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## **Speculative Design in HCI: From Corporate Imaginations to Critical Orientations**

**Richmond Y. Wong, Vera Khovanskaya**

**Abstract** In this chapter we analyze the rhetorical work of speculative design methods to advance third wave agendas in HCI. We contrast the history of speculative design that is often cited in HCI papers from the mid 2000s onward that frames speculative design as a critical methodological intervention in HCI, linked to radical art practice and critical theory, with the history of how speculative design was introduced to HCI publications through corporate design research initiatives from the RED group at Xerox PARC. Our argument is that third wave, critically oriented, speculative design “works” in HCI because it is highly compatible with other forms of conventional corporate speculation (e.g. concept videos and scenario planning). This reading of speculative design re-centers the “criticality” from the method itself to its ability to advance agendas that challenge dominant practices in technology design. We will look at how practitioners trade on the rhetorical ambiguity of future oriented design practices to introduce these ideas in contexts where they may not otherwise have much purchase. Our chapter concludes with a call for critically oriented practitioners in this space to share their experiences navigating speculative design ambiguity and to document the disciplinary history of the method’s development.

### **10.1 Introduction**

Speculative design, along with related practices such as critical design and design fiction, have grown in prominence in HCI since the early 2000s. Initially developed as a practice for divining “new genres” of technology use, speculative design has

come to describe critically oriented research practices that create artifacts, representations, or depictions of possible and often alternate futures, removed from immediate practical concerns of implementation and commercial viability. Speculative design in HCI takes on several forms ranging from design proposals to built artifacts, which are used to imagine alternate sociotechnical configurations of the world as a way to interrogate questions about values and politics through design.

During the first two decades of the 2000's, third wave lenses have spread in HCI more broadly, critically and reflexively interrogating the relationships between humans, institutions, and technologies; highlighting the ongoing (co)construction of knowledge, expression of values and politics in sociotechnical systems; and reflexively recognizing the situated positionality of researchers and designers. Speculative design provides one useful way to meet the methodological challenge presented by HCI's "critical turn" toward matters of concern beyond the conventional workplace, explicitly engaging with the values and politics entangled in situated activities.

While speculative design's lineage is generally tied to a series of critical practices from art practice, the humanities, and social sciences, our goal in this chapter is to situate—and in some cases, reconnect—speculative design as commonly discussed within HCI with a history of speculative design as a corporate project. We do this by highlighting a broader set of speculative, future-oriented, and imaginative practices that may not immediately strike the eye as critical or reflexive. By tracing these practices, we argue that the uptake of a critically-oriented speculative design in HCI is both a testament to the disciplinary blending that is third wave HCI, and we identify new opportunities for speculative design going forward.

Third wave HCI, as articulated by Harrison, Tatar, and Sengers, is distinguished by reframing "interaction": from seeing the human mind and computer as symmetric coupled information processors to be optimized; to viewing interactions as situated, meaning being constructed in the moment, and foregrounding values and politics (beyond those of efficiency). This was also coupled with the spread of computing beyond the workplace into home, leisure, and other spheres of life, and beyond the desktop into mobile, physical, and other devices. These shifts emphasize the roles of understanding context (Dourish 2004; Harrison et al. 2007). With these shifts in viewing "interaction" and shifts in computing practices, a range of new methods and epistemological stances were brought into HCI, including ethnography, practice-based research, critical theory, and other stances that reflexively recognize the role of the researcher in acting in the world and creating knowledge, and view systems as sociotechnical, situated within particular contexts. Speculative design provides one way to investigate and address third wave concerns.

In this chapter, we first briefly discuss speculative design's growth in HCI by tracing trajectories of critical practices from art, the humanities, and social sciences. Because it is commonly defined against design that addresses practical and immediate concerns, speculative design is generally seen as outside of commercial interests. However, looking to the history of speculative design's uptake in HCI, we also situate speculative design within a trajectory of industry-situated technology prac-

tices. We discuss the role speculative design plays in corporate research and development contexts and argue what while speculative design may seem like an impractical, “out there” and “critical” practice, the tactic actually leverages conventional forms in product development. This reading of speculative design re-centers the “criticality” from the method itself to its ability to advance agendas that challenge dominant practices in technology design. We will look at how practitioners trade on the rhetorical ambiguity of product design to introduce these ideas in contexts where they may not otherwise have much purchase. Rather than viewing the emergence of critically-oriented speculative design in HCI as (directly) indicative of a third wave approach, third wave HCI instead provides a lens to understand the reorientation of existing future-oriented, speculative design-like practices toward a new set of explicitly social and political concerns.

## 10.2 Speculative Design as Critical Practice

There are several origin stories to Speculative Design’s flourishing in HCI as a critical practice. Perhaps the most commonly told history traces speculative design through Tony Dunne and Fiona Raby, designers and researchers, who termed “critical design” in the late 1990’s (Dunne 1999; Dunne and Raby 2001). In their original discussion of critical design, “critical” means a type of dialectic that uses the practice of design to lead to reflective discussion and debate on dominant cultural values; Dunne and Raby contrast critical design with “affirmative design”, which supports the status quo or dominant worldviews (Dunne and Raby 2001). They predominantly discuss capitalism as a worldview they are critiquing and reflecting upon, noting that the type of design they are promoting would not be able to exist within the marketplace. Malpass discusses critical design through Dunne’s concept of ‘post-optimal’: a move away from using design for efficiency and optimization (Malpass 2016). Critical design works through an ambiguity of ‘para-functionality’—where design artifacts make use of design conventions to seemingly be able to function or be utilized as a ‘normal’ product, while simultaneously seeming out of place, unusual, or unfamiliar, allowing “what was invisible and lost in the familiarity of the everyday” to be “made visible” (Malpass 2016).

While critical design artifacts use para-functionality to seem like everyday designed objects, Dunne and Raby write that critical design creates a space for these design practices to exist outside of commercial design processes, writing “Design proposals like these can really only exist outside the marketplace, as a form of ‘conceptual design’ – meaning not the conceptual stage of a design project, but a design proposal intended to challenge preconceptions about how electronics shape our lives.” (Dunne and Raby 2001) Dunne and Raby suggest that this practice might be more amenable in academic settings, or would require structural and organizational changes in the design profession. Nevertheless, Dunne and Raby’s practice of critical design is instigated by a critically-minded designer who creates an artifact that leads to discussion and debate among designers and the public.

In the early 2000s and 2010s, Dunne and Raby shifted their terminology from “critical design” to the term “Speculative Design,” in part to frame their work as a generative practice, writing that their interest is “in using design to open up all sorts of possibilities that can be discussed, debated, and used to collectively define a preferable future for a given group of people.” (Dunne and Raby 2013). Like critical design, Dunne and Raby discuss speculative design as a practice that uses design artifacts to open up and explore alternate possible and plausible futures as a way of generating discussion about what a preferable future might look like. They also discuss speculative design as a practice outside of commercial design processes, writing that “once designers step away from industrial production and the marketplace we enter the realm of the unreal, the fictional, or what we prefer to think of as conceptual design—design about ideas.” (Dunne and Raby 2013) While others refer to these practices collectively as “speculative and critical design”, in this chapter, we use the term “Speculative Design” to refer collectively to both speculative and critical design.

