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Technoheritage

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This Article explores the legal revolution that is swiftly unfolding regarding the relationship between technology, user interactivity, and cultural institutions, both inside and outside of the law. At the same time that cultural properties are facing destruction from war and environmental change, we are also living in an age of unprecedented interactivity and reproduction—everywhere, museums are offering their collections for open access, 3-D printing, and new projects involving virtual and augmented reality. With the advent of other sophisticated forms of digital technology, the preservation and replication of antiquities have never been easier.

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Today's archaeological moment demonstrates both the possibilities and limitations behind "technoheritage"—the marriage of technology and cultural heritage. Toward that end, this Article argues that, in order to understand the relationship between technology and cultural heritage, it might be helpful to study the theoretical dimensions behind interactivity itself. Just as technology has the power to preserve and protect ancient artifacts, it also invites a dizzying array of legal conflicts over their digitization and replication, particularly with regards to the intersection of copyright law with cultural identity. Unpacking this further, this Article offers a tripartite taxonomy of interactivity: the first, described as extractive (drawing upon the accumulation and selection of data); the second, immersive (drawing upon new forms of user participation through virtual and augmented reality); and the third, derivative (drawing upon new possibilities of user creation). Normatively, I argue that these models of interactivity provide us with an important framework with which to examine the importance of copyright protection for cultural heritage. In the concluding section, I suggest a potential way of rethinking the museum by drawing on the logic and legal protection extended to databases and archives in an age of unprecedented user interactivity.

INTRODUCTION

In October 2015, two artists, one armed with a hidden 3-D scanner under a cashmere scarf, walked into the Neues Museum in Berlin. After allegedly

defying the no-photography rule by using a modified, low-cost motion sensor called the Kinect360, they walked out with a scan of the famous bust of Nefertiti.[1] The artists then 3-D printed their own version, titling it "The Other Nefertiti," and claimed it was a precise scan of the original. Two months later, they released the scan online with a Creative Commons license, enabling anyone with a 3-D printer to download and replicate the bust for their own purposes.[2] Their project had two motivations: first, to display the 3-D-printed version in Egypt as a statement against the historical theft of cultural properties by Western nations, and second, to protest the strict limitations that museums often place on sharing the informational data regarding their works with the public.[3]

Ironically, a few weeks later, a few tech-savvy bloggers suggested that the scan had most likely come directly from the museum's own archives.[4] But the purported falsity of the story, it seems, only further underscored the value of what the artists were trying to say about the relationship between technology, cultural artifacts, and private property. "We need to get over the stigma of the copy," explained a curator who chose to showcase *The Other Nefertiti* in a show about reproduction at the Victoria and Albert Museum.[5] "We should no longer be asking, 'should we or should we not copy?' The question is, 'What should we be copying and for what purposes?' And that inevitably brings you to political questions," he argued.

Today's era can be characterized by three overlapping and yet conflicting themes regarding the changing role of art, law, and interactivity in the face of technology. The first of these themes involves the outright destruction of antiquities which reduces the pool of available cultural heritage resources for public viewing and appreciation. Their obliteration captured the attention of

1. Charly Wilder, *Swiping a Priceless Antiquity . . . With a Scanner and a 3-D Printer*, N.Y. TIMES (Mar. 1, 2016), http://www.nytimes.com/2016/03/02/arts/design/other-nefertiti-3d-printer.html [https://perma.cc/NR29-YDDC]; *see also* Paul Docherty, *Nefertiti Hack—Questions Regarding the 3D Scan of the Bust of Nefertiti*, AMARNA3D BLOG (Feb. 26, 2016), http://www.amarna3d.com/nefertiti-hack-questions-regarding-the-3d-scan-of-the-bust-of-nefertiti [https://perma.cc/BBB2-UQYL] (describing questions raised regarding the scanning incident).

2. Nora Al-Badri & Jan Nikolai Nelles, NEFERTITI HACK, http://nefertitihack.alloversky.com [https://perma.cc/TP3T-68BE].

3. Claire Voon, *Artists Covertly Scan Bust of Nefertiti and Release the Data for Free Online*, HYPERALLERGIC (Feb. 19, 2016), http://hyperallergic.com/274635/artists-covertly-scan-bust-of-nefertiti-and-release-the-data-for-free-online [https://perma.cc/5X29-L4RL].

4. Charly Wilder, *Nefertiti 3-D Scanning Project in Germany Raises Doubts*, N.Y. TIMES (Mar. 10, 2016), http://www.nytimes.com/2016/03/11/arts/design/nefertiti-3-d-scanning-project-in-germany-raises-doubts.html [https://perma.cc/9BXF-484E]; *see also* Docherty, *supra* note 1; Fred Kahl, *There's Something Fishy About the Other Nefertiti*, GREAT FREDINI (Mar. 6, 2016), https://thegreatfredini.com/2016/03/06/theres-something-fishy-about-the-other-nefertiti [https://perma.cc/PLW8-4S3Y]; Cosmo Wenman, *The Nefertiti 3D Scan Heist is a Hoax*, COSMO WENMAN (Mar. 8, 2016), https://cosmowenman.wordpress.com/2016/03/08/the-nefertiti-3d-scan-heist-is-a-hoax [https://perma.cc/W2K4-5HCF].

5. *See* Griselda Murray Brown, *Art in the Age of Digital Reproduction*, FIN. TIMES (May 20, 2016), https://www.ft.com/content/74ffab6e-1b55-11e6-b286-cddde55ca122 (paywall) (quoting Brendan Cormier).

Congress which passed the Protect and Preserve Cultural Property Act in April 2016.[6]

The second, almost conflicting pattern, is one of marked, mass reproduction. While there is a seemingly endless array of attacks on cultural property and antiquities, there are also more ways to replicate those antiquities than ever before. With the advent of 3-D printing, mapping technologies, and other sophisticated forms of information technology, the preservation and replication of antiquities has never been easier. An entire swath of 3-D enterprises is based on the simple principle that what one group destroys or seizes, technology can recreate and duplicate, creating copies that are more enduring, more sustainable, and more user-friendly than the original antiquities that inspired them. "This is the moment we have been waiting for," said Roger Michel, the founder and executive director of the Institute for Digital Archaeology. "If they knock it down," he said, "we will rebuild it. If they knock it down again, we will rebuild it again."[7] In other words, ISIS and others may contract the pool of cultural resources, but technology expands it.[8]

However, at the same time that we might applaud technology as a remedy to the problem, there is also a third theme that focuses on the distributive and social justice questions raised by these technologies. Control and ownership of these technologies seldom coincide with that of the cultural heritage that they preserve. Here, digitization highlights uneven resource distribution, attribution, and economic inequality, particularly with respect to indigenous peoples and developing nations, who are often rich in cultural heritage and yet saddled with a legacy of colonialism and exploitation.

These issues underscore why the Nefertiti episode is so revealing. It demonstrates—to a significant degree—both the limitations and the possibilities behind the marriage of technology and cultural heritage, a phenomenon called "technoheritage." This phenomenon, while embraced by museums, poses difficult legal challenges because of its relationship to both cultural and intellectual property.[9] "While precise digital imaging of such politically and

6. *See generally* Pub. L. No. 114-151, 130 Stat. 369 (2016); H.R. 1493, 114th Cong. (2016) (implementing United Nations Security Council Resolution 2199; the President signed the bill into law on May 9, 2016); Derek Fincham, *The Syrian Conflict and the Proposed "Protect and Preserve International Cultural Property Act,"* 2 SANTANDER ART & CULTURE L. REV. 63 (2015); *see also* Patty Gerstenblith, *The Destruction of Cultural Heritage: A Crime Against Property or a Crime Against People?*, 15 J. MARSHALL REV. INTELL. PROP. L. 336, 385 n.195 (2016).

7. Stephen Farrell, *If All Else Fails, 3D Models and Robots Might Rebuild Palmyra*, N.Y. TIMES (Mar. 28, 2016), http://www.nytimes.com/2016/03/29/world/middleeast/3d-models-robots-rebuild-syrian-sites.html [https://perma.cc/NBR9-7DUK].

8. *See* Claire Voon, *In Acts of Resistance, Artists and Scholars Digitally Reconstruct the Past*, HYPERALLERGIC (Jan. 27, 2016), http://hyperallergic.com/270503/in-acts-of-resistance-artists-digitally-reconstruct-the-destroyed-past [https://perma.cc/6DHZ-P6ZW].

