. These modes have similarly accreted a certain infrastructural weight: they

[148] This, too, is a goal that resonates with Latour's approach to matters of concern: the seeking of a deeper, truer realism that does not rely solely on objectivism, but rather on the existence of multiple, simultaneous, and possibly contradictory vantages relative to a given phenomenon.

cannot simply be overturned or forgotten, pushed aside for a newer or better philosophy. In that IoT is fundamentally about designed objects, the critique of these objects and the ontologies and epistemologies—and the phenomenological conditions beyond them—to which they give rise must occur at the level of the objects themselves, or more precisely at the level where these objects are implied in the production of things.

This brings me to my second disagreement with Barad's framing of agential realism: the perjorative use of 'things.' It is clear from the quote above that Barad falls prey to the same category error that Ashton (2009) fell prey to: to assume categorical homogeneity between 'things' and 'objects.' (In highlighting the categories of 'words' and 'things' it is clear that Barad equates 'things' with 'objects,' rather than taking a deeper, *more* agential approach to things as gatherings grounded in the ontology produced by the language that 'speaks us,' as Lacan famously stated.) Ultimately, I think this is a problem with chosen lexicons.

Still, a world defined through agential realism is a world in which it is possible to view a holistic archive: an archive of the human that accounts for the human in a state of becoming. While this is theoretically possible, I do not think that it is realistic given the inherent tension and incommensurability between the ontological statuses of subject and object: the future of IoT is one of corporations, governments, institutions, each of which (and all combined) come with terrific inertia. It will simply not be enough to provide the heads of those institutions with a new philosophy. Rather, we must expect that any possible change in the ontological and epistemological will occur as a compromise between the system(s) currently in place and any emergent or novel philosophy. (Such an emergent philosophy, then, will be like a horse designed by a committee: it will be a camel.) It is for this reason that I continue to rely on this notion of the bifurcation of the archive: I do not see a permanent resolution to this bifurcation other than that which has been in

the making since at least the Enlightenment: the objectification of the human, wherein the statement, 'I am human,' topically refers to an ontological state of subjectivity, but more truly refers to a subject that has been deemed a 'subject' through its objectification.

7.5.1 Speculative Deduction: The Age of Potential Objects

The archive must always already be an archive of things—of gatherings. If this is true, then the archive is also always already accessible in the present tense: we live in it just as we co-construct it by coupling with object to make things. We live in it because our embodiment begs its existence.

I have demonstrated two different kinds of things that populate the archive: on the one hand, there is the symbolic thing comprised of a subject that couples with a representation (as in the case of videos, texts); on the other hand, there is a type of thing that is 'real,' or rather comprised of a subject that couples with an object that has as its primary purpose not the conveyance of symbolic meaning, but the collection of data—the reductive empiricism the characterizes our current epistemic culture of computerized empiricism.

Surely it is possible to perceive of and characterize computerized empiricism as just another layer of symbolic meaning, but this would be a convenient oversight. Computerized empiricism has its roots in objectivism: we gather data about something so as to objectify it, and in objectifying it, we render it understandable, observable. The messy world becomes representable in a series of discrete categories. The natural, messy state of phenomena, becomes (de)naturalized into a world of observations; these observations, and the mode by which they are produced, in turn, become naturalized again. We live in a natural world that is, itself, the product of objectivist denaturalization.

The first type of ‘thing’ that I discussed—the subject that couples with a representative object—belongs to an archive not only of the past, or of some attempt to objectify and therefore render understandable the present tense, but to the future. It belongs to the future because the affordances that arise between the representation and the subject belong to a realm of imagination: of mental gymnastics that outline what-ifs and maybes. This type of thing is the type that signals the location of discursive change: it is through these what-ifs and maybes that the impetus for discursive change comes about. We imagine—project—ourselves into narratives or reductive, objectifying threads of points $\boldsymbol{x}$, $\boldsymbol{y}$, and $\boldsymbol{z}$ that are housed in the historical archive so as to provide the archive with motion: we do violence to the archive so as to create the history that gives us meaning.

The possibilities inherent in these imagined archival trajectories—extant between subject and symbolic, representative object—are grounded and tweaked through the wicked problems (Buchanan, 1991) that necessarily arise when such trajectories are realized in the form of physical objects, real objects. In this case, and once and for all, the ‘realness’ of these objects (as opposed to the symbolic qualities of representations) stems from the usefulness of the objects: they do not carry with them as their primary *raison d’être* the conveyance of some symbolic statement about the world. (Surely they carry these statements with them, but this takes us into the realm of critique, and it would be naive to state that objects only exist to foster critique.) Rather, their primary means for being is the use of them.

Through use—effected by the coupling of subject and object according to the affordances that arise between the two, in the space between ‘subject’ and ‘object,’ the skin of the moment, the actionable membrane—that which was well defined on paper, in blueprints, is released into the wild. The wickedness of the design comes to the fore, and in such wickedness resides the

potential—the absolute certainty—of emergence. Such emergence is then, by the very nature of subject-object couplings in the real world—re-entered into the archive as a statement. The symbolic value of the potential thing becomes real when its status as thing is realized: the real passes through the symbolic and back to the real. Through incremental change, or perhaps in cases through overt and apparent disruption, these statements become discursive transformation: they become possible through accident or emergence where once they were not possible, not even possibly identified as impossible or possible.

So, then, what little remains to be done in terms of the present goals of this project is to address, through speculative deduction, potential changes, potential transformations that the discourse of 'the human' might undergo based on the evidence already discussed.

7.5.2 Speculative Deduction: The Experience of Being Human via Things

> The trouble with what is troubling here is undoubtedly what troubles and muddles our vision (as they say in French), what inhibits sight and knowledge, but also the trouble of troubled and troubling affairs (as they also say in French), the trouble of secrets, of plots, of clandestineness, of half-private, half-public conjurations always at the unstable limit between public and private, between the family, the society, and the State, between the family and an intimacy even more private than the family, between oneself and oneself. (Derrida, 1998, p.90).

Yes, the archive is troubling. It is not only troubling at the level of theory, but at the level of practice: "secrets, plots, clandestineness, of half-private, half-public conjurations always at the unstable limit between public and private, between the family, the society, and the State […]." Trouble arises through practice in the form of access; access, in turn, is interpreted as privacy. Who

has access to archival records? Who has access to the archive? It is now unavoidable: we must return to a discussion of privacy. True to my intentions, I will not discuss privacy in terms of the extant literature about it. Nor will I engage again in the conjuring of Alice, Bob, and Eve. Rather, I will attempt to provide a valence-free description of the subjects and objects that now gather to form the thing that populates the Internet of Things.

As Derrida wrote above, archives have for a long time been associated with secrecy. Archives are the site of power because they are the site of knowledge. (One thinks of the librarian, Malachi, in Eco's The Name of The Rose who kept as much of his collection hidden as he rendered accessible.) The Stasi maintained an archive of deceit and treachery, of paranoia; the Library of Congress maintains an archive of invention and banality, secret to all those who do not know its function or points of access; the NSA maintains an archive of, well, who knows what? One thing unites each of these archives: their power is derived from, and distributed by means of, limited access.

If, as I argued in Part II, the things that populate the Internet of Things are a gathering, but not solely a gathering of one subject and one object, then archival access is fundamentally changed. Thus, if for Heidegger, the jug-character of the jug was in the pouring of its water, then the jug-character is distributed across two subjects and one object. But these two subjects do not meet; they are not coupled with the object at the same time.

I am having a dinner party. I pour water into a jug. A guest arrives. They are thirsty. They pick up the jug and pour some of its contents into a cup. They drink from that cup. There are two things involved in this scenario: first, me (subject) and the jug (object). I form a thing with that jug when I pick it up for the purpose of filling it with a liquid. A second things is formed when a guest picks it up for the purpose of pouring its contents into a cup.