In HCI, Speculative Design takes on several forms, including built artifacts, media experiences and artifacts, design proposals, and written design fictions, used to imagine alternate sociotechnical configurations of the world. To illustrate this range, we detail two examples of Speculative Design projects, one using a deployed conceptual design proposal and one using a built artifact. In 2014 at the annual CHI (Computer Human Interaction) conference, a series of signs appeared in restrooms describing a project called *Quantified Toilets*, a public infrastructure project to better understand the activities of people in buildings, in which data collected from toilets could provide information about a person’s sex, blood alcohol content, drug use, and other medical information. This information was also publicly streamed through a data feed on a website (Dalton et al. 2014). The project by Dalton et al., did not actually collect users’ data, but rather presented simulated data in an effort to provoke conversations about surveillance, public design, ethics, and consent. While this project emerged from a workshop on critical making (Tanenbaum et al. 2014), the artifacts created can be seen as examples of speculative design. It imagines a future world through a series of proposals—the signs placed in the restrooms and the website—in an effort to generate critical and reflective discussion. While this project imagines a future in which quantified toilets exist, its focus is not about *predicting* the future. That is, its goal is not to simulate a world with quantified toilets and ask “how accurate is this experience to a future in which quantified toilets exist.” Instead, its motivating questions are around “what values and politics are implicated in a design and deployment like *Quantified Toilets*?” or “What types of provocations and reflections can this design help generate?” Speculative design, while often future-oriented, is not about predicting the future. Instead, speculative design serves to ask questions about the politics and values in sociotechnical configurations that we currently experience (or might want to experience in the future) by creating an imagined world configured differently than ours. It is speculative in that it re-imagines the world to be organized into different social, political, economic, and technological configurations, or what Auger terms “alternative pre-

sents” (Auger 2013). Furthermore, *Quantified Toilets* highlights new types of questions for HCI to ask and grapple with as computing moves out of the traditional workplace; the actors and groups of people implicated goes beyond traditional categories of “worker” and “boss” and the goals of evaluating this system expand beyond “efficiency” or “worker-optimization.” Instead, *Quantified Toilets* highlights questions related to the realms of civics and public health.

In another example, Devendorf’s *Redeform* (or “Being the Machine”) is an alternative system for digital fabrication that gives a human the directions usually given to a 3D printer, allowing the human to interpret and execute the process of making using everyday materials (Devendorf and Ryokai 2015; Devendorf 2016). This system was built as a functional artifact that allows the human to engage in printing, consisting of an actuated laser pointer controlled by software that shows the human where to add new material. The built artifact is used to interrogate and critique a discourse that presents “making” as limited to specific (often male dominated) “maker spaces” and portrays “making” as a practice that highlights a one-way relationship between humans and materials (i.e. humans create fabrication instructions and upload them to a machine, which creates the object). *Redeform* reframes “making” as a practice that can happen in a multitude of situated environments, and highlights an alternative co-constructive relationship between humans and materials.

In HCI, researchers also trace Speculative Design through a range of other traditions from art and the humanities. While Dunne and Raby used the term “critical,” they do not explicitly engage with critical theory as articulated by Adorno, Benjamin, and others in the Frankfurt School. Jeffrey and Shaowen Bardzell have written a series of articles connecting Speculative Design’s insights that design can both perpetuate harmful ideologies and be a form of resistance to the history of critical theory, tracing critical theory from the philosophy of Marx and Nietzsche through the Frankfurt School to a broadening of critical theories in the 1950s and 1960s including semiotics, poststructuralism, feminism, and psychoanalysis (Bardzell and Bardzell 2013, 2015). Gaver and Martin used the term “speculative design” to discuss their practice of creating design workbooks, a set of conceptual design proposals that help open and explore a design space of possibilities (Gaver and Martin 2000). Pierce et al. link current Speculative Design practices to 20<sup>th</sup> century avant-garde approaches including Data, Situationism, and tactical media, and to activist design approaches (Pierce et al. 2015). DiSalvo et al. and Elsdén et al. bring in connections to mid-20<sup>th</sup> century design and architecture groups Archigram and SuperStudio (DiSalvo et al. 2016; Elsdén et al. 2017). Elsdén et al. also discuss the Japanese art of chindogu, of creating humorous and nonsensical practical tools and everyday gadgets as a predecessor to Speculative Design (Elsdén et al. 2017). HCI researchers have also cited histories of speculative design from fields beyond art and design, including urban planning’s histories of imagining cities, the future of governments, and life in the public sphere (DiSalvo et al. 2016); In this volume, Fox expands the range of philosophical lenses in speculative design, using the philosophy of Gilbert Simondon to analyze speculative design. Others have cited practices from literature as precursors to speculative design, including practices of literary criticism as a way to articulate practices of critique that speculative design

engages in (Bardzell and Bardzell 2013), and linking practices of science fiction with practices of critical reasoning. Wakkary et al. write that “the practices of science fiction bring to design research the reasoning on multiple futures that challenge assumptions and the sociological, cultural, and political tendencies that underlies our representations and considerations of design and technology” (Wakkary et al. 2015).

### 10.3 Moving Toward Third Wave Concerns

In HCI research, the early 2000’s marked a critical turn to “third wave” HCI, recognizing knowledge as situated and socially constructed; foregrounding and contesting values and politics embedded in and associated with design; and embracing the use of interpretive research methods (Harrison et al. 2007). Speculative design was one such method of inquiry that supporters of this research agenda adopted. The common story of speculative design is that the practice of imagining alternate sociotechnical futures removed from commercial constraints, seeing the future as multiple and uncertain, and not immediately focusing user needs, are what makes it a third wave approach.

With the development of “third wave” HCI came renewed and explicit focus on values in design (Harrison et al. 2007) and the “marginal user” (Bardzell 2010). The turn also signaled an opportunity for methodological innovation as new avenues of inquiry for the field “in experience, emancipation, domestic life, intimacy, sustainability, and the good life” (Bardzell and Bardzell 2015). Because computing had moved out of the traditional workplace context and outside the sphere of simple efficiency optimization, these new third wave concerns were mismatched to HCI’s dominant method and evaluation paradigms. For example, Bardzell and Bardzell’s work on digitally mediated sex toys examines the import of HCI design methodologies for evaluating sex toys. The study of digitally enabled pleasure thwarts easy quantification and makes clear that traditional evaluation in terms of “efficiency” along a narrow metric (evaluation in crude terms i.e. Likert scales) risks reifying patriarchal and normative understandings of sexual pleasure. Because the nature of this experience varies between subjects in ways that carry political significance, the case of the sex toys pushes HCI practitioners to be (as sex toy designers already are) responsive to aspects of embodied and situated experience and social activist oriented design (Bardzell and Bardzell 2011).

A range of new practices were emerging to try to address these issues, often framed as critical methodological interventions against dominant HCI practices which were mismatched to explore these questions. For instance, Dunne and Gaver’s project *The Pillow*, which presents a plastic inflatable pillow with an LCD screen displaying colored patterns reflecting ambient electromagnetic signals (Dunne and Gaver 1997), can be seen as a forerunner to Speculative Design, contributing the idea design practice can be used for cultural inquiry rather than usability and efficiency. While appearing similar to a product prototype, they pose the

project as a “cultural thought experiment” to probe at what types of electronic technologies we value as practical or useful. Dunne and Gaver explicitly frame this project against dominant HCI practices of user centered design, writing “The aim is not to assess the design’s usability, of course, nor the degree to which it fills recognised needs. Instead, the purpose is to trigger people’s imaginations, to challenge them to consider how this sort of technology might fit into their lives.” (Dunne and Gaver 1997). The later uptake of Speculative Design methods, which echo older product design techniques while explicitly raising questions about embedded values is an example of a methodological maneuver to meet the challenges of the third wave. For HCI practitioners, speculative design was one way to fill the methodological grey space that opened up when new third wave concerns were introduced.

In this common story, Speculative Design reflects a shift toward third wave HCI by calling attention to the ways that critical practices from other disciplinary fields, including design and the humanities, have been adopted by HCI researchers and integrated into their disciplinary practices to explore questions beyond the immediate concerns of product development (while still invoking notions of traditional product design through para-functionality of Speculative Design artifacts). In this sense, speculative design itself can be viewed as a critical methodological intervention into HCI – the introduction of a method or approach that was more forward-looking and expansive beyond studying the cognitive behaviors and interactions between a single user and an interface. However, this framing of Speculative Design as a critical intervention in the field of HCI raises the question of what continuities Speculative Design might have with existing HCI practices, rather than viewing Speculative Design as a new novel practice. We turn to a different history of Speculative Design’s adoption in HCI, based in corporate design and HCI practices.