9. Sonia K. Katyal & Simone C. Ross, *Can Technoheritage Be Owned?*, BOS. GLOBE (May 1, 2016), https://www.bostonglobe.com/ideas/2016/04/30/kaytal/jUr7WJ5XdIUm5yLLB7HGFP/story.html.

emotionally fraught cultural properties as the Dead Sea Scrolls and the Elgin marbles have not stilled the protests about the legalities of their current physical possession," stated expert Neil Silberman, "they have nevertheless created a new kind of cultural property—a kind of meta-cultural property that represents a shared global culture that we are creating today."[10]

A central area of uncertainty is how law will govern technoheritage, both inside and outside of the museum. The issues surrounding the changing museum implicate everything from critical digital theory to cognitive science, social research, information management, and indigenous studies, in addition to a variety of other fields.[11] Indeed, there is also a great need for legal scholarship to address the issues raised by technoheritage, since they are intrinsically relevant to anyone who studies the intersection of user participation, tangible cultural property, and intellectual property. Just as technology has the power to preserve and protect tangible artifacts in our physical landscape, it also invites a dizzying array of legal conflicts over their digitization, particularly regarding the intersection of intellectual property principles and cultural identity. The more these cultural properties become digitized, the more likely intellectual property law, with all of its restrictions and limitations, will rear its head.[12]

The more interesting question, then, is whether the intersection of cultural heritage and technology will produce reruns of the same intellectual property disputes that have beset other emerging technologies, or whether new, unanticipated conflicts will arise. Answering this question requires a fundamental rethinking of interactivity within the changing institutional framework of a museum.

This Article argues that while technoheritage raises issues that are similar to the other issues that surround disruptive technologies, the uniquely complex nature of cultural heritage creates new challenges. Consequently, to understand the changing legal field that museums face, we must specifically address how technology has changed the legal and cultural role of museums, as well as the limitations and possibilities of technoheritage's place in public culture.

This Article is divided into four Parts. Part I describes the trend towards increased digitization and the changing role of museums in this process. It argues that technology has ushered in a largely undertheorized era of user interactivity and offers three models of interactivity: the first, described as *extractive* (drawing upon the accumulation and selection of data); the second, *immersive*

10. Charles Cronin, *3D Printing: Cultural Property as Intellectual Property*, 39 COLUM. J.L. & ARTS 1, 37 (2015) (quoting Neil Silberman, *From Cultural Property to Cultural Data: The Multiple Dimensions of "Ownership" in a Global Digital Age*, 21 INT'L J. CULTURAL PROP. 365, 367 (2014)).

11. Fiona Cameron & Sarah Kenderdine, *Introduction* to THEORIZING DIGITAL CULTURAL HERITAGE 2 (Fiona Cameron & Sarah Kenderdine eds., 2007). For more perspectives on the digital museum see JENNY KIDD, MUSEUMS IN THE NEW MEDIASCAPE (2014); MUSEUM REVOLUTIONS: HOW MUSEUMS CHANGE AND ARE CHANGED (Simon J. Knell, Suzanne MacLeod & Sheila Watson eds., 2007).

12. *See generally* Cronin, *supra* note 10 (discussing this point).

(drawing upon new forms of user participation through virtual and augmented reality); and the third, *derivative* (drawing upon new possibilities of user creation). Part II focuses on how law has responded to these new forms of interactivity. It outlines some of the attendant complexities in applying traditional copyright and contractual restrictions on cultural heritage objects, with a special focus on indigenous peoples' concerns. Part III turns toward the institutional questions raised by technoheritage. It explores the changing role of a museum in mediating disputes over cultural heritage and property and makes a number of suggestions to balance market concerns with the protection of the public domain. In Part IV, I suggest a novel way of rethinking the museum, and the overall model of user interactivity, by drawing on the logic and legal protection extended to databases and archives.

I.
A MUSEUM WITHOUT WALLS

Back in 1947, André Malraux, France's first Minister of Cultural Affairs (also a former prisoner of war, art critic, and novelist), wrote a book titled *Musée Imaginaire*, loosely translated to a "museum without walls."[13] The idea was both simple and beautiful: photography, he wrote, made it possible to view art suddenly free of context, pulled from its location and historical origin.[14] By extracting art from its geographical and temporal identity through reproduction, Malraux predicted that viewers could curate their own experience, viewing art from Africa next to art from Europe, or by inventing their own themes of selection and arrangement.[15]

While Malraux's observations have led to a wealth of commentary from art historians, they also reveal a timeless prescience when applied to today's themes of digitization in our information-rich society.[16] As museums are increasingly viewed as spaces for civic engagement and education, they have moved from

13. *See Malraux and the Musee Imaginaire: the "Museum Without Walls,"* CULTURE IN VIRTUAL SPACES BLOG (Jun. 17, 2014), https://culturalvirtualspaces.wordpress.com/2014/06/17/malraux-and-the-musee-imaginaire-the-museum-without-walls [https://perma.cc/8C9J-X9QG].

14. Consider this quote:

> [I]n our Museum without Walls picture, fresco, miniature and stained glass window seem of one and the same family. . . . In the process they have lost their properties as objects; but, by the same token, they have gained something: the utmost significance as to style that they can possibly acquire. . . . It is the same with figures that in reproduction lose both their original significance as objects and their function (religious or other); we see them only as works of art and they bring home to us only their makers' talent.

ANDRÉ MALRAUX, *Museum Without Walls*, *in* THE VOICES OF SILENCE 44–46 (Stuart Gilbert trans., Princeton U. Press ed. 1978) (1953) (emphasis removed).

15. *See* CULTURE IN VIRTUAL SPACES BLOG, *supra* note 13.

16. *See, e.g.*, Douglas Crimp, *On the Museum's Ruins*, 13 OCTOBER 41 (1980); Henri Zerner, *Malraux and the Power of Photography*, *in* SCULPTURE AND PHOTOGRAPHY 116 (Geraldine A. Johnson ed., 1998) (commenting on the nature of the museum and the role of Malraux, respectively).

concentrating on objects to stories, and from collections to audiences.[17] As a result, their objectives have moved beyond mere display of artworks to encompass conservation, digital cataloging, and archiving, in addition to building a number of possibilities for user participation.[18]

Today's "museum without walls" is also made possible by the advent of digitization and 3-D reproduction technologies. Many museums are now digitizing their collections in order to offer greater access to the public, raising a host of complex questions as intangible images increasingly replace tangible items of cultural heritage. For example, UNESCO's 2003 Charter recognized the importance of "digital heritage," consisting of information and its forms of digital creation, distribution, access, and preservation.[19] Further, museums now often encourage user participation.[20] One scholar, Nina Simon, wrote that "[s]upporting participation means trusting visitors' abilities as creators, remixers, and redistributors of content."[21] She noted that "regular people—not just artists or academics—appropriate cultural artifacts for their own derivative works and discussions."[22]

But I would argue that this shift towards interactivity also portends a transition from tangible property and real space into intellectual property and digital space, respectively. Things that were once tangible cultural properties have essentially become intangible, intellectual properties.[23] Their metamorphosis raises a host of questions about how law can and should be employed to regulate this process.

Given that more people have been going to museums and more scholars have been writing about museums in the twenty-first century than at any other time in history, this is the perfect time to explore these questions.[24] In previous decades, particularly in the wake of the civil rights struggles of the 1960s, museums faced widespread criticism for failing to integrate the concerns of a populous and multicultural society.[25] In response, many museums democratized

17. *See* Jennifer Shannon, *Artifacts of Collaboration at the National Museum of the American Indian*, 7 NEW PROPOSALS 37, 38 (2015).

18. For a rich discussion of the changing museum, see Megan M. Carpenter, *Drawing a Line in the Sand: Copyright Law and New Museums*, 13 VAND. J. ENT. & TECH. L. 463, 468 (2011).

19. UNESCO, CHARTER ON THE PRESERVATION OF THE DIGITAL HERITAGE *Article I* (2003), http://unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/mow/charter_preservation_digital_heritage_en.pdf [https://perma.cc/XT7F-QJAT].

20. For an excellent set of projects relating to 3-D participation, see the work of Cosmo Wenman, who has observed that "[t]here are millennia of beautiful physical forms that can be digitized, propagated, and remixed over and over again in perpetuity." Norman Chan, *Maker Profile: Cosmo Wenman's 3D-Printed Art, Tested* (Mar. 18, 2013, 9:00 AM), http://www.tested.com/inventern/454188-maker-profile-cosmo-wenmans-3d-printed-art [https://perma.cc/P9KK-FQEV] (discussing the artist's 3-D projects).

21. *See* NINA SIMON, THE PARTICIPATORY MUSEUM 3 (2010).

22. *See id.*

23. *See* Cronin, *supra* note 10, at 1.

24. *See* STEVEN CONN, DO MUSEUMS STILL NEED OBJECTS? 1 (2010).

25. *Id.* at 9.

their experience by reshaping physical spaces to be more accessible, more receptive to visitors' demands, and more interactive.[26]

Just as the identity politics of previous eras challenged museums' cultural relevance and forced them to change course, technology today compels museums to make even more dramatic changes facing the challenges of identity, interactivity, and digitization. By increasing their digital accessibility, museums can become more democratic, which in turn facilitates the democratization of culture.[27] However, these technologies paradoxically challenge the very notion of the museum itself. Digitization and personalization lend greater legitimacy to multiple interpretations from the public, which defies the fixed and monopolizing interpretation of a single curator.[28] Digitization thus presents a few choices to museums: either the museum can dilute its role in public culture in real space and cede its cultural space to the world of the Web, or it can actively embrace digitization to make the museum an even more integral part of civic life. Or it can try, as many have, to do both. Democratization not only brings a wider and more diverse audience into museums, but it also brings a museum into greater relevance to public culture and engagement.[29] All of this, of course, ultimately benefits the museum, but it also raises difficult legal questions.