But imagine if this were an IoT-enabled jug. Let's say that rather than its functionality be consumerist—as in reminding you to buy more of the liquid that is also produced by the producer of the jug, as in vertical integration—but rather that its functionality is environmental awareness. The jug monitors how much water you pour out in the course of a day to make sure that you, residing in a drought-ridden Southern California of 2030, do not exceed your daily allotment of drinking water. (Let's also imagine that other technologies are present which prevent you from accessing water by any means other than that jug.)

The thing that would be formed by my use of that jug would not be dyadic. Instead, it would be n-adic. The jug would appear to me as an object, and it would function as an object; but it would also appear as an object from the vantage of the Drought Time Water Bureau (DTWB, established in 2028 or thereabouts). The thing that is formed is now a thing with two subjects and one object. Or is it? The object, the jug, is not solely an object: it is a proxy subject functioning on behalf of DTWB. Because it functions as a proxy subject (collecting data and reporting back to DTWB), I am seen to be acted upon. I become the object of DTWB and the jug.

What this ultimately means in terms of privacy—or, rather, access to archival information—is that by acting, I am providing data, entering it into the archive, but I only have access to its feedback. This feedback is controlled (in this unfortunate drought scenario) by DTWB. As this network of subjects and objects expands, even within the boundaries of my own apartment, the implications of access to this archive of my water-behavior grow exponentially. It becomes not an instance of the control revolution, but an instance of revolting control. I become—in my actions, even those actions necessary for the maintenance of life such as drinking water—the object of some greater and largely undefined subject. (DTWB is largely undefined as a subject because of the grey area surrounding corporate personhood discussed in Chapter Four.)

When the n-adic nature of this thing colonizes not only the jug, but the television, the bedroom, the city block, then what emerges is something like a surveillance state: but it is not a surveillance state that is looking for anything in particular. Rather, it is a surveillance state that might look for everything, post hoc. The things we form through coupling with data-extractive, IoT-enabled objects, distribute data-driven power in an uneven way. Those that have, get.

7.5.3 Speculative Deduction: Experiencing (as) Objects

> I asked myself what is the moment proper to the archive, if there is such a thing, the instant of archivization strictly speaking, which is not, and I will come back to this, so-called live or spontaneous memory (mneme or anamnesis), but rather a certain hypomnesic and prosthetic experience of the technical substrate. (Derrida, 1998, p. 25)
>
> Electronic mail today, even more than the fax, is on the way to transforming the entire public and private space of humanity, and first of all the limit between the private, the secret (private or public), and the public of the phenomenal. (Derrida, 1998, p.17)

I am concerned here with the last part of the first quote: "a certain hypomnesiac and prosthetic experience of the technical substrate." I am also concerned with, 'the limit between the private, the sector (private or public), and the public of the phenomenal.' These statements are Derrida at his phenomenological best. And again, an appropriate interpretation of these lines requires some disciplinary gymnastics. Indeed, these gymnastics will go against the grain of traditional interpretation. Early on in this work—and, indeed, through the development of its arguments—I have argued that the archive is always already around us: it is a human archive. It is the world in which we live, bounded not only by concepts and the possibility of statements (e.g., speech acts), but bounded by the skin of the human body, by human embodiment itself. As such, the following interpretation of hypomnesia stems from embodiment precisely because of the role that

embodiment plays in the formation of the archive. It is a discussion of hypmnesia, anamnesia (and the necessity of a third category, hypermnesia) in relation to the very limits of embodiment and the development of prosthetic memory devices that begged the coinage of 'hypomnesia.'

Hypo, the Greek root, means 'under.' The application of *hypo* to *mnene* (or any of its forms) does not necessarily mean the substandard or sub-normal functioning of memory. It meant for Derrida a form of memory (and therefore experience) that is somehow less than its antithesis, anamnesis.[149] Where anamnesis refers to the act of recalling, hypomnesis refers to an imperfect recall—a recall that is made imperfect by the rise of prosthetic memory devices, such as writing. It is this particular reading of hypomnesia that allows for consideration of the experience of the archive in terms of the media substrates that carry its inscriptions. These substrates carry memory for us: they give rise to something other than anamnesis, or something other than a condition of purely bodily remembering. That is, this 'hypomnesiac and prosthetic experience of the technical substrate,' speaks to the phenomenological awareness of the boundaries that define and limit interactions with given substrates. It speaks to the primitive human archive as it existed up to the emergence and proliferation of the digital archive, the Internet.

For Derrida, the state of anamnesis—a living state bounded by the experience of life in the human condition of embodiment complete with the same shortcomings of attention and memory described earlier by Kevin Ashton (2009) in relation to the emergence of IoT—is brought about only in relation to the potential state of forgetting. In order to devise a category of recall, one must

[149] In a contemporary sense, it is perhaps easier to think of a triad of related concepts rather than the dyad of hypomnesis and anamnesis. To this dyad, I would add hypermnesis. Paradoxically, hypermnesis would arise as a condition of hypomnesis: hypomnesis results from the externalization of memory. That such externalization—certainly in Plato's time—would have occurred via a limited set of material substrates, none of which were accessible in the sense of Internet accessibility, results in the experience of hypomnesis (or the need to remember fewer and fewer things) seems an unlikely condition from which hypermnesis (i.e., the remembering of everything) to arise. Nonetheless, with the externalization of memory and the contemporary ability to access such (digital) externalizations through the Interent, and the durable coupling of information-objects (e.g., smartphones) with the human body, hypermnesis can, indeed, be argued to arise from an initial hypomnesis.

also devise a category of forgetting. Bernard Stiegler, an early pupil of Derrida, reached the following conclusion:

> the Platonic opposition between anamnesis and hypomnesis—together with the exclusion of technology from the sphere of memory, thought and the logos—represents nothing less than 'the denial of the originary technicity of memory Stiegler, as cited in Bradley, 2011, p.4).

In the current condition of a bifurcating archive, the simple dichotomous relationship between hypomnesia and anamnesia no longer applies. We now remember less so as to remember more. We have naturalized the externalization of memory through the use of extensions; we have naturalized the use of extensions, and evolved their use to such an extent, that these extensions have become prostheses. In being prostheses, they are contained within the greater conceptual category of 'memory.' I know what my smartphone records if I have access to my smartphone and its recordings. As Arthur Bradley writes:

> Any attempt to posit a theory of technological alienation as the deprivation of some primordial mental or physical capacity thus merely recapitulates the Platonic critique of artificial memory (hypomnesis) from the perspective of recollection (anamnesis). For Marxian philosophers of technology, then, any appeal to an originary human essence that is only subsequently alienated by the advent of the age of the machine must be put into abeyance […] (Bradley, 2011).

This hypomnesia, however, does not apply to situations wherein the technical substrate—the inscriptive substrate, the material manifestation of the archive as interaction point—is novel. Rather, hypomnesia becomes hypermnesia: we become overly aware not only of the data of memory to which we might not have previously had access, but of the very prostheses that render such recall possible. (One might readily approach such a state of hypermnesia as a state of absurdity.) In this state of over-awareness—and think of the last time you used a new interface for

the first time—our body as our primary point of interaction becomes The Other: it becomes the negative space of itself, where the body is positively defined as that with which, though experience, you are familiar. Through the use of novel memory-prosthetics, we achieve a state of hypomnesis relative to ourselves as we were, but also construct a new ground truth for the condition of anamnesis: we naturalize the use of prosthetics such that memory prosthetics are enrolled into the human body. But it is also this naturalization of hypomnesis in the form of a new anamnesis that the bifurcation of the archive is achieved: the body is still the body so long as it is separable from prostheses. In being separable, so, too, is the subjectivity of the body separable from the objectivity of data-driven memory: of the new anamnesis that arises from the ubiquitous externalization of memory.