Some HCI researchers have conducted overviews of the ranges of speculative, future-oriented, and fictional work done in HCI (Mankoff et al. 2013). For instance, Blythe writes that “Design is a fundamentally imaginative act that involves picturing the world other than it is. Many forms of design (e.g. scenarios, personas, sketches, speculative design and design fictions) can be thought of as research fictions” (Blythe 2017). Bell and Dourish discuss the role of a shared future vision in shaping the research practices of ubiquitous computing (Bell and Dourish 2007). Much in the same way Speculative Design utilizes the ambiguity of para-functionality to allow conceptual design artifacts to be seemingly situated in everyday life; Speculative Design often utilizes the ambiguity of the meaning of “speculative” to be situated in both critically-oriented and more generally future-oriented contexts and practices. Thus in the remainder of the paper, we use “speculative”, “speculation,” and “speculative design” (in lower case) to refer to general future-oriented and imaginative practices focusing beyond immediate practical concerns. We use “Speculative Design” (in upper case) or “critically-oriented Speculative Design” to refer specifically to a critically-oriented set of practices.

## 10.4 Speculative Design as Corporate Practice

While the previous section provided the common narrative about the origins of Speculative Design in HCI, we trace an alternate origin of Speculative Design Methods as part of the research and development arm of the technology corporation. Our argument is that speculative design, as a future-oriented and imaginative practice, was established as a method before any explicitly “third wave” concerns began to make headway in the field. If we look to the archives for the Association of Computing Machinery Digital Library (ACM-DL), the first ACM conference paper to introduce “speculative design” as a keyword in the is a paper from the Research on Experimental Document (RED) Group published at CHI in 2000. This paper describes the group from Xerox PARC and their exhibit on the future of reading of at The Technology Museum of Innovation in San Jose (Balsamo et al. 2000). The group was formed in 1997 and its goal was the following:

“...to create and study new genres focusing on opportunities offered by emerging media and technologies. Trained in such fields as architecture, computer science, engineering, product design, critical theory and theater, the eight members of this group had diverse experiences with a range of research philosophies and methods. One of the broad aims of the group is to develop a framework for the realization of our research charter. A related objective is to develop methods appropriate to our research objectives and a language for communicating the insights of our research to our colleagues at PARC and those in our various professional communities.” (Balsamo et al. 2000)

In short, the group was tasked with prototyping “new genres” (new forms of documents) as part of Xerox PARC’s longterm research and development strategy. Since these new genres were defined by not only their potential technical specifications, but also their social uses, the group was also charged with devising methodology to explore and communicate a holistic vision of how technology could be, embedded into the sociotechnical contexts of the future. “Speculative design research” was one such methodology. When approached by the museum to install a temporary installation, the group chose to pursue the topic of reading both because it “afforded an opportunity for the study and creation of new genres” of document use and because it was relevant “to the core technology of Xerox”: “[w]e [Xerox] make things [printers] that make things [documents] that people read” (Harrison et al. 2001b). (Indeed, Xerox’s corporate tagline at the time was “The Document Company.”) The group also committed itself to an authorial stance, “challeng[ing] the dominant paradigms of user testing,” by not conducting traditional HCI user tests of the exhibits (Harrison et al. 2001b). This also highlights a reflexiveness about how presentation and meaning-making in museums differed from lab-based settings.

Their papers provide a couple examples of what was exhibited in a speculative experiment in the future of reading. One of the exhibits was of a reading device that could be tilted in various directions to move through documents. Another was of a story “tree” with moving branches that could be dragged to the center of the screen to navigate through the narrative of a comic book. In subsequent publications about

this exhibit, the authors explain that the interface for the tree, Henry's Hyperbolic World, used a "hyperbolic browser" which was developed at PARC. They argue for the importance of using design to influence the future by invoking PARC's axiom: "[t]he best way to predict the future is to invent it" (Harrison et al. 2001a).

Another design that the researchers considered but ultimately did not include was called "The Adventures of the Red Dot, which was intended to showcase a "paper-moving" technology that was currently development at PARC. The design was not included in the exhibit because, as the authors described, "the technology was not ready—or more accurately, the technology developers were not ready" (Harrison et al. 2001a). From here we can see that speculative design was being used to imagine not only alternative "futures", but also alternative "(very near)-presents" – in which interdisciplinary teams of academic researchers collaborated with product development to experiment with and evaluate specific research prototypes that were on the imminent cusp of becoming 'real'. Though the specific organizational relationship between RED and the rest of PARC is not discussed directly, it is clear from these designs that RED interfaced significantly with the product development teams, finding ways to showcase early prototypes and give their input about what future to design for. Funding for the exhibit was also provided from a marketing division at Xerox (Balsamo et al. 2000). This exhibit was one way for researchers to engage with technology developers while generating hype for the company and their role within it.

It is worth noting that PARC presents a somewhat unique disciplinary blending in a corporate-funded research organization. At its founding in the 1970s, PARC researchers were largely independent from working on improving existing Xerox products, described by journalist Michael Hiltzik as a "corporate research center as a sort of public benefit, like...underwriting opera performances on television." (Hiltzik 2000). In the 1980s, they employed anthropologists and social scientists, including Lucy Suchman, Julian Orr, and others. The RED group brought together researchers from a range of technical, social, and artistic disciplines. This is not to say PARC was separate from Xerox, in fact they interfaced in many and complex ways—the RED group's reading exhibit had funding from Xerox marketing and their papers contextualize the exhibit in terms of Xerox's broader corporate goals (though at the same time, Xerox the corporation was also reportedly considering selling off PARC (Deutsch 2000)). Seeing speculative design arise in this complex set of relationships provides insight into ways speculative design can move among different audiences, disciplines, and purposes.

#### ***10.4.1 Blurring the boundary between "speculative" and "practical"***

The idea of employing interdisciplinary teams of researchers within Research & Development branches of organizations to explore sociotechnical aspects of technology development was not unique to Xerox PARC. For example, Intel's move into mobile technologies was credited to the work of a group founded by anthropologist Genevieve Bell, who was able to "sense the market and identify the emerging signals and what is going to matter to the end user" (Singer 2014). What is relevant though, is that these research teams did not just try to divine the future, but also developed a language to 'push' sociotechnical implications of developing technology to the rest of the company (or as Bell termed it, "I am firmly in the present... but sometimes, I want to drag the future here and see if we want it" (Singer 2014)). Leveraging the tools of prototyping and product design was part of this language. So while the PARC RED group positions themselves as explicitly designing "against convention" (Harrison et al. 2001b), part of their ability to appeal to professional audiences was rooted precisely in their ability to appropriate industry norms using forms that would appear conventional to the rest of the company (sometimes literally weaving existing technology under development at PARC as part of their speculative design installation.)

When the authors from RED explained where they got the idea of speculative design, they drew from and cited a litany of disciplinary backgrounds, including architecture, engineering, arts, and humanities in a way that follows from their interdisciplinary composition. Yet as a historical moment, we see that the first instance of literal "speculative design" from within HCI comes from a corporate research context to balance the opportunities and constraints presented to these researchers by their organizational location. While the disciplinary history often traced in HCI when writing about Speculative Design as a method is rooted in references to critical theory and radical art practices (etc.), the practical uptake, as it happened in our field, by people writing in our field and publishing to our conferences, happened in context of unique disciplinary blending in a corporate-sponsored research and development lab.