While digitization has posed real challenges and opportunities for museums for several decades, very little legal scholarship has critically explored the institutional and proprietary issues it presents.[30] Consequently, we first need to better understand the nature of interactivity itself, exploring both its possibilities and its limitations.[31] Scholars argue that the ideological basis for this trend stems from neoliberalism, which tends to emphasize free-market ideals such as

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26. *Id.* at 15.

27. Melissa Terras, *Opening Access to Collections: The Making and Using of Open Digitised Cultural Content*, 39 ONLINE INFO. REV. 733, 736 (2015) (citing Andrea Sartori, *Towards an Intellectual History of Digitization: Myths, Dystopias, and Discursive Shifts in Museum Computing*, 31 DIGITAL SCHOLARSHIP HUMAN. 428, 434 (2015)).

28. Fiona Cameron & Helena Robinson, *Digital Knowledgescapes: Cultural, Theoretical, Practical, and Usage Issues Facing Museum Collection Databases in a Digital Epoch*, *in* THEORIZING DIGITAL CULTURAL HERITAGE 175, 178 (Fiona Cameron & Sarah Kenderdine eds., 2007).

29. For example, one study notes that virtually every museum that has moved towards open access images in its collection has reported increased traffic to its websites, including visits ranging from an uptick of 20 to 250 percent. *See* KRISTIN KELLY, ANDREW W. MELLON FOUND., IMAGES OF WORKS OF ART IN MUSEUM COLLECTIONS: THE EXPERIENCE OF OPEN ACCESS 24 (2013), http://www.clir.org/pubs/reports/pub157 [https://perma.cc/R3XK-FU45].

30. Cameron, *supra* note 11, at 3.

31. There is not a singular form of interactivity. Instead, it can take many diverging forms of expression, and raise a wide variety of legal questions depending on the circumstance. For discussions of interactivity and its intersection with copyright and other forms of regulation, see ERIC VON HIPPEL, DEMOCRATIZING INNOVATION (2005); Corey Field, *Copyright, Technology, and Time: Perspectives on "Interactive" as a Term of Art in Copyright Law*, 50 J. COPYRIGHT SOC'Y U.S.A. 49, 67 (2003); William W. Fisher III, *The Implications for Law of User Innovation*, 94 MINN. L. REV. 1417 (2010); Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 997 (1997); Pamela Samuelson, *Freedom to Tinker*, 17 THEORETICAL INQ. L. 563 (2016); Ed Felten, *The New Freedom to Tinker Movement*, FREEDOM TO TINKER (Mar. 21, 2013), https://freedom-to-tinker.com/2013/03/21/the-new-freedom-to-tinker-movement [https://perma.cc/89FK-Z4KS].

consumer choice and commodification.[32] With the ability to change texts and images, individuals become more than just passive viewers; instead, they become "users" that create and recode their own sets of meaning from the existing canons of art and history.[33] Interactivity can produce powerful engagement with media texts through the encouragement of more autonomous interpretations of sources of knowledge and greater user choice.[34]

Yet, despite the way that interactivity has upended the fields of media and communication, only a small portion of legal scholarship has really studied its nature or complexity in the institutional context of a museum. But this work is deeply relevant to a broad cross-section of individuals who care about access, art, and culture because it reveals some of the obstacles and opportunities faced by both institutions and the private and public regulatory paradigms that govern interactivity.

More than twenty years ago, media theorist Peter Lunenfeld identified two paradigms of interactivity in his influential article *Digital Dialectics*.[35] The first model is "extractive" because technology enables users to gather, curate, and navigate from a menu of stored information, like a database.[36] The second model, by contrast, is "immersive" because it moved from a model that was premised on access to data to a model that focused on a deeper engagement with interactivity. It enables users to experience rather than just access information so that they can explore and navigate particular spaces in virtual reality.[37]

Both of these paradigms aptly characterize the changing role of technology, user participation, and the institutions that govern them. But they also raise complex legal questions about how institutions produce, construct, and regulate interactivity. Unlike innovators that change specific products in ways that might diverge from their creators' intent, some forms of institutionalized interactivity are wholly constructed by museums, raising interesting intersections between participation and proprietary concerns.[38]

Today, thanks to technology, the modern museum has moved from a space that cast visitors as spectators, spaced apart from one another by gallery walls, into a world of collaboration. Rather than being passive observers, visitors can participate with media in ways that a museum might predict and design. The museum no longer houses a static collection of objects, but rather a set of possibilities for human experience and participation between museum, artist, and user. While Lunenfeld's dual paradigm seems apt for a world that is comprised

32. MARTIN LISTER ET AL., NEW MEDIA: A CRITICAL INTRODUCTION 20 (2d ed. 2009).

33. *Id.* at 21.

34. *Id.* at 40–41.

35. The author here was referring to hypertextual navigation. *See* Peter Lunenfeld, *Digital Dialectics: A Hybrid Theory of New Media*, 21 AFTERIMAGE 5 (1993).

36. *Id.*

37. *See id.*; *see also* LISTER, *supra* note 32 (describing Lunenfeld's immersive navigation paradigm of interactivity).

38. *See* sources cited *supra* note 31.

of two-dimensional viewing, I would also add an additional paradigm of interactivity that stems from the dramatic possibilities of 3-D printing. This third model is what I call a "derivative" model because it allows users to reproduce models of museum works through digital technology.

Each of these models—extractive, immersive, and derivative—dramatically transforms the institutional role of interactivity. These models are neither exhaustive nor exclusive from one another. Rather, they are meant to demonstrate particular flashpoints of user interactivity that deserve greater analysis and scrutiny because of the complex legal questions regarding the governance of technoheritage and traditional regulatory regimes.

A. An Extractive Model of Interactivity

By digitizing their collections, museums can retain a sense of vitality, reach out to a greater public, and invite new opportunities for collaboration. In sharing their collections with the digital public, museums empower users to extract information from their collections, which leads to decentralized forms of curation and participation. Digitization can democratize a museum by remaking it to be a more open and flexible institution, instead of one that is remote and elite.[39] Yet, according to Guy Pessach, museums are conflicted between a desire to commercialize digital images of their collections, which inevitably requires an intent to utilize intellectual property principles as a legal basis for enforcement and licensing royalties, and a desire to join the trend towards open access regimes, which are lauded for their demonstrative commitment to the public trust. This produces a central tension between profit and public access. Without intellectual property protections, there would be no legal basis for enforcement, and thus no market for licensing royalties, which would put museums' revenue streams at risk.[40]

Museums are also in an unusual position with respect to intellectual property.[41] Although they are not typically considered an "IP intensive industry," they are simultaneously licensors because they maintain a collection of artworks and images, and licensees because their collections often implicate artists' copyright and property interests.[42] It is precisely this unique position that allows

39. Andrea Witcomb, *The Materiality of Virtual Technologies: A New Approach to Thinking About the Impact of Multimedia in Museums*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 28, at 36–37.

40. *See* Guy Pessach, *Museums, Digitization and Copyright Law: Taking Stock and Looking Ahead*, 1 J INT'L MEDIA & ENT. L. 253, 254–55 (2007).

41. Their conflicting and sometimes confusing image-use policies reflect museums' unique role and the diverse approaches they take to addressing user participation. *See* Claire Voon, *How User-Friendly Are Museum Image Rights?*, HYPERALLERGIC (Jun. 10, 2016) http://hyperallergic.com/304000/how-user-friendly-are-museum-image-rights [https://perma.cc/8K4A-9NAH].

42. *See* David Gillespie, *Copyright and Its Implications for 3D Created Datasets for Cultural Heritage Institutions*, 1 INT'L J. CULTURE & HIST. 135, 135 (2015).

them to be leaders of the open access movement.[43] As William Noel, the Walters Art Museum's former curator of manuscripts, observed, "We have lost almost all control, and this has been vital to our success."[44] For example, the Rijksmuseum in Amsterdam was one of the first museums to make its collection available online. To attract a wider audience, the museum's leaders believed that they needed to provide greater digital access. Thus, they published hundreds of thousands of high-quality images online without restrictions. Afterward, commercial firms developed over thirty new applications based on the Rijksmuseum's datasets.[45] As Wim Pijbes, the General Director of the Rijksmuseum, explained:

> [U]sing the advantages of the internet to share the collection, everyone can participate to bring art anywhere, in any way, into the public domain. . . . If we want to engage a younger and new audience, it's not enough to offer a small selection of poor low-resolution images. Everyone understands that open access is the future, especially for artworks that belong to the world as part of public collections in museums. And access means publishing collections to the highest standards, technically as well as aesthetically.[46]

Other museums have followed suit. In 2013, the Los Angeles County Museum of Art made twenty thousand images available for download. The National Gallery of Art placed over forty-five thousand images in the public domain.[47] Yale offered over two hundred and fifty thousand images to the public domain, providing access that is both license- and royalty-free.[48]

In 2016, the Smithsonian released a report on open-access policies in galleries, libraries, museums, and archives.[49] The study revisited an earlier Mellon Foundation study, which concluded that the gains, real and perceived, outweighed any potential losses for museums adopting open-access policies.[50]

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43. In 2002, the International Council of Museums affirmed its commitment to public service—but also to extend itself beyond material culture—as "a place for inquiry into the memories of the past, a forum for consideration of the present, and a site from which to aspire for the future." STEPHEN E. WEIL, MAKING MUSEUMS MATTER 111 (2002).