The archive of the IoT—an archive where the archontic is stretched beyond the boundary of the skin to include the earth's electronic skin, the data-extractive prostheses we enfold into our *habitèles*—emerges from this othering of the body. It emerges from the point at which our body does not end at our body, but extends to the prostheses—the FitBits, the Lifts, the Harmony Hub, the smart traffic light. Hypomnesia emerges as a descriptor of the human's memory of themselves: the memory and recall of the boundaries of their body. Through the development, use, and proliferation of prostheses, we forget our bodies for the additions we make to them. The body becomes extended; recall outsourced to not what we should remember, but that which we might recall if the need should arise. Where as Bowker has referred to this condition—albeit tangentially—as the era of potential memory, it must also be the age of potential objects: when the body is forgotten, when it is resided in under the condition of hypomnesis, it becomes an assemblage of memory prosthetics: the exact constellation of those prosthetics in-use at any given time render the body, and the subjectivity that is tied to it, a complex assemblage of objects.

In experiencing our bodies, or in deriving knowledge of our bodies that we then incorporate into our bodily actions, through prosthetic devices of networked data-extraction, we experience our bodies as objects. The objects that extract data from us present it back to us through GUIs or vibrations or aural alerts, and we enfold that feedback into our actions: we are prescribed and nudged towards wholly new and dissociative experiences of ourselves as subjectivities. These experiences are so dissociative, so new and so othering that the body as subject—as the locus of subjectivity—is no longer a subject, but an object: it is an object that is constructed through the emergence of a new anamnesia that stands as a result of the naturalization and tacitization of hypomnesiac technologies.

This logic is fully in-line with the violence that defines and subtends Derrida's theory of the archive. Through the extension of the body to include prostheses (i.e., data-extractive objects), we create an archive that is self-effacing by means of violence. "What is no longer archived in the same way is no longer lived in the same way" (Derrida, 1998, p. 18). We will not live our bodies—through them, by means of them—in the same way because they will no longer be the sole and unaffected points of archontic power: those points will extend out into the network of IoT-enabled devices, always already nodes in an n-adic constellation of Other subjects, Other objects. This ubiquitous extension culminates in the apotheosis of extension: that of prosthesis. Such prosthesis extends the categories of anamnesis and hypomnesis to include that of hypermnesis, wherein the body (and the experience of the body) is rendered an object (and objective) because the body as the seat of memory is extended into assemblages of mnemonic devices.

Derrida writes: "...the technical structure of the archiving archive also determines the structure of the archivable content even in its very coming into existence and in its relationship to the future" (Derrida, 1998, p.17). The futures we are creating through the incremental proliferation and

infrasturcturalization of IoT will be determined by the structure of that archive. That is, an archive of IoT is only capable of archiving that which can be archived via IoT: it is only capable of archiving data that has been extracted from the city, the home, the body. The human archive of the future, the human archive as it resides alongside the archive of IoT, thusly will be an archive of reductionist objectivism, an archive of computerized empiricism and imperialism wherein the human condition of embodiment supports the ontological position that human subjectivity is reducible to that of an object.

7.5.4 Speculative Deduction: A New Documentalist Cultural Technique

The specter of Ranke has haunted this project. In describing the long present tense to which our current historical *a priori* condition—or perhaps the two sets of conflicting and overlapping historical *a priori* conditions that are currently visible, as in that which came before and the 'futurological trope of the Information Age' (Day, 2008, p.2)—we entered into a sort of materialist history. But not a history as told through the semantic content carried by materials, but a history of the materials themselves. A history that looks forward through a process of speculative deduction rather than one that looks backwards and inwards from the present.

As a principle interpreter of the works of both Paul Otlet and Suzanne Briet, the two central figures of the documentarist movement, Day provides perspicuous insight into the documentalist tradition. As such, his work needs only some small updating to suit our present purposes. It needs to be updated or viewed through a more contemporary lens: one that addresses the filtered light of an IoT-enabled future that has only concretized since the publication of those works. Still there is much to be gained from them.

Day writes that, ‘Humans assimilate themselves to the technologies, but then these technologies shape not only further technologies, but the very nature of human being itself through their infrastructural, psychological, and increasingly, physiological incorporation into the human environment and body” (Day, 2014, p.89). I could not agree more with this statement, but fear that it occurs in too far removed, too distant a future. The greater context for this statement is a chapter from Indexing it All that approaches the production of communicative AI (that is, robots designed to pass the Turing test). I maintain that the consideration of such a future is too risky if fascinating. What is called for instead, is a theorization of the feedback loop between the subject and the object, between the user and the used, in the long present tense. It is one thing to theorize the possible realization of *bona fide* artificial intelligence—and by this I mean the type of artificial intelligence that defined the movement from the 1960s to the 1980s before the common sense turn—but it is another entirely to consider the possibility of achieving such a state of AI—which it always already a moving target given that our understanding of intelligence necessarily varies across time periods, each defined by sets of technologies.

The means by which humans assimilate themselves to technologies, and the means by which technologies reshape the experience of being human, are the very means by which the concept of artificial intelligence—the possibility of the singularity, of the android with a heart—evolves. Because it evolves (although it devolves, too) it does not reasonably present as a state of technology that can ever be achieved: it will always be becoming, always shifting. So, while the theorization of a feedback loop between subject and object in terms of AI is interesting, it is not as productive as it might be.

But still, Day (Day, 2014) was onto something. He writes, ‘Both primary (intrinsic to the agent) and secondary (contextual) powers or affordances work in reciprocal relation to one another in the

constitution of beings and things as potential actualized powers of expression' (p.109). He is right there: right in the space between the subject and the object, in the space where things are created. But he does not go far enough: in theorizing a distant future achievement such as the epitome of AI, he takes for granted a certain ontological stability. That is, he assumes that the relationship between subjects and objects remains a constant across time. As I have demonstrated in the first two parts of this dissertation, there is ample evidence to consider this an inaccurate assumption.

That Day assumes the stability of the ontological membrane separating the subject from the object is nowhere more evident than in the following lines:

> The expressive power of a being—made up [of] its experiences and its personal skills (its expressive 'toolbox' built from experience)—constitute each individual as a unique singularity of expressive traits—a self. Just as individuals develop into singular selves over time, with their own traits, preferences, and powers, so do species, though with sometimes poorly defined, but still real, sets of unique demonstrable powers. In short, the ontological constitution of being as sets of powers is evolutionary and developmental, shaped and afforded by power of their environment and the pressures put upon and shaping the beings concerned. (Day, 2014, p. 110)

It is clear that Day sees the development of the being, the reification of its ontological status as subject, in evolutionary (and therefore historical) terms. What is troublesome in this formulation, however, is the latent distinction between the natural and the artificial. Day admits that the environment plays a large role in the shaping of the subject. But this environment seems implicitly relegated to 'natural' objects: water particles that constitute humidity; minerals in soil; food sources and the like. But this formulation, this reliance on the natural/artificial divide requires more nuance, more specificity.

I have argued earlier that we know nature as natural through its empirical investigation, and therefore its denaturalization. To reach a level of abstraction where the natural—that which is

known through empirical observation—is used as a concept to explain the formulation of a subjectivity is to admit (tacitly) that non-natural forces shape subjectivity. We cannot know ourselves in terms of nature unless we know nature; and since 'man's emergence from his own self-imposed nonage' (Kant, et al., 1996), we do not accept knowledge about nature that is not empirically grounded. Nature is abstraction, reduction, and objectivism to the point of standardization. It is anything but natural.