As history shows, the complex interface between "speculative" and "corporate" did not stop with corporate research and development. In 2004, speculative design was ported over into an academic research context and employed to help explore the design space of cleaning product needs for an elderly population. After presenting the designs (including book shaped bottles so that cleaning products could be stored in easy-to-reach places and a "hands-and-knees" shaped brush extension for people with mobility issues), the author writes that "these concepts were well-received by S.C. Johnson, because they challenged the company's traditional ways of thinking. In corporate settings designers can become stymied by their familiarity with their company's products; speculative designs provide a fresh perspective" (Wyche 2005).

In these early examples of using speculative design, there is undoubtedly a tension between how, on the one hand, speculative design is meant to be in contrast with what is practical, pragmatic design focusing on immediate user needs, but on the other hand, speculative design is being used to speak to the same audiences who participate in corporate design—either to communicate or predict what the future

could hold, as RED was doing, or “open new spaces for design” for what product designers should or ought to design. Certainly for the people employed in corporate research and development fields (who themselves bear a complex relationship to what is immediately “practical”) this distinction has already been always troubled. In these early examples of speculative design we can see that the distinction between “speculative” and “practical” design is riddled with situational complexities that make it hard to say that speculative is the opposite of practical.

Our argument is that Speculative Design methods easily took root in the corporate context because conventional corporate research and design were already rife with other speculative practices. What it enabled researchers to do was move between different forms of “speculation”: from forecasting the future (divining future trends so that the company may better prepare for them) to critically interrogating the version of future that is currently being imagined by technologists and asking whether it’s the right one. Researchers are able to leverage the rhetoric of speculative design to advance this critical orientation in part because of the ambiguity of what is “speculative” about speculative design, and in part because the method of design speculation “works” in corporate contexts due to its high compatibility with corporate business-as-usual. Ultimately, we believe that the method of speculative design itself—the designing of artifacts to communicate what the future could hold or opening new spaces for design— may be the most *conventional* part of critically oriented, third wave practice, and that the critical project lies in leveraging these practices to take a political stance on sociopolitical issues.

In order to make this argument, we will compare the rhetorical work of Speculative Design (which HCI has accepted as a critically oriented method) with two other methods that have purchase in corporate contexts: concept videos and scenario planning. We will read the two methods through the lens of Speculative Design – that is, reading them as if they were speculative design with an explicitly critical orientation. This reading will help us see the rhetorical work Speculative Design does, and how critical agendas can be legitimated by speaking the language of corporate stakeholder communities.

## 10.5 Corporate Concept Videos

Concept videos and vision videos are speculative practices (i.e. future-oriented, imaginative, and looking beyond immediate concerns; not necessarily critically oriented) in which videos are used to depict short stories or scenarios about possible technical futures. They have historically been used in both commercial product development processes and in HCI research contexts. Concept videos are videos depicting a near-future technology being used in a variety of environments, often created by companies in advance of the release or manufacturing of a product. Examples include Apple’s Knowledge Navigator video in 1987, Google’s video of their heads up display glasses Glass in 2012, Microsoft’s video of their augmented

reality headset HoloLens in 2015, or Amazon.com's video of their proposed automated drone-based delivery service Prime Air in 2013<sup>1</sup>. Sometimes a system similar to the depicted artifact becomes produced and sold (such as Glass and HoloLens), while others do not come to fruition (such as the Knowledge Navigator, and at the time of writing, Prime Air).

Concept videos create a narrative world that takes place in the future, depicting technical artifacts and how humans interact with them, sometimes including a narrator or voiceover as well. For instance, a narrator in a 2015 video for Amazon Prime Air invites viewers to step into "the not too distant future" and imagine using an automated drone delivery service.<sup>2</sup> The viewer is then shown a family that lives in a suburban home. The family's daughter has a soccer match that day, but the family's bulldog tore up her shoes. The mother uses a tablet to orders a new pair of shoes using Amazon's Prime Air service. The viewer is then shown an Amazon warehouse, as a worker's hands packages a pair of shoes which is then automatically loaded into an Amazon drone. The drone then takes off on its own, flies to the family's house, lands by itself in their backyard, and deposits the package before departing again. Inside the house, the mother takes the new pair of shoes out of the Prime Air box and gives them to the daughter, and the bulldog, gets a new chew toy. Concept videos such as this one embed a vision about the future sociotechnical configuration of the world—including ideas about how computing should be done, for whom, and the norms that might exist in that world.

Vision videos similarly provide a form of corporate speculation, helping to articulate a company's research vision by representing a future world (often one that is amenable to products and services relevant to that company). These videos imagine a broader world (rather than a specific product), such as the "future of productivity," bringing a vision of a possible future into the present (Kinsley 2010). An example includes AT&T's 1993 "Connections" video<sup>3</sup> which explores a range of virtual reality and screen-based communication and collaboration systems in different settings, against the backdrop of a story in which a city planner encounters a group resisting the demolition of a community center to build new apartments. Within this world, the planner's son uses a virtual reality headset to play a fantasy game with his friends; his daughter introduces her parents to her fiancé using a public video phonebooth at the airport; and his wife conducts a medical diagnosis remotely via videophone. Depicted interactions hint at a broader range of technical capabilities and social arrangements: human-like avatars of "artificial agents" on videoconference screens suggest changes in the ways that business responsibilities and labor arrangements are delegated among human and non-human agents.

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<sup>1</sup> Knowledge Navigator Video viewable at: <https://archive.org/details/youtube-hb4AzF6wEoc>; Glass Video viewable at: [https://archive.org/details/GoogleGlass\\_201307](https://archive.org/details/GoogleGlass_201307); HoloLens Video viewable at: <https://archive.org/details/HoloLensAd>; Prime Air Videos viewable at: <https://archive.org/details/AmazonPrimeAir> (Accessed December 2017)

<sup>2</sup> Video viewable at: <https://archive.org/details/PrimeAirVideo01> (Accessed December 2017)

<sup>3</sup> Video viewable at: <https://www.youtube.com/watch?v=yFWCoeZjx8A> (Accessed December 2017)

Throughout the video are suggestions that video-based communications, live video translations of language, database access, and voice-based interface commands are easily possible and accessible throughout the world. These types of videos are not limited to HCI contexts; for instance, SpaceX’s “Interplanetary Transport System” video<sup>4</sup> depicts the imagined flight stages of a large manned spacecraft flying from Earth to Mars, suggesting the technological advancements that might be made in this future. While not explicitly addressed, the depiction of a large-scale interplanetary system implicitly hints at social and political changes that might have to occur in order for a mission of this scale to be feasible.

These videos tend to play out as short scenes or vignettes with characters in short plots and stories. These videos are highly produced, often with high quality acting, lighting, camerawork, and background music. Some have narrators, though most use tropes from television, depicting short dramatic or comedic plots which often involve characters utilizing imagined technology systems to solve problems or accomplish tasks.

Concept videos and vision videos exist on a spectrum; nevertheless, both use videos to imagine technology use in the near future. (For the rest of the chapter, we use the term “concept videos” to refer to both of these practices.) Like speculative designs, concept videos try to bring an imagined future to the present, asking viewers to enter these worlds *as if* they are real. At the same time, these concept videos portray technologies that companies *intend to make* real in some form. Knowing that these videos are authored by large corporations with existing products may serve as a perceptual bridge to allow viewers to more easily imagine the concept videos as real. Yet these videos are still speculative in that the specific sociotechnical configurations of the world of the video are unlikely to come to fruition. The scenes depicted in these videos tend to assume that technologies will always work as intended, and often assume that the social norms and societal roles that exist during the production of the videos will remain constant decades later. Thus these videos are not divining the future; rather they rhetorically use the creation of an imagined future to set an agenda for research and development, or to articulate a shared corporate vision.