44. KELLY, *supra* note 29, at 28.

45. Terras, *supra* note 27, at 739 (citing Merete Sanderhoff, *It's your cultural heritage. Use it.* SHARING IS CARING: OPENNESS AND SHARING IN THE CULTURAL HERITAGE SECTOR (2014).

46. *See Right or Wrong: Is It Time to Rethink Copyright Legislation?*, APOLLO (Jan. 16, 2015), http://www.apollo-magazine.com/right-wrong-time-rethink-copyright-legislation [https://perma.cc/9KM8-EN7F].

47. *NGA Images*, NAT'L GALLERY OF ART, https://images.nga.gov/en/page/show_home_page.html (last visited Mar. 15, 2017).

48. Terras, *supra* note 27, at 740.

49. *See* EFFIE KAPSALIS, SMITHSONIAN EMERGING LEADERS DEV. PROGRAM, THE IMPACT OF OPEN ACCESS ON GALLERIES, LIBRARIES, MUSEUMS AND ARCHIVES (2016), https://siarchives.si.edu/sites/default/files/pdfs/2016_03_10_OpenCollections_Public.pdf [https://perma.cc/2MW3-P6T6].

50. SIMON TANNER, ANDREW W. MELLON FOUND., REPRODUCTION CHARGING MODELS & RIGHTS POLICY FOR DIGITAL IMAGES IN AMERICAN ART MUSEUMS (2004),

Consider some examples of the spectrum of activities that have occurred in museums:

- The European Commission funded movements like the OpenGlam movement, which aim to facilitate unrestricted access to content by building a "global cultural commons for everyone to use, access and enjoy."[51]
- The British Library created a "Mechanical Curator," which selects an illustration from its collection of over sixty thousand digitized books in the public domain and posts it to Tumblr blog every hour.[52]
- The J. Paul Getty Foundation made over one hundred thousand images available. It designated almost a fifth of them "open content," which enables the download of high-resolution copies. It did so, apparently, after it realized that the expense of actually licensing images was greater than the revenue it was collecting.[53]
- The Cooper Hewitt Smithsonian Design Museum released its collections metadata with a Creative Commons open license so that it reserves no rights to the data, essentially placing it within the public domain.[54]
- The Walters Art Museum made available, under a Creative Commons license, high-resolution images of the Syriac Galen Palimpsest, which is a liturgical text used to study Christian hymns, enabling researchers and imaging technicians to develop their work further.[55]
- Several foundations, like the Bill and Melinda Gates Foundation, the Ford Foundation, and the Hewlett Foundation, require recipients to allow open access with a Creative

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http://www.kdcs.kcl.ac.uk/fileadmin/documents/pubs/USMuseum_SimonTanner.pdf [https://perma.cc/AU7G-KS5Z].

51. *FAQ*, OPENGLAM, http://openglam.org/faq [https://perma.cc/2HHY-8XHR].

52. Ben O'Steen, *A Million First Steps*, BRITISH LIBR. DIG. SCHOLARSHIP BLOG (Dec. 12, 2013, 12:50 PM), http://britishlibrary.typepad.co.uk/digital-scholarship/2013/12/a-million-first-steps.html [https://perma.cc/32UV-T2AW]; *see also* Danny Millum, *The Mechanical Curator*, IHR BLOG (Nov. 5, 2013), http://blog.history.ac.uk/2013/11/the-mechanical-curator [https://perma.cc/TM7A-LZ8A].

53. *Open Content Program*, GETTY, http://www.getty.edu/about/opencontent.html [https://perma.cc/B3NC-JSSP]; *see also* Daniel Sissman, *A New DOR Opens: How the J. Paul Getty Museum is Reimagining Digital Collection Information Management*, MW2015: MUSEUMS AND THE WEB 2015 (Feb. 15, 2015), http://mw2015.museumsandtheweb.com/paper/a-new-dor-opens-how-the-j-paul-getty-museum-is-reimagining-digital-collection-information-management [https://perma.cc/7RHC-TKSB] (software architect discussing the implications of publishing high-resolution images of its collections online).

54. KAPSALIS, *supra* note 49, at 14 ("collections metadata" provides basic information about the object, such as its title, author, medium, etc.).

55. *The Galen Syriac Palimpsest*, OPENN, http://digitalgalen.net [https://perma.cc/JBW5-GGYL].

> Commons license, which allows use for any purpose, at times, including commercial use.[56]

Undoubtedly, many more museums have digitized at least part of their collections because the benefits can be significant.[57] Open access can increase an institution's brand and prominence, which increases licensing opportunities.[58] For example, the Rijksmuseum's partnership with Heineken has led to design awards and additional partnerships with other national brands based on works from its collection.[59] When the Smithsonian's Flickr Commons images migrated to the Wikipedia community, the museum's position in search results improved dramatically.[60] The exposure led to a series of Wikipedia "edit-a-thons," which invited volunteers to create pages about its collection and resources.[61]

These projects offer a view of user interactivity that is unprecedented in the museum context largely due to its extractive possibilities. Unlike its analog counterparts, a digital museum "does not attempt to replace the material object with an electronic surrogate, but instead opens up new possibilities to harness and to enact reciprocal, user-driven scenarios, as well as new opportunities for the remote visitor to be able to interact with the museum."[62] Online, a user can digitally interact with a museum's collection through playing games, browsing the collection, downloading information about objects, or purchasing products from the museum store.[63] This shift has accelerated the democratization of the museum experience, which began after the cultural revolution of the late 1960s. It allows users to curate their experiences, decide what information is important to them, and reflect on their preferences, identities, and tastes.[64]

Similar to Malraux's description in *Musée Imaginaire* of analog photographs, this open-access model also offers a pattern of interactivity that can be characterized by its nonlinear, associative patterns of information retrieval. Like the Internet itself, a digital model of a museum offers users immediate access to partner museums and collections, and allows them to curate a wide range of background information on subject matter, particular artists, collectors,

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56. KAPSALIS, *supra* note 49, at 6–8. In fact, Creative Commons licenses have been widely used by museums and other cultural institutions to ensure digital access to their collections. See the excellent SlideShare presentation by Jane Park, *Creative Commons and Cultural Heritage*, SLIDESHARE (Dec. 12, 2014), http://www.slideshare.net/janeatcc/cc-cultural-heritage [https://perma.cc/THR4-L47W] (discussing many examples of CC licenses used by museums).

57. *See Sources*, PUB. DOMAIN REV., http://publicdomainreview.org/sources [https://perma.cc/KJ9A-Z299].

58. KAPSALIS, *supra* note 49, at 9.

59. *Id.* at 10.

60. *Id.* at 11.

61. *Id.* at 11–12, 20.

62. Susan Hazan, *A Crisis of Authority: New Lamps for Old*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 11, at 136.

63. *See id.* at 143.

64. *See* Constance Balides, *Virtual Spaces and Incorporative Logics: Contemporary Films as "Mass Ornaments*," MEDIA IN TRANSITION, http://web.mit.edu/m-i-t/articles/index_balides.html [https://perma.cc/K6DL-7B6W].

and contexts. In other words, rather than the user "following" information, the user is "extracting" information from a collection with the potential to select, research, and curate their own personalized content.[65] By enabling users to self-select information and artworks for viewing, the museum becomes more than just a destination point; it becomes a gateway to access further information. Users, as opposed to the museum, are put in charge of their own museum experience, which inverts the hierarchy between the visitor and the museum.[66]

An extractive model of interactivity leads to projects that involve much more than a simple indexing of material. Instead, they portend a new way to experience culture. In this digital era, "access to heritage is increasingly mediated through the consumption of signs, electronic images and simulacra."[67] Yet these technologies, paradoxically, also threaten the notion of a museum itself, because the promise of personalization challenges the idea of a single, fixed, homogenous curatorial voice, lending much greater legitimacy to multiple interpretations and curations of objects.[68] Digitization thus makes possible a decentralized multiplicity of meanings and subjects.

Here, digitization and individualized curation can redefine the social meaning of both artworks and institutions. Consider, for example, the Tate Britain's first Net art commission, *Uncomfortable Proximity*, by Graham Harwood.[69] There, Harwood took digital photographs of famous paintings and arranged them into montages that referenced the role of class and race in their formation.[70] The artist then created a website that mirrored the Tate's own website, but inserted his own annotated collection of personal montages, rewriting the museum's background section to note its close proximity to prison ships on the River Thames, among other forms of political and social inequality.[71] As a result, the work intentionally confused visitors and disrupted the museum's marketing department, forcing them to contemplate the Tate's relationship to acts of imprisonment.[72]

There are, of course, costs associated with an extractive, open access model. In particular, open access models increase transaction costs (due to a reliance on additional parties involved in digitization), increase staff workload, and risk the loss of potential royalty streams.[73] Staff must spend time negotiating image

65. Lunenfeld, *supra* note 35, at 6.

66. *See id.*; *see also* Peter Samis, *The Exploded Museum*, *in* DIGITAL TECHNOLOGIES AND THE MUSEUM EXPERIENCE 3 (Loïc Tallon & Kevin Walker eds., 2008).