According to this logic, then, objects in the environment always exert force upon the shaping of a subjectivity, including those objects that do not fall into the (sieve-like) category of the natural. The human's own designs feed back; they assimilate themselves into our being just as much as we assimilate ourselves into them. Through the act of providing more explicit feedback—think of the graphical representations of data extracted from IoT-enabled devices which serve as the impetus for behavioral changes, as well as the relocation of agency that is involved in enrolling into an infrastructure of such extractive devices—the (designed) object exerts at least as much influence of the formulation of the subject as does that which is natural. Through durable coupling of subjects and objects that produce the things to which IoT refers—and here think of smartphones, rarely out of one's reach—the human subject is combined with the inanimate object. Indeed, the object exerts subject-like influence over the human user: the user/subject is acted upon and therefore takes on characteristics of the object. We return, again, to the notion of the chimera.

The chimera stands in stark contrast to the notion of '*homo documentator*' proposed by Suzanne Briet (2006 as cited in Day, 2014): "'*Homo documentator*' must prepare himself [sic] to take command—with all his sense awake—over the robots of tomorrow. The value of the machine will be that of a servant" (p. 89). This needs to be approached with some mental gymnastic ability.

First, there is the issues of senses. Second, the notion that the machine will be a servant. Third, that there is value in its status as servant.

As I argued in the second part of this dissertation, the futures of IoT—the imagined and implied transformations of the human—do not arise from all of the senses. They arise primarily through visual and auditory pathways: they arise through their instantiations on screens of various sizes and durability. We see already, then, that the future of *homo documentator* is not one wherein all senses are awake.

The machine is already a servant: robot stems from the Czech word for servant. But that is of little import. What really matters here is the functions the servant will carry out. In enrolling into the imaginary of IoT, we as subjects are simultaneously augmented and therefore reduced by durable coupling with extractive devices. We are assigning a great deal of responsibility to these servants. It is as though we are outsourcing our own cognition: Narcissus outsources his reflection to the perfect digital pool in hopes of becoming that object of his love, his future ideal self. He cannot possible achieve that ideal: there will always be one more improvement, one more software update, a new connector, a new series of protocols. In so outsourcing or offloading we willingly give the construction of our subjectivities over to objects. We receive ourselves not as subjects but as hybrids of subjects and objects. We become through data-driven knowledge, extracted by IoT-enabled devices, that we (in the absence of such devices) could not possibly produce.

This relates to the new documentalism. Day (2008) writes:

> The founders and leaders of European documentation were advocates of documentation as an upcoming profession, distinct from librarianship, based both within and serving the development of science and modernity. As an organized system of techniques and technologies, documentation was understood as a play in the historical development of global organization in modernity—indeed, a major play inasmuch as that organization was dependent on the organization and

> transition of information. It was within the context of a 'scientific' culture of modernity that documentation could be understood as not simply bibliographical technique but as a cultural technique (p. 7-8).

Through durable coupling between subjects and extractive objects, the human of an IoT future necessarily becomes a documentalist. Through the use of IoT enabled objects, their value predicated on the value of the data they extract and often disguised by notions of convenience or efficiency, they produce or are participants in the production of infinite amounts of data, infinite bits of documentation. The documentalists saw documentation as a cultural technique, they hit the nail right on the head. Where they perhaps fell short was in the interpretation of the epistemological impact this documentalism would have given the emergent properties a documentalist infrastructure would display.

The material forms that our documents take has a direct bearing on topology of the archive. Indeed, it has often served for taxonomic rubrics in unexpected places. Take, for example, Ishmael's use of the book—its physicality—as a system of organization for his layman's cetology in Herman Melville's Moby Dick:

> First: According to magnitude I dive the whales into three primary BOOKS (subdivisible into CHAPTERS), and these challenges comprehend them all, both large and small.
>
> I. THE FOLIO WHALE; II. The OCTAVO WHALE; III. The DUODECIMO WHALE.
>
> As the type of the FOLIO I present the Sperm Whale; of the OCTAVO, the Grampus; of the DUODECIMO, the Porpoise.
>
> (Melville, 2003, p.97)

This is but a small example of the role that books as material objects play in the organization of our knowledge. In categorizing whales, the greater and lesser Leviathans of the novel, in a way

analogous to the size of different classes of books, Melville's Ishmael makes two simultaneous statements: (1) that the physical characteristics of objects belonging to one superclass might be used as analogy to organize the objects belonging to an entirely different genus; (2) that the whale, in being organized according to the size of objects that might carry finite (natural[ized]) knowledge about it, is in fact a source of knowledge. That is, the whale becomes object that can be reduced to certain characteristics, which might then be represented in the pages a book... of the book of nature.

Consider this representation in terms of our earlier discussion of technical images. This constitutes an early step into the universe of the technical image. The whale as it is known on paper does not exist. That is, representations of the whale that are recorded in books of science or naturalism constitute aggregations. (One might think of books of human anatomy in a similar way: the body in a textbook is but a roadmap, not a one-to-one correlation of each individual's anatomy.) These aggregations, then, upon accumulation and review, take on the form of prototypes: they represent a general category of object, and it just so happens here that the object in question is a whale.

Through its representation in a book—the primary step of which for Ishmael is to liken the physicality of the whale to the physicality of the book—a technical image of the whale is constructed. The image of the whale that is constructed via the binding of a book, the collection of disparate empirical evidence derived from numerous whale-objects, is a synecdoche: it stands in with the term 'whale' for each individual instance of the animal-object described by that term (and there that animal is most certainly an object, seen as a point of extraction not only for oil and bone, but for information). In this way, the book stands as a sort of passage point amidst the nineteenth century naturalist: the object of that naturalist knowledge (the whale) and the creation of a standardized representation (technical image) of that object. Without the book, one might argue,

our understanding of the whale would be very different. The whale takes its shape through the technical image of the book.

Perhaps the most widely discussed earlier example of this is the work of the French encyclopedists, Diderot and d'Alembert. The *Encyclopédie* represents one of the first attempts at the representation of universal knowledge in bound format. The creation of that fantastic set of volumes constituted a large step towards the creation of the technical image (Bender & Merrinan, 2010): it stood as exemplar for the practice of inscribing, standardizing, and offloading empirical knowledge of the world in a standard that is extra-bodily. Memory takes the shape of the page; in existing beyond the realm of the body, the page ascribes to the object of memory its own physical characteristics; knowledge represented on the page, then, cannot be reduced to knowledge that is contained in memory (within the body); the understanding of the world becomes dependent on the material substrates that carry it; the technical image is born. The world as it exists in the pages of the *Encyclopédie*—or the book writ large—is a vision of the world through which we pass even as we reside with our feet on the grounded soil.

Two somewhat more specific examples will shed further light: (1) the commonplace book; (2) Vincent Placcius's *scrinium literatum*. Both of these examples demonstrate the extent to which the material form of information is used not at the level of general knowledge production—as in, say, the scale of the university or domain-specific scientists such as cetologists—but at the level of the individual. Moreover, both demonstrate the construction of personalized, tailored technical images of the world.

Commonplace books are relatively simple objects. They represent roughly 17th through 19th century forms of books of quotations. In them, an individual author records various passages from the works they are reading in order to better remember them, or to create a sort of portable reference

work. (These were also printed for mass consumption, in a form not unlike a Great Quotes website today.) Through the creation of a personal commonplace book, the reader—whether she be the author, too—creates an oblique technical image of their worldview. That which they find to be interesting or noteworthy (literally) is filtered through the physicality of the book. The world is therefore subjected indexing, to cross-referencing, to marginalia and addenda. It would be too strong a statement to assign directionality or causality here: the book arises as standardized form of technical image just as the technical image feeds into the world. To be sure, it is a feedback loop, but I am not willing to argue (nor do I think it necessary) whether or not the chicken preceded the egg.