Like in our earlier discussion of Speculative Design, there is some ambiguity and multiplicity to the purposes of concept videos. At first glance, these videos seem to predominantly reflect corporate agendas or advertising imperatives, fueling demand and creating markets for new products and services. In this sense, the future they imagine is one in which corporate products are highly desired objects. However the videos are not necessarily apolitical. For instance, Apple’s Knowledge Navigator video shows a computer interface in a professor’s study allowing him to interact with an artificial agent while checking messages, preparing a lecture, and video conferencing with other researchers. Yet the content of the professor’s research is about deforestation and global warming, suggesting environmental sociopolitical commentary. The aforementioned AT&T “Connections” video raises socioeco-

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<sup>4</sup> Viewable at: [https://www.youtube.com/watch?v=0qo78R\\_yYFA](https://www.youtube.com/watch?v=0qo78R_yYFA) (Accessed December 2017)

conomic questions about urban development, balancing community desires with housing needs. In this sense, while concept videos do the acceptable work of corporate speculation—imagining and forecasting new products and new contexts for use—the videos also provide some ambiguity and maneuverability to ask sociopolitical questions, suggesting political standpoints in debates which continue to be prevalent decades later.

### *10.5.1 Concept Videos as corporate prototyping*

Concept videos have a longer history, as throughout the 20<sup>th</sup> century corporations have released short films imagining future technologies in domains ranging from telecommunications to transportation to the home. But the practice of creating concept videos also has historical interfaces with HCI through the practice of video prototyping.

Several HCI researchers adapted the format of the concept video to create video prototypes or video scenarios. In a 1994 CHI paper, Bruce Tognazzini writes about the creation of Sun Microsystems' "Starfire" concept video in terms of a video prototype, trying to articulate a "believable ten-year vision", and discusses a range of decisions about how they depicted interactions, hardware, users; how they created a scenario; and choices in filming techniques (Tognazzini 1994). Tognazzini discusses the concept video in several ways, including common HCI concerns about exploring user interactions, input devices, and use cases. But he also discusses the rhetorical power that a professionally produced concept video can have with multiple audiences:

When at Apple, several Starfire members, including this author, worked on a project to develop a series of vignettes showing future users accomplishing tasks with experimental interfaces. The final results were shot inhouse in video with practically no budget. Managers and outsiders were unable to look past the dearth of production values and appreciate the ideas expressed. The project had virtually no impact on Apple's future direction. [...]

We were interested in "Starfire" having a profound effect. We launched a full-blown fund-raising effort, garnering support not only within engineering, but within marketing, sales, and public relations. These latter people do not intend to shell out money for a film showing people with dour expressions making errors while stumbling through a prototype system. They want happy people basking in the warm glow of a computer that always works. We wanted to do our best to ensure that those happy people would be just as happy ten years from now when they sat down at the real thing. (Tognazzini 1994)

These reflections highlight tensions in situating concept videos as both a part of HCI prototyping practice and corporate visioning practice; and they highlight the ways in which concept videos' ambiguity around how they are speculative allows the videos to shift across different audiences and purposes. In this telling, a professionally produced video (showing happy users) was needed to create a perceptual bridge for the marketing, sales, and public relations viewers who the authors wanted

to reach and get funding from. This also highlights how the video, beyond showcasing a series of interactions, also serves a broader corporate visioning imperative. During the same time period, others doing HCI work adopted the notion of concept videos toward other purposes, often focusing on depicting a specific interface design and interaction, rather than situating the technology in a story or scenario. Others, while inspired by highly produced concept videos “intended for marketing purposes,” began to use hand-based animation, computer animation, and other video-making techniques for prototyping (Vertelney 1989).

### ***10.5.2 Critically Re-imagining concept videos***

While concept videos are speculative in a future-oriented imaginative sense, third wave HCI researchers can approach concept videos by reading them as artifacts or texts for critical analysis using the lens of critically-oriented Speculative Design. While the videos often present flashy and clean, almost utopian futures, analyzing the videos as speculative artifacts helps surface aspects of the companies’ narratives that may not be at their central focus, but could have significant implications for people if those narratives come to fruition. For example, prior critical analysis of the aforementioned Amazon Prime Air videos through the lens of Speculative Design suggests how the videos’ camera angles and depictions of drone behaviors construct a notion that the drone is conscientious of some aspects of homeowners’ privacy (Wong and Mulligan 2016a). Relatedly, critical analyses of the future visions presented in philanthropic IT advertisements through this lens suggest that these visions represent “impossible futures” of competing promises and moral imperatives that philanthropic organizations should pursue and adopt in order to be seen as “good” (Harmon et al. 2017).

Additionally, concept videos are situated differently than Speculative Design artifacts originating from academic research. They are authored by companies, and viewed by numerous public audiences who experience, interpret, and critique the videos in multiple ways. In this sense, concept videos correspond with Latour’s account of things seemingly having lives of their own, taking on new meanings, actions, or consequences when placed in different assemblages (Latour 1992). Heeding Latour’s call to “follow the actors themselves” (Latour 2005) suggests looking at the ways in which concept videos act and are acted upon in the world. Authors in HCI and Science & Technology Studies discuss how representations of technology influence broader perceptions, reactions, and debates, and how collective processes of imagination are expressed through and facilitated in part by processes of cultural production (Jasanoff and Kim 2009; Dourish and Bell 2011; Harmon and Mazmanian 2013). For instance, analyzing press reaction to Google Glass and Microsoft HoloLens concept videos shows that media authors used the videos as a starting point to further imagine the future world with Glass and HoloLens, and the implications of living in those worlds (Wong and Mulligan 2016b). Yet the media authors portrayed the future in two different ways: some discussed the future by

critiquing the world depicted in the companies' concept videos, while others accepted the depicted worlds. Wong and Mulligan term these two orientations of reading concept videos as "speculative" and "anticipatory." "Speculative orientations" toward the future acknowledge multiple possible futures, often with a critical lens. People utilizing this orientation may critique the future that the video depicts or present an alternate future. "Anticipatory orientations" toward the future foresee a singular future, where people's practices in the present work to maintain and move toward a *particular* vision and expectation of the future.

Speculative and anticipatory orientations are similar to Hall's description of how viewers may decode discourses (Hall 1980), mapping onto oppositional code and dominant-hegemonic code, respectively, where oppositional means that the viewer interprets the media in a way that contests the author's intended meaning while dominant-hegemonic means that the viewer interprets the media with the author's intended meaning. This acknowledges the role that viewers play in creating the meaning of the videos. The speculative and anticipatory orientations also add a forward-looking or imaginative aspect to the process of decoding. These orientations are not mutually exclusive, but rather lay on a spectrum. However, distinguishing between them allows us to be more precise about ways people discuss and imagine futures. When people adopt a speculative orientation toward the future, it suggests an opportunity to change and refine designs, and to consider other future sociotechnical worlds. The adoption of anticipatory orientations may suggest greater acceptance of a particular envisioned future, but it may also signal lessened space and receptiveness for critique or discussion.

A third code described by Hall, negotiated codes, sits in between dominant and oppositional codes, in which the reader understands and broadly accepts the dominant code, but sometimes resists or modifies it in response to their situated position. As Hall discusses, "this negotiated version of the dominant ideology is thus shot through with contradictions." (Hall 1980). We propose that third wave Speculative Design practitioners can use a "negotiated" reading of corporate concept videos, re-reading them through the lens of third wave Speculative Design, that is, to read the videos through the a critically-oriented lens, highlighting the videos' sociopolitical stances. What is perhaps most interesting in this discussion is that while not intentionally created as critically-oriented Speculative Designs, concept videos can take on aspects of Speculative Design in the eyes of viewers when analyzed through a speculative orientation. The researcher, as analyst, can move between reading the video as a corporate forecasting artifact, and as a critically-oriented artifact by bringing a critical and reflexive lens to the futures presented in the concept videos even if they were not intentionally created as such.