67. Bernadette Flynn, *The Morphology of Space in Virtual Heritage*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 11, at 349.

68. Cameron & Robinson, *supra* note 28, at 178.

69. Beryl Graham, *Redefining Digital Art: Disrupting Borders*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 11, at 95; Graham Harwood, *Uncomfortable Proximity*, INTERMEDIA ART (2000), http://www2.tate.org.uk/intermediaart/entry15266.shtm [https://perma.cc/5UUB-GGFR].

70. Harwood, *supra* note 69.

71. *Id.*

72. *Id.*

73. KAPSALIS, *supra* note 49, at 10.

licenses and responding to image requests.[74] Those costs are not insignificant, as they stem from the various information costs related to licensing content, and they can lead to confusion, underutilization, overbroad representations of copyright, and a dramatic increase in administrative costs. For example, Europeana, an Internet portal that provides access to millions of works from digitized collections, has twelve different copyright licenses that can be assigned to each digital item, miring potential reuse with confusion.[75] Another example is the Google Art Project, which provides access to over forty thousand images, but offers no licensing information for each image.[76]

Increasingly, however, there are also costs associated with not adopting open access policies: one study describes how institutions that maintain restrictive policies may face decreased funding opportunities for grants, leading to a reduction in brand expansion and recognition, and opportunities for collaboration with artists and institutions.[77] Their collections will also be less visible on the Internet and will especially reduce their visibility on Wikipedia, since Wikimedia requires material from the public domain.

B. An Immersive Model of Interactivity

In addition to the rise of personalized curation, technologies like virtual and augmented reality can transform the museum experience and offer the user new models of interaction. In fact, one of the first uses of immersive virtual reality took place in a museum in 1994, when a British engineer named Colin Johnson used laserdiscs to create an interactive reconstruction of Dudley Castle in England in 1550.[78]

Although virtual reality can take different forms and definitions, the term generally describes immersion in an interactive, simulated world, complete with sensations of sight, touch, sound, and even scent.[79] Simulation thus reduces the "indexing" quality that is associated with accessing digital information, instead replacing it with a greater focus on experience and spatial modeling.[80] In contrast to most other visual models, virtual reality is not static, but instead responds to

74. *Id.* at 11.

75. Terras, *supra* note 27, at 14.

76. Terras does, however, note that a previous general statement claimed that "these images may be subject to copyright laws," and referred to its Terms of Service. *See id.*

77. KAPSALIS, *supra* note 49, at 10–11.

78. Jeremy Norman, *The First Use of Virtual Reality in a Museum or Archaeological Context*, HISTORYOFINFORMATION.COM (1994), http://www.historyofinformation.com/expanded.php?id=4542 [https://perma.cc/73UD-2295].

79. *See* Gökhan Nalbant & Barbaros Bostan, *Interaction in Virtual Reality*, *in* 4TH INT'L SYMP. OF INTERACTIVE MED. DESIGN (2006) (citing WILLIAM R. SHERMAN & ALAN B. CRAIG, UNDERSTANDING VIRTUAL REALITY 7 (2003)); *see also* Henry E. Lowood, *Virtual Reality*, ENCYC. BRITANNICA, https://www.britannica.com/technology/virtual-reality [https://perma.cc/286B-NUQ4]. (last visited Apr. 19, 2017) (describing how museums might use augmented reality to enhance visitors' experience of their collections).

80. Flynn, *supra* note 67, at 354.

user commands, movement, and other inputs to create a sense of being present in an entirely different realm.[81] The experience is interactive because it enables the user to move herself and various objects in a virtual world with the aid of headsets, goggles, gloves, or other aids.[82] It is also "immersive" because it links one's visual, kinesthetic (physical), and auditory senses into a single experience, and because the experience changes according to the spectator's movement and position.[83] In contrast, in a traditional, spectator experience, there is no physical interactivity of the user's body, nor is there an interactive and literal intervention into the storyline because, at all times, the user retains a fixed sense of placement, given the seat or position of the user.[84] Further, scholars have written about how virtual reality can also be described in terms of (1) its speed, that is, its immediacy of response to user inputs; (2) its range, describing the comparably large number of attributes that the user can manipulate; and (3) its mapping abilities, referring to the types of media that can help the user interact with the mediated environment and how it connects to user inputs (for example, considering the different experience of manipulating a virtual environment with a mouse, as opposed to a set of gloves to interact with the virtual world).[85]

In a similar but slightly less extreme vein is augmented reality, which involves technology that adds some digital content to enhance our physical world experience. Augmented reality games—the game *Pokémon Go* being one example—link physical spaces and sensory experience with information, often inserting imagery into our physical spaces and augmenting our five senses.[86] For example, some companies have been experimenting with haptic technologies that augment a person's sense of touch, transforming touchscreens into "feel" screens that can mimic some particular types of textures.[87] Others aim to make sound waves visible into synthetic vision or enhance other senses like taste or smell.[88] The One World Heritage website uses augmented reality to project original paintings onto the walls of a Romanesque church after they had

81. *See* Nalbant & Bostan, *supra* note 79.

82. *See id.*

83. *See* Balides, *Immersion in the Virtual Ornament: Contemporary "Movie Ride" Films*, RETHINKING MEDIA CHANGE: THE AESTHETICS OF TRANSITION 315, 316–17 (David Thorburn & Henry Jenkins eds., 2003) (discussing Brenda Laurel's work on virtual reality and comparing it to other media).

84. Balides, *supra* note 64.

85. Nalbant & Bostan, *supra* note 79 (citing Jonathan Steuer, *Defining Virtual Reality: Dimensions Determining Telepresence*, 42 J. COMM. 73 (1992)).

86. *See* Brian D. Wassom, *IP in an Augmented Reality*, 6 LANDSLIDE 8, 10 (2014); *see also* Barry Joseph, *Augmented Wearables and the Future of Museums*, MOOSHA MOOSHA MOOSHME (Mar. 5, 2015), http://www.mooshme.org/2015/03/augmented-wearables-and-the-future-of-museums [https://perma.cc/HR5T-C5BR] (describing how museums might use augmented reality to enhance visitors' experience of their collections).

87. Wassom, *supra* note 86, at 10.

88. *Id.*

previously been moved into a museum, thereby "returning" the site to its original display.[89]

Other examples of virtual and augmented reality in museums include:

- The Art++ app at the Cantor Arts Center at Stanford augments artworks with a "digital halo" of information.[90]
- The Courtauld Gallery in London, the DeYoung Museum in San Francisco, and others use *WoofbertVR*, an app that museums and technologists from Facebook and Samsung developed to profile collections around the world.[91]
- The artist Jon Rafman used virtual reality in a sculpture garden for the Oculus Rift, among other projects.[92]
- The Natural History Museum in London created a virtual reality film, *First Life*, which recreates the ocean as it was five hundred million years ago.[93]
- The United Nations commissioned film director Chris Milk to produce a virtual reality film, *Clouds Over Sidra*, about the daily life of a preteen, Syrian refugee in Jordan.[94]
- Visitors to the Metropolitan Museum of Art in New York can use virtual reality goggles to see Jackson Pollock's *Autumn Rhythm (Number 3)* up close, enabling them to see floating splatters of paint. The Metropolitan Museum has also produced a spherical 360 video, *The Temple of Dendur*, using virtual reality technology.[95]
- Google Cultural Institute collaborated with eight museums to make paintings by Pieter Bruegel available online in virtual

89. *See* Albert Sierra et al., *#Taull1123: Immersive Experience in a World Heritage Site (Or Augmented Reality Without Devices)*, MW2015: MUSEUMS AND THE WEB 2015 (Jan. 31, 2015), http://mw2015.museumsandtheweb.com/paper/taull1123-immersive-experience-in-a-world-heritage-site-or-augmented-reality-without-devices [https://perma.cc/C87P-YA88].

90. AM. ALL. OF MUSEUMS, ME/WE/HERE/THERE: MUSEUMS AND THE MATRIX OF PLACE-BASED AUGMENTED DEVICES, TRENDSWATCH 23, 26 (2016).

91. *Id.*

92. *See* Ben Luke, *Welcome to the Virtual World*, ART NEWSPAPER (Jan. 2016), http://theartnewspaper.com/features/welcome-to-the-virtual-world [https://perma.cc/L5LB-ZUB6].

93. *See* Ellen Gamerman, *A Look at the Museum of the Future*, WALL ST. J (Oct. 16, 2015), https://www.wsj.com/articles/a-look-at-the-museum-of-the-future-1444940447 [https://perma.cc/2QS8-P29F].

94. *See* Luke, *supra* note 92. The piece was not free from controversy, prompting one critic to note, "Is VR the appropriate way to engage sympathy for child refugees or are child refugees the appropriate content to expand the market for VR?" Janet H. Murray, *Refugee Crisis in Virtual Reality*, INVENTING THE MEDIUM (Nov. 9, 2015), https://inventingthemedium.com/2015/11/09/refugee-crisis-in-virtual-reality [https://perma.cc/F6X8-WWSP].