For a treatment of the *scrinium literatum*, or literary closet, I turn to Ann Blair's (2010) description, which, together with the closet that arises through that description, presents as a metaphor for the state of the archive in the late 17th century. Not only, however, does it serve as a metaphor for the state of the archive, it transmits assumptions about the durability and stability (and provenance) of information contained in the archive. Not only does an abstracted technical image arise through the aggregation of inscriptions—a technical image derived from the meeting of semantic content and material form—but the technical image becomes re-inserted into the physical world. The literary cabinet becomes a worldly container for the technical image: in the creation of a technical image via inscription upon a substrate, the user-author-curator creates a physical object in the world that contains that technical image. The technical image is fed back in a material form into the world it describes; the world thus moves closer to being what is represented in the technical image. The technical image becomes part of the world, not a mere description of it; it becomes a material instantiation with which a subject-in-the-world might become acquainted directly.

The world of today—here in the Age of Potential Memory—contains numerous modalities of knowledge and knowledge representation, manifold folds in the cloth of the technical image, that did not exist (and indeed only arose) at the time of the *Encyclopédie*, the commonplace, or the literary closet. But just like the creators of those documental forms, we are documentalists—albeit documentalists at the opposite end of the temporal spectrum. Wherein they encyclopedists and early book workers appeared in the prophase of documentalism, we appear now at its culmination: at the point at which documentalism has, indeed, reached the status of a cultural technique.

But this cultural technique is more complex than could have been envisioned by Otlet or Briet. It is a cultural technique that erases the culture from which it was born. The documentalism of IoT—the pervasiveness of data collection, the documenting of the world through prosthetic sensors and networks—gives rise to a world of reductionist representations. When that world—the inferences that are achieved through the analysis of such representations—is fed back into the experiential world (the world where subjectivity is not yet objectified), it creates a hybrid world: we exist between ourselves and the representation of ourselves; we exist between our own subjectivity and the objectified representation of our subjectivity.

Screens are everywhere. Our smartphones, as I argued in Part II, are not so much devices as they are wearables. We carry them in our pockets and our bags—new lines of blue jeans are even produced with 'smart phone pockets.' Thus, in carrying these screens with us, we carry the objective archive with us. It invades and colonizes our otherwise subjective world. Objectivist behavioral recommendations (prescriptions and proscriptions both) become heuristics for behavior: they become the boundaries that define our possible statements, actions, and events. In the feedback loop between IoT-enabled extractive data, the analysis thereof, and subjective actions taken based on recommendations, we find the emergence of a new potential archive: we locate the

contemporary mechanism of discursive transformation. The One becomes The Other; the archive undergoes an apparent bifurcation; the viability of the newly formed, secondary archive, depends on the adoption of and proliferation of the statements it allows.

7.5.5 Speculative Deduction: Acquaintance as Description

Although much of this dissertation involves the questioning of dichotomies, I'll begin this section with one: formal and informal knowledge. Broadly, we might think of formal knowledge as that which is produced by systematic inquiry (such as the scientific method, hermeneutics, etc.); we might, then, think of informal knowledge as that which is derived from non-systemic inquiry. The category of informal knowledge, then, might include daily practices, heuristics for behavior, knowing how to get to the Disney Concert Hall in Los Angeles from downtown Long Beach via the Blue Line. Any way you divide formal and informal knowledge, things are implicated in the maintenance and construction of these knowledges. The extent to which they are implicated has much to do with the temporality of being: we are always already being in a present tense, but that present tense does not unfold in a vacuum. That is, the present tense is related to our sense of the past and the directionality of the present as it leads into the future. Things—subject-object relationships—are the stuff that binds these tenses together. It is through things that a sense of continuity or discontinuity is achieved between the past and the present and the future.

In the midst of these philosophical and media-theoretical treatments of things, newness can still be found in the scholarly treatment of 'things.' Such newness resides in the emergent approach to things embodied by practices in anthropology, cognitive science, media studies, the arts, and informatics, to name a few: "…it is becoming of paramount importance to come up with new

cross-disciplinary synergies, capable of transforming our understanding of the relation and co-evolution of brains, bodies, and things' (Malafouris & Renfrew, 2010, p.1).

To this list of brains, bodies, and things, I add 'knowledge products.' If the world were only experienced in the vacuum of real-time, then the three-part list above would suffice. However, as was the case for Benjamin's angel of history (Benjamin, Adams, & Prochazka, 2009), in the realm of formalized knowledge production—the realms of epistemology and practice, methodologies and texts—we tend to look from the present backwards, however contradictory that may seem given the apparently breathless progress of science and engineering in even the past twenty years. We breathe and eat and walk in the present, but we think with an eye towards the past: as in a social imaginary, the act of being in a present tense and in terms of social and cultural practices occurs in relation to a sense of purpose, a modus operandi. Such a purpose, or sense of 'actions making sense,' comes from our relationship to that which has come before but remains in the vestigial tails of daily life, infrastructure. In scholarship, the object of this eye's gaze is the set of knowledge products, the pads on the shoulders of giants, upon which our post-Enlightenment, mediated society is based. This past, mediated and generalizable, is the archive from which and through which statements are constructed, events are played out, knowledge is produced (Foucault, 1982). It is this archive in which we live and to which we live in relation.

This is not a deterministic statement. With each passing interpretation and re-assemblage of artifacts, knowledge products, contained in the archive, the possibility of emergence appears: the role of the subject—for some, the role of the reader (e.g., Eco, 1989, 1994)—gives rise to variance in interpretation of artifacts within the archive. Still, even given this room for emergence, 'We look at the present through a rearview mirror,' (McLuhan et al., 1996, p. 75) through the

constellation of subjects, objects, and the knowledge products contained in inscription, in prosthetic memory.

Shifting materialities—from voice to stone to paper-ish goods etched or mechanistic, to digital renderings (as in the case of Kittler's description of the shift from analog to digital)—implies transformations of information and knowledge products, but not fundamental disruptions in the communicative act of maintaining durable knowledge across time. (This knowledge-made-durable can be either formal or informal as per the definitions provided above.) We are simultaneously knowing what is now—the informal knowledge of how to exist in our daily worlds—and knowing what is known already through interaction with object that both carry and are born of formal knowledge. (One might use their smartphone to get directions via an app: this scenario includes the utilization of both formal and informal knowledge in that the smart phone could not exist without formal knowledge, but the use of the smart phone cannot be a manifestation of purely formal knowledge: if it were, it could not be naturalized. Each instance of use would be new, like learning to use it all over again.) If we are to stand on the shoulders of giants—to produce knowledge that is not only generalizable for the good of society such that it might trickle down into the realm of informal knowledge, but also in service to a greater ontological clarity—then knowledge production is as much a task of balance and proprioception as it is a task of formalized methodology and scholarly communication.

Certain aspects of knowledge are already implied in the three-item list provided by Malafouris and Renfrew; however, such knowledge as exists across time—formally derived through the application of one methodology, -ism, or another—escapes this list, or is perhaps distributed across the ambiguous mediation implied by 'things.' This absent or thinly spread knowledge is not wholly that of the mundane world or intelligence-in-action—not the informal

knowledge of how to navigate a crowded street, saw wood, reduce fret noise when playing a difficult passage on a guitar, or even the direct perception of whether or not a physical constellation in the environment is climb-able, swim-able, or throw-able. Rather it is the sort of knowledge that comes by way of what Bertrand Russell (1951a) called 'description'—a knowledge of phenomena in a generalizable sense that is itself mediated by semantic-laden inscriptions upon substrates such as paper, silicon, or film. The addition and overt consideration of this ontologically coy knowledge becomes all the more necessary as the invisibility of mediating objects spreads through old media to new.