Looking at corporate concept videos as speculative artifacts can be useful in several ways: First, the videos can be analyzed as types of speculative texts by researchers, to critically probe the values and politics imagined in the videos. Second, "following" the videos allows us to see how a broader audience engages with and may contest the politics and values of the futures and worlds presented in the concept videos. Third, the form of the concept video—the clean, glossy focus on an imag-

ined product in a variety of settings—could be useful for creating video-based Speculative Design artifacts that are intentionally critical in their aims, as a way to explore and critique the development of commercial products. Speculative Design artifacts in the form of concept videos might also be used by HCI researchers as a rhetorical tool that is more widely accessible than academic papers and can engage broader audiences, such as Superflux’s video *Drone Aviary* and Matsuda’s video *HYPER-REALITY* (Superflux 2015; Matsuda 2016) which both critique imagined futures around drone surveillance and augmented reality and have both been viewed by hundreds of thousands of people. The widespread popularity and acceptance of the form of concept videos may serve to legitimize the arguments made through Speculative Designs that take the form of concept videos.

## 10.6 Scenario Planning

Corporate concept videos are not the only form of corporate-based speculation and forecasting that has historical interfaces with speculative HCI practices. While concept videos tend to focus on how specific products or objects might take place in an imagined world, scenario planning (or “strategic planning” or “scenario thinking”) provides a process for thinking about, planning for, or decision making in a future with risk or uncertainties, often used as a part of futures studies. While working at the RAND Corporation, a think tank closely associated with the U.S. military, Herman Kahn developed scenario planning to think about potential outcomes of nuclear warfare during the Cold War (Kahn 1962). Scenario planning in the corporate world has origins in Royal Dutch Shell in the 1960s and 1970s, during a period of uncertainty about the future of oil prices (Wack 1985). Scenario planning identifies critical uncertainties and explicates multiple possible futures that could develop, helping to prevent failures of imagination. Importantly, scenarios have both a logical “plot line” and a narrative “story” (Weber 1996) – the plot provides a plausible logic underlying a narrative story about the future, not too unlike the para-functionality of Speculative Design artifacts. Scenario planning also tends to focus on deeper uncertainties or trends that may indirectly, but importantly affect dimensions of a particular phenomenon being studied; while originally used for oil prices and Cold War outcomes, scenario planning has been applied to a wide range of areas, such as the futures of work, pharmaceutical drugs, national security, or cybersecurity.

Scenario planning seeks to bring attention to the future’s openness, contingency, and irreducible uncertainty, as well as expand people’s conceptions of what may be possible or plausible – not just probable (Wilkinson and Kupers 2013). Scenarios generally take the form of text, describing multiple possible futures around a given phenomenon. They generally include a number of fictional artifacts to help make those futures feel more real, such as fictional news articles, personas, websites, videos, or other artifacts from those worlds.

Today, scenario planning is predominantly used by companies and government organizations to understand the effect of potential futures on consumer and financial

markets or on national security. However, there are also some new applications of scenario planning in research environments. One example of a scenario planning process in research is the University of California Berkeley Center for Long-Term Cybersecurity's "Cybersecurity Futures 2020" report (Center for Long-Term Cybersecurity 2016). The report describes its methodology for iteratively developing a set scenarios: first creating a set of prototype scenarios with a diverse group of people from academia working in a wide range of disciplines, industry, government, and non-profit organizations; then with a smaller group, identifying "most uncertain and most important" underlying drivers of change in those scenarios (which might stem from a diverse set of domains, such as changing economic conditions or social norms), using those driving forces to refine the set of scenarios; then sharing the draft scenarios with stakeholders and refining again. It describes its purpose as "creat[ing] a usable representation of an imaginative map of the possibility space—stretched in some respects to the boundaries of plausibility—that researchers, decision-makers, and policymakers can use to help navigate the future" (Center for Long-Term Cybersecurity 2016).

The report presents five scenarios describing five different versions of the world in 2020 in which "cybersecurity" means something different (such as a world in which cybersecurity is tightly associated with the ability to hide one's emotions, or a world in which the stealing of personal data and personal information becomes normal and expected behavior). The text of each scenario includes a description of the world in 2020, a plot line of how events could unfold from 2015 to 2020, and implications for cybersecurity (construed broadly—cybersecurity is discussed in social, economic, and political terms as well as technical ones). For each scenario, the report also presents a number of artifacts "from the future" such as news articles, editorials, product advertisements, personal diary entries, or wikileaks documents. These artifacts help provide insight into everyday experiences as well as contested viewpoints that might exist in the world of a scenario.

### ***10.6.1 Scenario planning in the HCI toolkit***

Traditional scenarios in HCI work may at first seem different from the aforementioned practice of scenario planning, yet these practices also interface in several ways. HCI scenarios tend to focus on a user's interactions with a particular system rather than describing the world at large. Scenarios in HCI literature began to grow in the 1980s and 1990s, applied to a wide variety of uses (and perhaps unsurprisingly accompanies a growth in literature expressing concern about the increasing fuzziness of the term "scenario"), four of which are described by Campbell as: scenarios to illustrate what it's like to use a system; scenarios to specify tasks for usability tests and other evaluations; scenarios as a tool to help design a system; and scenarios to help translate theories into practices (Campbell 1992). Within HCI, scenario practices were used across academic and industry research. Providing a link between scenario planning and HCI scenarios is John M. Carroll, who worked at

IBM Research in the 1980s and early 1990s. In his book, *Making Use*, Carroll describes design scenarios in a similar way to scenario planning: “Scenarios are stories—stories about people and their activities”, they have a setting, include agents or actors with goals or objectives (which sometimes change), include a plot through a sequence of actions and events, and are represented in ways that make a system’s use explicit (Carroll 2000). Carroll later specifically writes about scenario planning (using the term “strategic planning”), writing:

“Strategic planning is actually the deepest root of scenario-based design... Strategic management scenarios are employed to concretize the complex uncertainties that inhere in envisioning future opportunities and risks. They are used to expose hidden assumptions about the present and the future and to allow analysts to contrast entailments of alternate policies, each encompassing a constellation of assumptions and conjectures about the current situation and its likely course of evolution. They have been found to help with the enumeration prerequisite actions that would need to be taken in order for some envisioned future to occur” (Carroll 2000)

Relatedly, Carroll argues that “Creating and using scenarios pushes designers beyond static answers. ... This emphasis on raising questions makes it easier for designers to integrate reflection and action in their own design practice.” (Carroll 2000) He specifically refers to examples of Kahn at RAND and Wack’s discussion of Shell’s scenarios to illustrate this point. In later work, Carroll connects the uses of scenarios in scenario planning, HCI, and in software engineering, by arguing that their *scopes* are nested. That is, software engineering scenarios focus at the “key-stroke command” level; HCI scenarios focus on a broader “day in the life”; and strategic planning scenarios depict an even broader “year in the life.” (Go and Carroll 2004).

In this discussion of scenarios in both HCI and strategic management, Carroll underscores a commitment to imagining futures and questioning one’s assumptions, but in service of designing more usable systems. Scenarios are posited as a tool that can help a designer, researcher, or analyst rethink their assumptions about the world (from how a country might react to a nuclear strike to how a person’s needs might cause them to interact with a system in a novel way). Scenarios are speculative in the forward-looking, imaginative sense. While they may not be explicitly critically-oriented, they do serve to help people question their assumptions. Scenarios in this sense are a tool to help make decisions. The use of creating narratives, futures, and creating “reflections” is thus legitimated as a normative HCI practice in service of making a “better” design decision, generally by making a system more usable for a population of users or consumers. Left unsaid at this time was the type of reflective (and reflexive) practices espoused by later HCI researchers that recognize designers’, researchers’, and analysts’ complicity in shaping and creating knowledge.