95. *See* Gamerman, *supra* note 93; Nina Diamond, *The Temple of Dendur: From the Nile to NYC in 360°*, METRO. MUSEUM OF ART (Jun. 6, 2016), http://www.metmuseum.org/blogs/digital-underground/2016/facebook-360-temple-of-dendur [https://perma.cc/WF6X-FUEZ].

reality through the use of Google Box.[96]

As in extractive models, virtual reality allows for nonlinear information retrieval that can produce a more democratized space in which visitors select and consume information. Jaron Lanier has argued that virtual reality heralds an age of "post-symbolic communication" because it enables people to communicate by "directly creating the objective world instead of using symbols to refer to it."[97]

Yet, virtual reality is not just about mimicking the actual world or replicating it; it is also about creating an imaginative world that has little to do with physical reality.[98] Here is where proprietary claims begin to emerge. In dematerialized spaces like virtual reality, audiences can (almost) escape from reality by transporting themselves from a physical space to a space that might appear unpredictable and uncontrolled but is actually a very tightly controlled and managed experience.[99]

In fact, it is the illusion of user-created virtuality that is perhaps the most fascinating proprietary aspect of an immersive model. Indeed, far from being an egalitarian space created by its users, every aspect of virtual reality is governed entirely by the code that the company created. The user may interact with the virtual or augmented reality in which she is immersed, but her entire interactive experience—every angle she chooses to view, every movement she engages in, everything she sees, touches, or smells—is a product of predictive design. As Peter Lunenfeld explains, "[t]he interactivity of VR is not as polyvalent as it would appear to be because the virtual environments users immerse themselves in are created by others. Users immersing themselves in virtual worlds are more like visitors to a theme park, choosing between a limited number of prefabricated rides, than urbanites wandering the streets of the city. . . ."[100] Augmented realities, in contrast, might allow for a slightly greater degree of unpredictability due to user choice and external context. But here, too, a great deal depends on the design of the augmentation and how it actually adds to the user's everyday experience.

Since someone must create every aspect of virtual and augmented reality, that labor implies ownership of its fruits. The predictive design of virtual and augmented realities thus translates directly to a presumption of ownership, meaning some aspect of intellectual property (i.e. patents, copyrights, trademarks, and trade secrets) arguably governs nearly every aspect of the user's experience. Because the view, the gaze, the smell, and the objects touched are

96. *Bruegel: Unseen Masterpieces*, GOOGLE CULTURAL INST., https://www.google.com/culturalinstitute/bruegel [https://perma.cc/2QXE-P2CG].

97. Wendy J. Gordon et al., *Virtual Reality, Appropriation, and Property Rights in Art: A Roundtable Discussion*, 13 CARDOZO ARTS & ENT. L.J. 91, 92 (1994) (quoting noted philosopher of technology Jaron Lanier).

98. *Id.* at 93.

99. *See* Angelina Russo & Jerry Watkins, *Digital Cultural Communication: Audience and Remediation*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 11, at 149, 157.

100. Lunenfeld, *supra* note 35, at 7.

essentially designed and created by someone else, a host of legal challenges arises, which I discuss at greater length in Part II.

C. A Derivative Model of Interactivity

Today, 3-D printing technologies have offered an unparalleled level of user engagement in the museum context, allowing users to essentially edit and personalize their creations, offering new possibilities of imagination and fantasy.[101] Scanning, editing, and printing technology enables individuals to essentially erase the difference between a digital object and a physical one: the technology can capture real-life objects in great detail, store them as 3-D files, enable the user to alter them as desired, and then print them into actual, tangible forms.[102] The shift moves from cultural consumption of objects, which we observed in the extractive and immersive models, to user-generated production.[103] By allowing the viewer/consumer to become the artist, these projects enable new forms of 3-D production and to build new collective communities who can share resources and design museum-related projects.[104]

Unlike an "extractive" model of interactivity, which simply collects information for the user to select and retrieve as needed, a "derivative" model offers more possibilities for user agency through creative digital manipulation. I use the term "derivative" to describe works generated from preexisting artworks that recast, transform, or adapt an original, preexisting work into a new context.[105] A user can scan a particular work, download its digital file, and use it to create new images or tangible objects with a 3-D printer. All a potential creator—amateur or professional—needs is a scanner and a 3-D printer.

Using the right tools, artworks can be digitized, manipulated, recreated, and recoded in new and interesting ways, raising opportunities for both critical and commercial collaboration. Today, museums host hackathons, maker spaces, startup incubators, innovation labs, and other participatory activities to encourage collaboration.[106] Michael Weinberg, who works at Shapeways, has

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101. For a discussion of 3-D printing's potential role in the museum, see the special issue published by the International Foundation for Art Research, (IFAR) titled 3-D Printing, Infinite Possibilities and New Challenges for the Art World 15 IFAR Journal (2014).

102. *See* Sarah Younan, *Poaching Museum Collections Using Digital 3D Technologies*, 7 CITAR J. 25, 28 (2015); *see also* Sarah Younan & Cathy Treadaway, *Digital 3D models of heritage artifacts: towards a digital dream space*, 2 DIGITAL APPLICATIONS IN ARCHAEOLOGY & CULTURAL HERITAGE 240, 246–47 (2015).

103. Ross Parry & Nadia Arbach, *Localized, Personalized, and Constructivist: A Space for Online Museum Learning*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 11, at 281, 287.

104. *See* Younan, *supra* note 102, at 30.

105. Carpenter, *supra* note 18, at 491.

106. *See* Desi Gonzalez, *Museum Making: Creating with Emerging Technologies in Art Museums*, MW2015: MUSEUMS AND THE WEB 2015 (Feb. 1, 2015), http://mw2015.museumsandtheweb.com/paper/museum-making-creating-with-emerging-technologies-in-art-museums [https://perma.cc/4PBG-8C76]; *see also* Sara Bailey Hogarty et al., *Art + Data: Building the SFMOMA Collection API*, MW2015: MUSEUMS AND THE WEB 2015 (Jan. 30,

argued that 3-D printing is a "democratizing" technology that promises to "make the creation of physical objects nearly as widespread as the creation of copyright-protectable works."[107] As Mark Lemley has pointed out, 3-D printing has facilitated a move away from a world characterized by scarcity to a world characterized by abundance.[108]

Previously, copying technology was so underdeveloped that it was easier to tell the difference between a reproduction and the original. Now, the differences are not quite so obvious. 3-D technology is so advanced that it enables a creator to obtain incredibly precise and detailed information about an object—a perfect copy. While most 3-D technologies use "an additive process that builds an object layer by layer," others use a "subtractive manufacturing that carves [the] object from a solid substance."[109] Some 3-D technologies can discern an object's detail with light waves, which reduces the need for physical contact with the object itself.[110] Because the technology allows for minimal physical contact with the actual object, antiquities can be safely preserved and yet documented with precision. Further, since only a small percentage of a museum's collection may be available to the public at any one time, museums can now print high quality replicas for additional viewing at another site.[111]

Many, many museums and institutions have rapidly embraced the promise of 3-D printing:

- In 2009, the Smithsonian decided to scan and digitize its collection of over 137 million objects in 3-D, including an ancient Cosmic Buddha sculpture, a rare orchid, and a series of modern art installations.[112]
- The Skulpturhalle Basel Museum in Basel had a 3-D printing expert digitize its collection of high-quality plaster casts of Greek and Roman sculptures in order to make the digital files available for anyone to use on the Web.[113] Other museums have also opted to digitize their collections in order to encourage others to view, 3-D print, and remix their collections on their

2015), http://mw2015.museumsandtheweb.com/paper/art-data-building-the-sfmoma-collection-api [https://perma.cc/MJH6-G7F2] (outlining a range of participatory initiatives, such as an Art + Data day).

107. MICHAEL WEINBERG, PUB. KNOWLEDGE, IT WILL BE AWESOME IF THEY DON'T SCREW IT UP: 3D PRINTING, INTELLECTUAL PROPERTY, AND THE FIGHT OVER THE NEXT GREAT DISRUPTIVE TECHNOLOGY 5 (2010), https://www.publicknowledge.org/files/docs/3DPrintingPaperPublicKnowledge.pdf [https://perma.cc/XCR6-H3Y7].

108. *See* Mark A. Lemley, *IP in a World Without Scarcity*, 90 N.Y.U. L. REV. 460, 460–61 (2015); *see also* Deven R. Desai, *The New Steam: On Digitization, Decentralization, and Disruption*, 65 HASTINGS L.J. 1469 (2014) (discussing a shift towards localized production).

109. Cronin, *supra* note 10, at 29.

110. *Id.*

111. Lucas S. Osborn, *Of PhDs, Pirates, and the Public: Three-Dimensional Printing Technology and the Arts*, 1 TEX. A&M L. REV. 811, 820 (2014).

112. *See id.* at 819; *X 3D*, SMITHSONIAN, http://3d.si.edu [https://perma.cc/M89W-MWUZ].