This chapter section is a theoretical entry point into a discussion bridging discursive gaps between the experience of the world in the present tense, both through and with things—things in an ablative sense, or as mediations through which or by means of which actions are taken (Peters, 2015)—and the ways in which such things exert influence on the archive of knowledge, both formal and informal. If we are to begin to know how IoT will effect discursive transformations in the greater archive—and therefore transform the discourse of 'the human'—then we must, beforehand, enter into the activity of understanding how 'things' before the Internet impacted knowledge production in both formal and informal sense. The inscription of knowledge on a medium exerts influence over how knowledge products can be known across time—how the statements, 'I know now,' and, 'It is known,' relate in terms of knowledge by acquaintance and knowledge by description. Reading a paper is not the same as watching a film; watching a film is not the same as interacting with an app.

Given its grounding in the meeting space between subject and object, the thing is always at least a dyad, a coupling or set of couplings (however temporary). There is no thing without multiplicity and perspective, without the liminal spaces between categorical skins or membranes,

prototypical boundaries, and what Bowker and Star referred to as the human desire to classify (2000). Insofar as this requisite duality underlies the 'thingness' of things, things are inherently relational. In such unstable and fleeting relationality arising from subject and object couplings, "the word designates the concrete yet ambiguous within the everyday" (Brown, 2004, p. 5). This concreteness and ambiguity is not only central to the thing, but also allusive to a term of art that is conceptually adjacent to things: affordances.

We can better understand the relationship between being and knowledge production through the nature of things—their role in knowledge production both formal and informal—through the lens of affordances in this wider sense. As with any object in the environment, scholarly communications (i.e., conference papers) offer to actants within the environment sets of actionable possibilities, including abstract mental processes, which are mutually codetermined by the perceptual characteristics of such actants. Just as Blair (2010) and Gitelman (2014) demonstrated the impact of mediation on the production of knowledge—how the material form of curios, cabinets, even documents themselves, containing knowledge bearing inscriptions impacts how those inscriptions shape and give rise to durable knowledge—I argue that the mediation of inscription impacts which forms of knowledge production and which modes of cognition can be represented.

The term was coined by ecological psychologist James Gibson: "The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill" (Gibson, 1977, p. 127). That such a relatively simple statement should receive concentrated and virtuosic scrutiny from scholars in the fields of cognitive science, design, and human-computer interaction (HCI) seems at first somewhat odd. However, the root of such attention is found within the same piece written by Gibson only a couple pages later: "… an affordance is neither an

objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of the subjective-objective and helps us understand its inadequacy" (Gibson, 1977, p. 129).

Little in the realm of communication and media studies, cognitive science and HCI is more difficult to do than to think outside of Cartesian subject-object dichotomies. As a result of this difficulty, as Kaptelenin and Nardi noted, "the meaning of 'affordance' in HCI remains vague" (Kaptelinin & Nardi, 2012, p. 967). Add to the proverbial pot the notion that 'affordances' call into question the validity of theories of direct and indirect perception, and what's created is a bitter stew. Such a stew is frequently watered down in such a way as to render affordances mere properties of objects, or left off the table altogether. Taking a cue from Chemero (2003), I propose that such questions of direct or indirect perception be set aside for the moment in order to make progress towards understanding the nature of the relationship between subject and inscription-bearing object in the maintenance of the archive of formal knowledge production. Rather than perception, I focus on the collocation of affordances in the thing, in the coupling of a subject and an object.

Given the role of the subject in its construction, the thing appears to be always known through acquaintance, the meeting of two entities by way of overlap in perceptual fields. This is the thing as set of affordances: possibilities for action mutually co-constructed between subject and object. The concept 'thing,' however, remains one generally defined through description, the transference of previous constructions of a 'thing' to potential constructions, from a steady subject projected to myriad objects. It is at this point of description at which one arrives at the 'object' or 'category' of which Malafouris and Renfrew wrote. In the scholarly discourse on things, the thing is always a thing, but rarely if ever this one or that one. Indefinite articles abound. In an attempt to

remedy this problem of generics for the sake of my argument, I direct your attention to this thing, the thing that you are reading at the present moment—the relationship between you and this document—and request that you bear this relationship in mind.

To understand what might be known by means of inscribed information—such as that which emerges from the data-extractive practices of IoT-enabled objects—it is necessary to focus not only on what is said or inscribed, but also on the forms of mediation that render inscription readable. We must look to the relationships that arise between subjects (readers) and objects (the inscribed), to the actionable possibilities constituting the thing if we are to understand the role of affordances in giant step between cognition and the maintenance of the archive of scholarly knowledge.

Although the knowledge product has its roots in (ostensibly direct) observation, the actual product resides on or in the substrate that carries it—spreadsheets, documents, databases, repositories, prosthetic memory. This form of knowledge is in line with the cognitivist paradigm, which separates the mind from the body as much as it does the semantic content of inscription from the substrate that carries it: if we think and therefore are, then it is inscribed and therefore known. The latter temporal category of knowledge constitutes something closer to the phenomenological: knowledge of the world, the import of the ephemeral and mundane. This is the knowledge residing in the act of being in the world, rather than conceptual understanding of what the world is and how one might be in it. This is the knowledge of proprioception, of wayfaring (Ingold, 2007), of olfaction's linkage with memory (Doop, Mohr, Folley, Brewer, & Park, 2006).

Ultimately, however, both temporalities are inextricably linked with the objects that embody them—the materialities and mediations that give rise to knowledge in the moment and knowledge across time. If the former category of knowledge resembles Russell's knowledge by

description, then surely the latter form occurring in the present tense approaches Russell's knowledge by acquaintance. However, as the production of present tense knowledge, of intelligence-in-action, is increasingly mediated—whether fed through spreadsheets, documents, databases, repositories, etc., and subjected to (often) computerized analysis—the clear separation of description and acquaintance comes into question. To what extent is acquaintance achieved with anything other than the mediating substrate that carries a knowledge product?

Just as the adoption and proliferation of IoT technologies is incremental, so too is the erasure of modes of being—of knowledge by acquaintance—by way of the adoption of IoT technologies. This incremental erasure of direct acquaintance will be achieved slowly. But I do not mean to say that the human will no longer experience the world through their built-in modes of sensation and perception. But each of these experiences will be mediated: the human will know the world through acquaintance with objects that define the world through description. If the roots of this transformation were set down at the dawn of the Gutenberg galaxy, then they are solidified at the dawn of the prosthetic galaxy. Humans are extending themselves in such a way that the world can be known through prostheses: but the knowledge of this world, too, must then be prosthetic. The prosthetic, as we will see in years to come, will lose its indexicality. It will no longer be prosthetic, but will exist as an unmarked category. It will be naturalized.

7.5.6 Speculative Deduction: Between Technical Images

If we can functionally divide the world of 'things' into two categories (the symbolic and the real), then when we encounter 'things' in the Internet of Things, something unexpected happens: through the inclusion of additional subjects that constellate around an object to construct a 'thing'

in IoT, a sort of quantum state is achieved wherein the subject-user of a device is not only engaged in the production of a 'real thing,' but is also engaged in the construction of a symbolic thing. The cat is both in the box and not in the box.

That the subject-user couples with an object to constitute a real thing is obvious: the subject engages with an object in a way defined by the actionable qualities that arise between the two (i.e., the affordances), and the 'thing' becomes real because the reason for its coming into being in the first place is to effect an action: I put on my FitBit to count my steps. The 'thing' is real.