### ***10.6.2 Critically Re-engaging scenario planning***

Scenarios have a varied history moving among industry, academic, and government spaces, both inside and outside of HCI – generally with a commitment to seeing the future as uncertain, and being willing to question one’s assumptions about how the world works. Speculative Design can build on this rich history in several ways.

First, scenario planning’s focus on imagining broader worlds might be useful in inspiring the creation of speculative artifacts. Pargman et al. suggest that scenario planning’s ability to imagine systemic effects in imagined futures and longer-term perspectives could be useful to help expand and broaden beyond HCI’s usual focus “on gadgets and on maximizing the ‘wow factor.’” (Pargman et al. 2017). Like Go and Carroll, Pargman et al seem to distinguish between scenario planning and HCI scenarios (including Speculative Design) based on their scope. We instead use the lens of ambiguity to think about the relationship between scenario planning and Speculative Design, proposing that while both take similar stances toward imagining alternate sociotechnical configurations of the world, they maintain ambiguity at different scopes within their imagined worlds.

Speculative Designs in HCI generally portray a specific artifact, but provide ambiguity about the broader world in which it exists by not fully specifying how or where the design would be implemented, allowing a viewer to imagine those details for themselves. Gaver discusses how maintaining ambiguity and provisionally in conceptual and speculative designs allows them to take on lives of their own apart from their designers, open to multiple interpretations (Gaver 2011). Alternatively, scenario planning tends to be precise about the macro-level trends that help sketch out the world of a scenario. What the scenario’s world looks like at a local situated level tends to be ambiguous. While a number of fictional artifacts may help ground parts of the scenario, they only represent a partial experience of the broader world described in the scenario.

Some of this stems from differences in the process of world creation in scenario planning. Speculative Design creates a world from the inside-out, starting by describing the particular. By focusing on specific speculative artifacts, it tries to make a particular piece of the imagined world seem real. It is largely left up to the viewer to imagine what the broader world might look like. Scenario planning creates a world from the outside-in, starting by describing the world’s broad outlines by focusing on macro-level systemic trends. While providing a few specific examples to flesh out its scenarios, it largely leaves the particulars of its imagined worlds ambiguous, for viewers and readers to fill in. This suggests utilizing different approaches and starting points to creating speculative worlds based on one’s questions and desired level of analysis.

While ambiguity has often been discussed as a resource for design, openness and provisionality can also be confusing for others who encounter speculative artifacts. A variety of “perceptual bridges” have been discussed in speculative design, such as relating speculation to the familiar or everyday through para-functionality, blurring the real and fictional, or providing a familiar “hook” such as basing designs on

popular speculative fiction (Auger 2013; Wong et al. 2017). Scenario planning suggests another possible perceptual bridge for future-oriented speculative design. Tracing a fictional yet possible plot line of events from the present to the future world suggested by the speculative artifact may help enable a broader population to suspend their disbelief and engage with the speculation as if it were real.

Second, Speculative Design can be used as a critically-oriented lens to analyze existing scenario artifacts. Similar to how scenarios help highlight how designers can make use of ambiguity at different scopes to move back and forth between particular experiences and broader world-level trends, some ambiguity in the type speculation that scenarios do allows the analyst to move back and forth to view scenarios as both a forecasting tool and as a potentially critically-oriented set of objects. Scenario planning has been an object of study for some in anthropology and science and technology studies, mostly those studying the role of risk in modernity (Lakoff 2008; Samimian-Darash 2013). In some sense, all scenarios and plans are “speculative”, in the sense that they are always uncertain forecasts. They never come to fruition exactly as described; rather they focus on helping a population being “prepared” for a range of possible contingencies. As in our earlier discussion of concept videos, a Speculative Design lens can be used to critically “read” scenarios as speculative artifacts, to question and probe what types of futures scenarios envision, and perhaps more importantly, what types of futures they do not envision. Reading them this way can bring a reflexive eye to understanding the ways in which scenarios help create possibilities and constraints for knowledge production.

Third, with regard to the practice and process of Speculative Design, scenario planning may provide insight for creating, sharing, and communicating Speculative Designs. Scenario planning’s stakeholder engagement in the creation and refinement of scenarios may provide lessons for speculative co-designing activities with non-designers and for engaging with audiences HCI has historically been in less conversation with, such as policymakers. Importantly, scenarios are not seen as end products, but as tools for decision making. This suggests thinking about ways in which speculative design artifacts could be used after the process of design. While decision making might be one type of use, one might imagine Speculative Design artifacts in public forums, as educational tools, or even becoming part of infrastructures. Speculative Design work can expand its scope of inquiry to not only investigate the process of design and the artifacts resulting from that process, but in attending to the ways in which Speculative Design artifacts can travel, be shared and communicated, and be (re)appropriated.

## 10.7 Speculative Design as Legitimizing Practice

The common story of Speculative Design is that the practice of imagining alternate futures removed from commercial constraints, seeing the future as multiple and uncertain, and not immediately focusing user needs, is what makes it a third wave approach, contrasting with dominant user-centered design approaches in HCI. In

our re-telling of Speculative Design's history, we situate Speculative Design as a research practice situated in a unique space blending corporate and academic research, utilized by Xerox PARC to divine "new genres" of technology use, highlighting the ways in which speculative design has provided purchase in corporate-shaped environments. We further explore other speculative practices with clearer corporate origins—concept videos and scenario planning—which have both been used for at least several decades and have also had some presence in HCI research. These practices, though future-oriented, imaginative, and focusing on sociotechnical issues, are not necessarily explicitly critically-oriented in the way that third wave Speculative Design often is, nor are they necessarily evaluated through the broader set of reflexive tools open to third wave HCI researchers.

From these reflections of speculative design in corporate practice, we suggest that the future-oriented, not focusing on immediate user needs aspects of speculative design are actually the "normal" part of Speculative Design. That is, speculative design as a method is not necessarily itself indicative a third wave approach. Rather it is the commitment to reflexivity—the situated positionality of the researcher, commitment to a political stance, and a critical reflection on sociopolitical values—within a speculative, future-oriented practice that makes it a third wave practice. As HCI practices are ongoingly translated—between corporate, academic, research, and product environments—wrapping this reflexivity in the language of innovation, speculation, and long term futures in speculative design is what legitimates it as a useful and valuable practice, because these are already seen as valuable in the community, particularly in the corporate community.

### ***10.7.1 "speculative design" and "Speculative Design"***

So where does all of this leave speculative design and Third Wave HCI? This outline of historical and current speculative practices situated in corporate technology companies allows us to think about speculative design in new ways. Traditionally, Speculative Design's focus beyond immediate user needs and immediate systems is portrayed as outside commercial design constraints are used to justify how it might be part of a third wave research agenda. However, industry corporations have historically embraced a range of speculative, future-oriented practices to encourage and motivate research and development, including "speculative design" at PARC, concept videos, and scenario planning. This suggests that the futuring and speculative aspects of critically-oriented Speculative Design are not necessarily "new" but have always been a part of HCI work.

It is in the acts of futuring and speculation that legitimates critically-oriented Speculative Design as an acceptable HCI practice. Perhaps reflective of the collaborations between academia and industry that are present in HCI, the uses of speculative practices bridge academic and industry practice: with the term "speculative design" present in both, the parallel developments in concept videos and video prototyping, and the use of scenario planning along with user scenarios. One way to

read the story of Speculative Design, then, is as a tactical method; after speculative design was legitimated through its relationship to normative corporate practice, it has been strategically co-opted to “push” critical agendas in HCI spaces.