113. Osborn, *supra* note 111, at 820.

own.[114]

- The Asian Art Museum in San Francisco has held "scanathons" where they invite members of the public to use their cameras to photograph objects from different angles. The photos are then fed into 123D Catch, a computer program that uses the crowd-sourced photos to build a 3-D model of the object, enabling others to 3-D print the scans.[115] In fact, someone created an iPhone case from an ancient work using the scanning technology.[116]
- The Smithsonian also created a full-size replica of a statue of Thomas Jefferson for an exhibition at the National Museum of African American History and Culture due to safety concerns about transporting the original.[117]
- The British Museum and the Samsung Digital Discovery Center in London created *Ancient Lives*, a 'new discoveries' exhibit that offered a 3-D printing weekend, enabling visitors to create their models from the collection.[118]
- The Art Institute of Chicago has made thirty-four items from its collection available for 3-D printing on Thingiverse.[119]

Other 3-D projects are underway at the Intrepid Sea, Air & Space Museum, the American Museum of Natural History, the Florida Science Museum, the Field Museum, the Hirshhorn Museum and Sculpture Garden, and the London Science Museum, among others.[120]

In contrast to the two models already put forth, 3-D printing enables users to design and to create their own works using certain technological tools. Here, the degree of interactivity is much greater because the user has the ability to decide what to scan, how to scan it, and whether to manipulate and add elements of her own choosing to the object. I call this model "derivative" largely because it is not only based on an existing item, but it also offers new, creative elements to the resulting creation. As one author described, "[w]hile this new content was often inspired by or in some form related to the aesthetic and cultural

114. *Id.* at 821.
115. *Id.*
116. *Id.*
117. *Id.*
118. *Press Release, Ancient Lives New Discoveries*, BRITISH MUSEUM (May 22, 2014), https://www.britishmuseum.org/about_us/news_and_press/press_releases/2014/ancient_lives,_new_discoveries.aspx [https://perma.cc/9HMC-GUMT].
119. *Art Institute of Chicago: About*, THINGIVERSE, https://www.thingiverse.com/ArtInstituteChicago/about [https://perma.cc/N9DU-T5CP]; Daniel Terdiman, *Smithsonian Turns to 3D to Bring Collection to the World*, CNET (Feb. 24, 2012), https://www.cnet.com/news/smithsonian-turns-to-3d-to-bring-collection-to-the-world [https://perma.cc/3WHK-AN2P].
120. Megan Hancock, *Museums and 3D Printing: More Than a Workshop Novelty, Connecting to Collections and the Classroom*, 42 BULL. ASS'N INFO. SCI. & TECH. 32, 35 (2015).

characteristics of the original artefacts, the digital artworks strayed far from their institutional interpretations."[121]

Many of these projects are deeply transformative in nature. The artist Oliver Laric has engaged in a variety of projects relating to 3-D scans, including one where he 3-D scanned the Lincoln Museum's collection and published all of the data on the web without restriction.[122] The project website includes a portal that enables the public to share their resulting works with the public. In response, another artist, Matthew Williamson, recreated a nineteenth-century bronze bust described as "an undulating purple GIF with an unearthly patina."[123]

In addition, the replication of these items of cultural heritage—when coupled with new technology—is priceless in its possibilities for preservation. For example, Morehshin Allahyari, a new media artist, relies on 3-D printing to reconstruct artifacts destroyed by ISIS, noting both its archival uses as well as its potential as a "tool for resistance, documentation and as a process for repairing history and memory."[124] Unlike other 3-D reproductions, however, the artist includes a flash drive and memory card inside each entity that records the original images and location of the original artifact, and instructions to future generations on how to access the memory drives without harming the objects themselves.[125]

In many ways, the derivative model offers the most complex set of legal challenges due to the nature of what is being (re)created. Although the 3-D movement is often intimately linked to the free culture and digital maker movements of today, it is also subject to a wide degree of legal controversy due to its commercial potential and legal uncertainties.[126] Here, the sophistication of 3-D printing might also be its greatest challenge because it forces us to separate the value of the design of an object from the comparably lesser value of the material on which it is printed. As Charles Cronin explains, "In the digital age it is increasingly true that the economic and aesthetic value of a cultural artifact is generated more by the information it contains than by the substance in which it is embodied"—in other words, its intellectual property.[127] Put simply, a marble carving is far more valuable because of the design aesthetics of the carving itself,

121. *See* Younan, *supra* note 102, at 29.

122. *See id.* at 27; Oliver Laric, LINCOLN 3D SCANS, http://lincoln3dscans.co.uk [https://perma.cc/N3FZ-JM92].

123. *Oliver Laric: Lincoln 3D Scans*, NEW MUSEUM (Jan. 9, 2014), http://www.newmuseum.org/exhibitions/view/oliver-laric-lincoln-3d-scans-1 [https://perma.cc/24HG-U5FK].

124. *See* Davide Sher, *Iranian-American "Additivist" Recreates ISIS Destroyed Artifacts with 3D Printing*, 3D PRINTING INDUS. (Jan. 12, 2016), https://3dprintingindustry.com/news/iranian-us-based-artist-and-additivist-recreates-isis-destroyed-artefacts-with-3d-printing-64692 [https://perma.cc/7TBX-ERCH].

125. *See id.*

126. *See* Younan, *supra* note 102, at 30.

127. *See* Cronin, *supra* note 10, at 20.

not because of the marble upon which it is carved.[128] As a result, 3-D printing creates incentives for intellectual property owners to become even more zealous in defending their creations, despite the current, uncertain state of the law governing 3-D printing. As I discuss further in Part II, whereas the extractive and immersive models of interactivity can be characterized by a clearer-cut set of presumptions associated with ownership of both the tangible and intangible of each model, the derivative model is far more complicated, leading to a knotty set of potential legal challenges.

II.
FROM ARTIFACTS TO IMAGES

In a famous essay entitled *The Work of Art in the Age of Mechanical Reproduction*, Walter Benjamin observed, "[e]ven the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be," which he described as the "aura" of the original.[129] As Benjamin observed, mechanical reproduction challenges the dominance of the aura, but, at the same time, the power of technology makes it possible to democratize access to works of art since others can view a replica instead of the original.[130]

This tension, therefore, between the reproduction and the original produces a number of underexplored issues for legal scholars who work on copyright law and the museum. I would argue that the models of interactivity discussed in Part I produce a central conflict between the authenticity of the original, as Benjamin suggested, and public access. The more we reproduce artifacts and images, the more accessible they become to the public. However, if works become more accessible to the public, what effect does that have on the original and its copy? If 3-D printing makes it incredibly easy to replicate, then how should we value an original? In other words, how much should authenticity and provenance matter in an age of mass digitization—more, or less?[131] As Charles Cronin wrote, "If human eyes cannot distinguish, for instance, between the Getty's 'Victorious Athlete' and a bronze copy of it, why should we place greater value on the earlier object simply because it was submerged in the Aegean Sea for 2000 years?"[132] These central tensions, I would argue, are at play in the very different legal

128. *See id.*

129. *See id.* at 21 (quoting and discussing Benjamin).

130. *See* Michael Rimock, *An Introduction to the Intellectual Property Law Implications of 3D Printing*, 13 CAN. J.L. & TECH. 1, 11 (mentioning Benjamin); *see also* Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction* (Hannah Arendt ed., Harry Zohn trans., 1969) (1936), https://www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm [https://perma.cc/897R-XGJ6].

131. *See* Griselda Murray Brown, *Art in the Age of Digital Reproduction*, FIN. TIMES (May 20, 2016), https://www.ft.com/content/74ffab6e-1b55-11e6-b286-cddde55ca122 (discussing exhibit by the Victoria and Albert Museum, titled "A World of Fragile Parts," which raised questions about the value of reproduction).

132. Cronin, *supra* note 10, at 23.

regimes that govern cultural and intellectual property—and they are also implicated in the copyright regimes that have emerged to govern the museum.

In this Part, I argue that technoheritage implicates legal issues of access, ownership, and authenticity. As soon as technologies like virtual or augmented reality or 3-D printing enter the picture, so does the legal ability to control cultural heritage objects through principles of property law, which is like trying to fit a square peg into a round hole. Amy and Christopher Blackwell have charged that the problem is attributable to our culture of "hyper-ownership," which they describe as the perception that "seemingly everything is subject to being owned by someone."[133] Every time someone makes a copy of something, whether through a photograph or a 3-D printer, they (often unwittingly) bring in intellectual property law to regulate their creations. And while we normally think of this area of law as a good thing for artists (as it helps them both profit from and recoup for the cost of their creations), it can also be a bad thing for the public who might want access to their goods, particularly if the rights to those objects have long been expired.

In many ways, this central tension underscores the paradox that museums face today. By digitizing their collections, museums are able to offer a wider degree of user interactivity and reach wider markets, but at the same time, the trend towards reproduction and simulation seems to challenge one of the very purposes for why museums exist—to collect, authenticate, and conserve original items of cultural heritage.[134] Theorist Jean Baudrillard, for example, has noted that if virtual reproductions are marketed as if they were equivalent to the original, viewers will become unable to tell the difference between them and reduce everything to information and images, leading to a "semiotically self-referring existence."[135] Similarly, architectural critic Ada Louise Huxtable argued that a culture of reproduction imposes information costs to society, including a lack of critical judgment, an inability to distinguish between the real and its simulation, and an erosion of the values of connoisseurship and authenticity of the original.[136] For her, there is a need to retain a sharp distinction

133. Amy Hackney Blackwell & Christopher William Blackwell, *Hijacking Shared Heritage: Cultural Artifacts and Intellectual Property Rights*, 13 CHI.-KENT J. INTELL. PROP. 137, 137–38 (2014), *quoted in* Charles Cronin, *Possession is 99% of the Law: 3D Printing, Public Domain Cultural Artifacts and Copyright*, 17 MINN. J.L. SCI. & TECH. 709, 736 (2016).