That a subject, in coupling with an object to constitute a real thing, also simultaneously constitutes a symbolic thing becomes apparent when considering the actor-network that gives rise to the maintenance, design, production, etc., of the object. Take, again, the example of the FitBit. The FitBit-as-object is not only coupled with me, the subject-user. It is simultaneously coupled with *n* devices (i.e., other objects), but also with *i* subjects. These subjects take the form not only of the designers responsible for the usability of the device, the programmers and administrators who keep the back end of the FitBit apparatus running, but also the increasingly subjectified corporate entity that is 'FitBit.' (Moreover, and along similar lines of paradoxical—even ironic—subjectification, any algorithms that might 'learn' how to interpret data that is collected by the FitBit device(s).)

But let's take a moment to examine the irony of this quantum state of chimeric subject-objectivity. In transferring subjective qualities to objects, subjectivity is removed from the user: in coupling with an object for the purpose of use, the user becomes a symbolic thing through the very process of being a real thing. Unless one is willing to assume that power can be evenly distributed (i.e., that a political homeostasis, a sort of milquetoast saline state can ever be achieved and maintained), one must assume that subjectivity is a competitive resource. The extent of

subjectivity—perhaps subjective efficacy—arises from the power one has to interact with an object; the extent to which the affordances arising between subject and object empower that subject to act in the world. In a situation where in a corporate actor—and I use that term here as a stand-in for the vast network of heterogeneous assemblages of people and technologies that undergird the functionality of the FitBit as an IoT-enabled device—dictates the functionality of the FitBit device, that actor has a far greater set of potential actions to choose from given the relationship between them and the FitBit than does the individual user. (The individual user can wear it or not; if the former, then they can interact with the object and the data it gathers to various extents.) But the corporate subject can do so much more: it has access to not only a given individual's data, but the aggregate. It can nudge and guide the subject-user's action through reprogramming, repackaging, re-marketing. Ten thousand steps could become twenty, thirty. The power is not found in the subject-user, but in the subject-corporation precisely because the subject-user (even though they comprise a real-thing in the world) exists as a symbolic-thing from the vantage of the corporate subjectivity.

What we are left with, in one scenario, is an archive wherein the individual human—the subject-user—is no longer an archon, but rather a *fond*. In this scenario, the archive will have transformed fully and completely into a container for the human: in a truly Foucauldian sense, only that which is catalogued in the archive becomes possible, up to and including the very act of being human. But this act of being human is a terrifying one: one where not a clinical gaze, but a symbolic-objectifying gaze, a god-trick from the machine, renders the human user distinctly unreal.

7.5.7 Speculative Deduction: The (Post)Human and Archival Breakage

The future of the human in IoT—the latent and as-yet unrealized meanings of the statement, 'I am human'—is a matter of concern. Up to this point, I have presented views of the human from both sides of the humanist/technodeterminist dialectic. I have not taken this approach to confound or to frustrate, but rather to trouble: to trouble our contemporary, objectivist-tinted fixation on the idea that only one answer can be provided to any given question. To further elucidate, I provide a quote from Vilém Flusser's work, 'On Doubt,' which lays the groundwork for the consideration of multiple, simultaneous and contradictory archives, each of which describe and bound overlapping aspects of the human experience—the experience of being in a cognizing way derived from the embodied, biological infrastructure of sensation and perception:

> To wish escape from the structure of the reality of subject, object, and predicate, is to wish a fall into metaphysical suicide […]. A reality that consists only of subjects (Parmenidean madness), or objects (Platonic madness), or predicates (Heraclitean madness), is an example of this type of suicidal escape. As uncomfortable as it may be, we must accept the triple ontology as a given, imposed by language. (Flusser, 2015b, p. 40-41).

In being predicated on data extraction, IoT flattens the world. That is, it flattens not only ontology, but also epistemology. Using the framework provided by Flusser, it leans towards an object-oriented madness, assuming that both subjective and predicative modes of being can be understood through an objective lens. Where data is created, analysis is assumed; where computer-generated data is created, quantification is assumed. Quantitative analysis implies objectification: thus we arrive at a potential future wherein Platonic madness is normalized, where the epistemic-pathological desire to de-naturalize a pre-linguistic world of direct experience through the objective, linguistic, and image-based creation of a nature (e.g., an object to be understood *as an*

object rather than a phenomenon or set of phenomena) re-creates a humanity that is neither humanistic nor post-humanistic, but is rather posthumanistic only through the lens of humanism. The human becomes the object of itself: an object that is constructed as a de-naturalized version of its subjective referent; a phenomenon that is defined only through the reductionist, data-driven creation of an artificial noumenon.

We will arrive at the point of objects not as pure objects, but as subjects filtered through an objectivizing lens. To utter the statement, 'I am human,' will be to signify enrollment in and archontic power over a new, schizophrenic archive wherein at least three, parallel phenomenologies are present: that of the experience of the human; the experience of the computer (for what else might we call the type of sensation and perception that results from the networking of sensor-imbued objects than experience?); and the experience of the human *in terms of* computational phenomenology: the experience of *the user*.

Each of these phenomenological modes provides a suitable foundation for knowledge production. We know the world through our bodies; computers know the world through sensors and actuators and algorithms; we know ourselves through the computerized world. As embodied agent, the human remains; but in remaining, becomes obfuscated like the initial lines in a palimpsestic work. We will remain human even as we strive to interpret ourselves—for reasons of commerce, pride, curiosity—as somehow more than human or posthuman. Through our own giddy technological development—one that falsely presents as a techno-deterministic future—we will reach a new level of freedom: one wherein we are free to choose from a buffet of ontological pathologies each of which will no longer present as pathological, but as normal; to deny ourselves the ethical and historical responsibilities of the human through the creation of ourselves as computerized humans, as late insertions into the computerized ontology of the world born of

sensorial networks; to pick and choose which phenomenology we will use to ground ourselves in this situation or that situation freed from the responsibility of our actions by algorithmic analysis.

From this freedom emerges the fracture of the archive: the shattering of the solid archive, heretofore born only of human embodiment and its relationship to language, image, and inscription. Such a shattering can only be described as an historiographical schizophrenia. We are multiply human; we are multiply archival. The historical *a priori* condition to which IoT will give rise through the violence of its own phenomenology will be one that contains new archival subsets: a new primitive archive within an historical *a priori* condition, which itself contains three archival configurations: the subjective, the objective, and the predicative. In being each of these—subject, object, predicate—the human divorces itself from factuality. It is not this or that, but all; the human becomes a matter of concern that can be reduced to one ontological mode or another, but *should not* be reduced.

We arrive, then, at a new humanism: a humanism that strives to remember the human across each of the fractured states of the schizophrenic archive: a humanism that seeks a return to itself before itself: a humanism that seeks its own history in the narcissistic reflection of a pond knowing full-well that the mirrored pond that birthed it and destroyed its predecessor cannot be drained. This is a humanism of reflections and memory, a humanism of speculation and loss. This is a new humanism in which the human must strive to be human again, and in so striving has the opportunity to recreate itself as ethical.

The means by which one—a human living in the subjective mode—has the chance to effect ethical action, however, remain in question. One critique of the work that I have presented is that it overlooks our current Anthropocentric condition: climate change is real; the sustainability of our species is in question. And yet the existence of this condition—immanent demise—provides

anecdotal evidence for the likelihood of the emergence of a new humanist ethics. If we are to emerge from this global disaster, we will do so through the exercise of ethical restraint: we will reorganize; develop better infrastructures; devise better governments; practice better living with less blind reliance on the pride of our thumbs and prefrontal cortices. If that battle can be won—and I certainly have my doubts—then so, too, can the emergence of a new ethics be effected.

7.5.8 One Last Speculative Deduction: Assemblages that Forget

In Chapter Two, I noted that the concept of the fluid assemblage was more or less appropriate as a means for describing certain objects within the imaginary of the Internet of Things. Its primary shortcoming was that it did not account for the role of the subject in the composition of the thing. That is, the 'thing' was seen primarily as a constellation or assemblage of objects that exist in relation to a subject, but a subject that remains largely unchanged.