Third wave HCI helps us understand the push of speculative design into new concerns, new types of questions, and new areas of inquiry. As speculative design moved out of the corporate R&D lab towards tackling questions such as sustainability, digital technologies in the home, social inequalities, and feminist politics. The more common narratives used to explain where speculative design came from, as discussed earlier in this chapter – critical theory, literary criticism, design practice, art movements, civics, the humanities, and social sciences – began to fall into place.

More generally, authors in third wave Speculative Design sometimes cite antecedent critical technical projects. These include Suchman’s ethnomethodological account of how human actions are situated (rather than planned), challenging some of the assumptions in cognitive science and artificial intelligence research at the time (Suchman 1987); Winograd and Flores’ similar critique of assumptions cognitive science and artificial intelligence (Winograd and Flores 1987); and Agre’s call for a critical technical practice, for engineers to be more reflexive in their own practices (Agre 1997). Within HCI are also earlier strands of critical work, including: Scandinavian participatory design which reimagined relationships around labor and power, value-sensitive design which began to imagine how technologies could embody particular sets of values that societal groups think are important (Friedman 1996); and early work on ludic design or using ambiguity in design which tried to embed technologies with different sets of values or use design towards ends other than task efficiency (Gaver 2002; Sengers and Gaver 2006). These projects all imagined that design could be used to question the dominant programs and paradigms of technology development.

Seen one way, Speculative Design provides a new future-oriented method to continue advancing critical technical projects with perspectives that have roots in the arts and humanities. Seen through the third wave lens of this chapter, however, the futuring aspects of Speculative Design had already been established in a range of speculative practices already existing in industry and academic HCI research and development. The critically oriented version of Speculative Design that emerged as part of third wave HCI—one that investigated new concerns, questions, and areas of inquiry—was legitimated by speaking the established language of accepted forms of futuring in HCI (such as those of scenarios, concept videos, or product prototypes). The aforementioned citation stories of speculative design that draw on practices from the arts and humanities are themselves indicative of a third wave approach—opening existing speculative practices in HCI for adoption, interpretation, and appropriation toward a more critically oriented version of speculative design. Through this adaptation of a recognizable method, the Third Wave version of Speculative Design opens up the space for new areas of concern in HCI. But it is not through the method of speculation and futuring persay, but rather by way of what Speculative Design’s focus becomes trained on.

### ***10.7.2 Moving forward: Doing the work of critically oriented Speculative Design***

The story of Third Wave Speculative Design falls into a disciplinary narrative of “critically oriented researchers” within HCI, who have brought critique and reflection of underlying values and assumptions behind normative practices in technology design by tactically engaging with some of those normative practices in their own work (Khovanskaya et al. 2015). Khovanskaya et al. describe some of these processes in the context of HCI evaluation techniques, and the tradeoffs in applying the same sensibilities to “critical” projects. They caution that “the act of making critically oriented design interventions legible to the HCI community—i.e. tactically engaging with the “lingua franca”—shapes the nature of interactions with participants in ways that can undermine the critical goals of the project” (Khovanskaya et al. 2015). Though this project was specifically reflecting on evaluation tactics, we believe that a parallel caution holds for Speculative Design more generally.

As we move forward with Speculative Design, and in keeping with the practitioner spirit of the Third Wave HCI handbook, we present the following recommendations for design researchers and those evaluating Speculative Design. The first is to be strategic in one’s engagement with HCI’s disciplinary norms. Speculative Design gives researchers the opportunity to remix optics of corporate practice to give the appearance of productive research output to endeavors that might otherwise be relegated to “critique”. This allows critical projects to promise and present as tangible “alternatives” to current technology practices. With this privilege of passing as potentially profitable comes the responsibility to focus on the rhetorical program communicated from the speculative design work. Each research project comes with a series of subcomponents that researchers must prioritize (e.g. the theory, the design itself, the deployment, the evaluation, etc.), and our stance is that care needs to be put into making sure that the design is effective in prompting questions and communicating specific stances intended by the researchers. In other words, Speculative Design in the spirit of Third Wave HCI goes beyond articulating a technical possibility or alternative outside of current commercial constraints; practitioners of speculative design also have the responsibility to communicate a stance(s) on a societal issue (or set of issues) through the language of design (which we recognize may be more or less possible in a given context).

Our second recommendation is that Speculative Design researchers tackle the tensions of adopting the ambivalent stance that comes with using normative design practices to advance critical questions, both within their groups and projects, but also in their published work, for instance navigating tensions when using Speculative Design for multiple audiences and purposes. This includes the ambivalences in tactical moves, rhetoric, or strategies that a speculative design researcher might employ to gain access or legitimacy in spaces or communities (such as funders, companies, governments, or publications), while maintaining commitments to their political arguments. This gives guidance and resources to future workers in this field.

As our narrative shows, the future development of what is legitimate in HCI rests on prior work.

Finally, as a critical program becomes more developed and established within the discipline of HCI, the easy fruit of critique is perhaps worn out. Early framings of third wave critiques often latched onto a notion of critiquing from “outside” of disciplinary norms – for instance presenting a range of alternate values to consider beyond usability and efficiency, including “fun”, “reflection,” or “ambiguity”; or explicitly bringing in methods, theories, and constructs from other fields, including phenomenology, critical theory, ethnography, and ethnomethodology. However, this framing starts to lose its rhetorical power as these “critical” perspectives are brought into HCI and start to become normative in their own right. We propose turn, then, to maintaining *reflexivity* in our disciplinary practices. Inspired by Agre’s call for a critical technical practice, in which “rigorous reflection upon technical ideas and practices becomes an integral part of day-to-day technical work” (Agre 1997), we expand upon this to call for a disciplinary reflexivity about the role of critically-oriented work within HCI. Through this a new program emerges in establishing cohesiveness and understanding within the subfield of critically-oriented HCI. One way to do this is to do a critical (re)reading of prior speculative work – including artifacts, papers, and programs – through the lens of speculative design. It is clear to us, after looking into the disciplinary history of speculative design, that a familiar string of citations belies a more complex story of our disciplinary development. In order to keep disciplinary stories like early speculative design at Xerox PARC, for example, within our working memory, there is work to be done in documenting work in this field.

## 10.8 Conclusion

In this chapter we have described the program of Speculative Design in HCI and its rhetorical capacity to raise questions central to third wave HCI, and outside of the scope and methodological capabilities of second wave HCI. We give the legacy of speculative design that is commonly cited in HCI papers from the mid-00s onward, describing the disciplinary linkages to radical art practice, humanism, and critical theory. We then look into the history of how speculative design came to HCI by way of corporate design research initiatives and show how speculative design is similar to other professionalized methods such as concept videos and scenario planning that are used to speculate on technology in the future. When a critical lens is turned to look at how Speculative Design “works” as a method in HCI, we see that rather than being an impractical and “out-there” method, Speculative Design functions as the legitimating tactic which allows critically oriented researchers to advance third wave concerns by dressing them in the optics of innovation, speculation, and long term planning, which is then recognizable to varied audiences in the field.

From this we draw some practical recommendations for researchers in this space. If the novel part of Speculative Design is not the ‘speculation’, but rather it is the

questions raised by the design and the discourses it brings in (which is indeed what the history of speculative design shows all along, a testament to the Third Wave blending this whole time); then we call on speculative researchers to focus their energy on tactically communicating the questions and political stances through Speculative Design. Speculative Design can be a form of consciousness building, of introducing “third wave concerns” to audiences who would otherwise not engage with those ideas, but it can only do if the rhetorical program of the speculation is presented clearly. We also call on researchers to be open about the tensions in navigating the binds of working within the system for the benefit of future researchers, to advance the re-reading of past projects through a critically-oriented Speculative Design lens; to engage broader audiences and publics through Speculative Design; to consider what historical, current, and emerging design genres can be used in creating speculative designs; to consider deploying speculative design at multiple scales and scopes of world building; and to work together to document the disciplinary history of the method.

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