In the otherwise fascinating operationalization provided by Redström and Wiltse, It was as though the fluid assemblage exists as a variable in relation to a constant subject. The fluidity of the assembage begins and ends with the objects that are assembled, but does not extend to the subject that assembles them. The subject, in being a constant, remains unchanged in relation to the fluid assemblage. When approached in terms of the concept of emergence in systems theory (Meadows, 2008) and wicked problems (Buchanan, 1992) from design theory—there is even room for the watered down version of affordances proposed by Don Norman here (Norman, 2013)—however, it becomes apparent that constellations of objects must, at least in-part, be considered in terms of their influence over subjects, over users.

If things are ablative—if we live through them and by means of them—then things are active in defining the subject. They are active in a way that is greater than the extent to which they

'configure the user' (Woolgar, 1990). When a set of assemblages, or perhaps a style of assemblage, becomes standardized, it moves into the realm of possible naturalization. Naturalization occurs—not unlike the process of acclimation in the psychology of sensation and perception—when the foreground of potential infrastructure recedes to the background: when it becomes truly infrastructural. In this scenario, when IoT-enabled devices become as sidewalks, streets, plumbing, walls, then they form the discursive boundaries of what can and cannot (reasonably) be said or done — discourses, for Foucault, also include actions and events. When IoT-enabled objects bound what can be done or said, they not only configure the user, but they act in a stronger way than that: they shape the world in which the user is configured. In this line of logic, then, to claim that the objects implicated in the formation of fluid assemblages are the only actants that undergo change in the production of the thing is to not go far enough. Things are people, too—at least in part.

We are thus, in terms of an archive derived from and constituted by the extracted data, the possible statements and actions related to IoT-enabled devices, left with the task of tracing the trajectories of two moving targets: the object and the subject.[150] These moving parts, put simply, are the very objects and subjects that constitute the thing.

Consider, for example, the absence of the USB symbol from the FitBit Zip dongle described in Chapter Six. When first described, I assured the reader that consideration of such a small absence was not pedantic. Here I demonstrate why that is the case.

The absence of the USB symbol indicates an infrastructuralization: while USB technology had already risen or receded to the point of infrastructure by the time the FitBit Zip was released, its symbol, the Trident, acted as the term 'digital' acted at the rise of the digital library. Digital

[150] As I have argued throughout the course of this work, the categories of 'subject' and 'object' are no longer mutually exclusive in terms of IoT. But, for the sake of clarity, I will continue to use them here. I ask the reader to think of them as ontological categories with degrees of freedom—or perhaps categories that exist along a spectrum that stretches from the purely subjective to the purely objective.

technologies were already infrastructural at that point in time, but the presence of the modifier 'digital' signified a newness, a contemporary quality that situated users of digital libraries in a future-present tense. As we have seen, though, the 'digital' modifier has fallen off of libraries. Libraries are now simply expected to have digital components.

The same can be said of disappearance of the USB symbol. The sort of connectivity that is signaled by the trident symbol is now, quite simply, taken for granted. What this means for the current argument is that the IoT-enabled devices that populate our contemporary imaginary or imaginaries of the future(s) are becoming infrastructural. They are receding, becoming the ground to our living figures. In becoming the ground, in receding, they become obfuscated: not intentionally obfuscated, but forgotten or overlooked. We build upon them as though they do not exist, as though they are constants that do not require over attention. In short, they become latent variables active in the production of daily life: and this latent quality—not dissimilar to the effects of forgetting—means that they are not actively accounted for. They disappear even as they become ubiquitous. They disappear in ubiquity.

Such disappearance signals the structural security, the durability, of a potentially new set of discourses. When part of an assemblage—particularly when that assemblage recedes to the level of infrastructure—goes invisible, then it is taken for granted. It becomes an integral part of the equation that defines what we can and cannot reasonably do during the course of our daily lives and in relation to the phenomenal worlds in which we find ourselves—those subject-based, lived facets of the human *umwelt* from which my personality, my history emerges as separate from yours. In this light, discourses derived from that infrastructuralization—the discursive durability of USB-connectivity-as-discourse and the greater discursive set of ubiquitous connectivity to which USB connectivity belongs—become more durable themselves. In being predicated upon a discourse that

has achieved the status of infrastructure, discourses directly related to the extractive and objectifying nature of IoT themselves rise/recede closer to the level of infrastructure themselves. That is, they become standard, naturalized, and tacitized ways in which the world is known. They become granted, given. They become, in essence, archival.

But as we have seen through the disappearance of the USB symbol, in becoming archival, they also potentially become forgotten. In forgetting, we are not forgetting the technology itself, but rather the newness of the technology. In forgetting that newness, we forget the previous worlds—the previous sets of historical *a priori* conditions—against which USB technology stood out as novel. We concretize as humans (as subject-object chimeras) that can live nowhere else and under no other conditions than those that arise from the archive of IoT—an archive that is created through the oblivion of amnesia.

This state of amnesiac memory, in which futures are written as new lines upon a palimpsest, constitutes loamy land in which to plant speculative deductions. If we take the Foucauldian and Derridean characteristics of the archive as described earlier in this chapter as rules, then we can engage in the process of deduction based upon these rules. In combination with such notions as discursive change, archontic control, violence (both jussive and sequential), and spectrality, we can begin to consider what ubiquitous connectivity, extraction, prosthetic sensing, and the dissolution of the membrane separating the subject from the object might mean for the future of the archive.

From one vantage, it means exactly this: an archive in which the human of The Enlightenment, the liberal human, the human as rich subjective actors, is only a ghost. As the fluid assemblages of objects that partially comprise things in IoT become infrastructure, they take with them into the realm of invisibility previous notions of the human. They render invisible that which we once were

and replace our former selves with the newness of the objectively understood, the objectively defined human. We become our data; mirrored images seen through the lens of the technical image, as though that technical image were a funhouse mirror.

As Derrida wrote: '*L'Un se garde de l'autre pour se faire la violence*.' The One protects itself from the other so as to do violence to itself. The archive, in this light, is violent. Its primary mechanism is one of violence: to be re-membered is to not be forgotten. But the one (memory) cannot exist without the other (forgetting). Therefore, to remember is as violent an act as to forget. Possibilities is forgotten through the generative act of remembering; they are forgotten so as to constitute a present tense bound inextricably to momentary emergences of pasts and futures.

I opened this dissertation with a meditation on the red thread. I said that an archive is irreducible to anything but itself. This remains true. We can never know the archive, we can experience it and know our experiences. We can say that the archive exists. We can deduce its existence because of our own existence. We can situate the production of historical knowledge—and all knowledge is historical—in the documental archive, itself an extension-turned-prosthesis of the human archive. But we cannot know it beyond ourselves, the technical images we chase through the looking glass of graphical user interfaces and algorithmic guidance. We narrate and narrativize—tell the stories of our lives as archival stacks, *les fonds des archives*—as an act of anamnesis that reminds us always already through the flow of our days of the spectrality of the forgetting *in order to* narrativize, *in order* to remember: vast sets of possible futures, possible pasts spindling off from every moment of experience we reduce through objectification. We narrativize ourselves as objects, as points from which data are extracted and which become the data extracted. We forget ourselves in the description that allows us to know ourselves.

What I see when I look through the glass darkly—through the screen of my phone, my computer, my television, my dashboard, the creeping tint of my windows and rearview mirror—is this: a blissful oblivion, an ecstasy of technical images. And we march into it, design our way past its threshold into a light that exists at the whim of a darkness, a cyclical forgetting that remembers only itself. Amnesia, an imaginary of memorials and modalities, emergence and degradation at the tip of the arrow of time. We become the objects of ourselves, acquainted only with description.

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