134. Laurence Tribe expressed a very similar concern over reproduction and its impact on society in his famous work, *Ways Not to Think About Plastic Trees: New Foundations for Environmental Law*, when he responded to an article that appeared in *Science* suggesting that fake plastic trees might provide adequate substitution for the real thing. 83 YALE L.J. 1315 (1974); *see also* Daniel A. Farber, *From Plastic Trees to Arrow's Theorem*, 1986 U. ILL. L. REV. 337 (1986) (commenting on Tribe). I thank Sarah Schindler for this discussion.

135. *See* Fiona Cameron, *Beyond the Cult of the Replicant*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 11, at 51 (comparing Baudrillard's view of reproduction to Benjamin and ultimately Crimp).

136. *See* ADA LOUISE HUXTABLE, THE UNREAL AMERICA: ARCHITECTURE AND ILLUSION (1997). On the information costs of Huxtable's "authentic reproductions," see Laura A. Heymann, *Dialogues of Authenticity*, 58 STUD. L. POL. & SOC'Y 25, 41, 47 (2015).

between the original and the reproduction, and museums and other similar institutions should regard themselves as "defenders and keepers of authenticity" instead.[137] In other words, reproduction arguably produces a false value, something that can be commercialized, which in turn can dilute the curatorial and authenticating skills of the museum professional.[138]

A. Cultural Property vs. Intellectual Property

Tangible cultural heritage gives rise to both economic and noneconomic values, which are often in tension with one another. The economic values translate to market principles, but the noneconomic values are more inclined towards cultural, spiritual, historical, or social values that are decidedly hard to quantify or measure.[139] This has led economists to conclude that cultural heritage goods tend not to perform like other assets in the marketplace, owing to their public character and their characterization as merit goods.[140]

The complexity of the relationship between cultural and intellectual property also plays out in the context of international and common law. According to the Hague Convention, the UN document that governs cultural property, cultural property is an umbrella term to denote both "movable" and "immovable" property.[141] It carries "great importance to the cultural heritage of every people," like monuments, archaeological sites, and buildings of historical or artistic interest, as well as works of art, literary creations, and scientific collections.[142]

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137. *See* Balides, *supra* note 64 (discussing Huxtable).

138. *See id.*; *see also The Nefertiti 3D Scan Heist Is a Hoax*, COSMO WENMAN (Mar. 8, 2016), https://cosmowenman.wordpress.com/2016/03/08/the-nefertiti-3d-scan-heist-is-a-hoax [https://perma.cc/AD7C-MC2J] (noting that digitization "radically increases the importance of provenance—where artifacts and information come from, who controlled it, and who edited it").

139. *See* Ingeborg Matecic, *The Influence of Tangible Cultural Heritage on the Economic Sustainability of a Tourism Destination*, *in* HERITAGE TOURISM & HOSPITALITY INT'L CONF. 2015, at 139 (2015); Ingeborg Matecic, *Specific Characteristics of the Tangible Cultural Heritage Valuation Process in Tourism*, 28 ACTA TURISTICA 73, 73 (2016).

140. *See supra* note 139.

141. Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict art. 1(a), May 14, 1954, S. TREATY DOC. NO. 106-1 (1999), 249 U.N.T.S. 240.

142. *Id.* For more writings on cultural property, see Alexander A. Bauer, *New Ways of Thinking About Cultural Property: A Critical Appraisal of the Antiquities Trade Debates*, 31 FORDHAM INT'L L.J. 690, 693–94 (2008); Kristen A. Carpenter, Sonia K. Katyal & Angela R. Riley, *In Defense of Property*, 118 YALE L.J. 1022, 1048 (2009); Cronin, *supra* note 10, at 12; Derek Fincham, *The Distinctiveness of Property and Heritage*, 115 PENN. ST. L. REV. 641 (2011); Patty Gerstenblith, *Identity and Cultural Property: The Protection of Cultural Property in the United States*, 75 B.U. L. REV. 559, 567 (1995); Sarah Harding, *Defining Traditional Knowledge—Lessons from Cultural Property*, 11 CARDOZO J. INT'L & COMP. L. 511 (2003); Sarah Harding, *Justifying Repatriation of Native American Cultural Property*, 72 IND. L.J. 723, 759 (1997); Lyndel V. Prott & Patrick J. O'Keefe, *"Cultural Heritage" or "Cultural Property"?*, 1 INT'L J. CULTURAL PROP. 307, 311 (1992); Steven Wilf, *What Is Property's Fourth Estate? Cultural Property and the Fiduciary Ideal*, 16 CONN. J. INT'L L. 177 (2001). For some skeptical views, see Naomi Mezey, Essay, *The Paradoxes of Cultural Property*, 107 COLUM. L. REV. 2004 (2007); Eric A. Posner, *The International Protection of Cultural Property: Some Skeptical Observations*, 8 CHI. J. INT'L L. 213, 222 (2007).

Because the term is so broad and encompasses all sorts of facets—property and identity—cultural property has given rise to a string of modern day conflicts when it becomes recast into intellectual property. Here, all of the same issues that we see in every other context regarding the intersection of copyright and technology resurface, but the failure to recognize the distinct differences between cultural and intellectual property can often lead to problematic results.

In the traditional context, cultural antiquities are mostly tangible things, in contrast to intellectual properties, which are nonrivalrous by nature. This means that more than one person can enjoy an intellectual good without interfering with another person's use of that good. Moreover, as Charles Cronin points out, when we use the term "cultural property," we anthropomorphize objects, suggesting that not only do these objects have a specific homeland, but that "they [also] have an innate yearning to be located within a particular locus and culture."[143] James Cuno, the CEO of the J. Paul Getty Trust, echoed this view, referring to the "stubbornness of objects," noting, "It's not the same with music, it's not the same with film, it's not the same with literature—but when it comes to physical objects, these things are kept as evidence of a proud past, as defined by the nation-state government."[144]

Different motivations lie behind the protection of intellectual properties versus cultural properties. As Cuno suggested, unlike intellectual properties, cultural properties are usually meaningful to a specific group, tribe, or nation, not just to a single author or creator.[145] The late John Henry Merryman, the world's most prominent cultural property theorist, has argued that the twin elements of cultural property policy focus on access and preservation.[146] As Peter Yu has explained, cultural property laws are usually motivated by a desire to retain, repatriate, preserve, protect, and authenticate tangible artifacts of cultural heritage.[147] In contrast, the guiding focus of intellectual property involves an almost singular focus on profit from replication, involving the control of commercial exploitation, reproduction, and distribution.[148] Moreover, intellectual property laws are also limited, in part, by a recognition of the need to preserve "building blocks" of raw materials for future creators.[149] That is why

143. Cronin, *supra* note 10, at 6.

144. *Id.* at 5 (quoting James Cuno, President of the Getty Trust, *in* Rachel Donadio, *Vision of Home: Repatriated Works Back in Their Country of Origin*, N.Y. TIMES (Apr. 20, 2014), https://www.nytimes.com/2014/04/20/arts/design/repatriated-works-back-in-their-countries-of-origin.html [https://perma.cc/4FC5-EPQC]).

145. *Id.*

146. *See* John Henry Merryman, *Two Ways of Thinking about Cultural Property*, 80 AM. J. INT'L L. 831, 837 (1986); Pessach, *supra* note 40, at 259.

147. *See* Peter K. Yu, *Cultural Relics, Intellectual Property, and Intangible Heritage*, 81 TEMP. L. REV. 433, 447 (2008).

148. *See id.*

149. *See id.* at 449.

we have affirmative defenses, like fair use, to avoid impoverishing the public domain and allow for remixing and appropriation.[150]

These differences between cultural and intellectual property have led some commentators to conclude that copyright is a fairly insufficient mechanism to address the complexities of digital cultural preservation and heritage. To take one example, the project of digital cultural preservation requires large-scale reproductions of entire copyrighted works, something that copyright law is not designed to enable or regulate.[151] Since the default rule of copyright is premised on the belief that the market is the appropriate infrastructure for the production and distribution of cultural goods, cultural preservation is usually considered to be outside of its parameters.[152] Further, within this scheme, copyright law tends to underestimate the importance of the public domain, in addition to other nonmarket values like historical veracity, open access, or collective identity.[153]

Digitizing and replicating cultural properties, however, converts them into intellectual property, opening up a host of possibilities for further restriction. Even when a museum does not assert copyright control over a work, the museum might try to extend control over the work through negotiating particular contract terms, imposing licensing restrictions, or making claims of property ownership over the work, as I discuss further below.[154]

B. Copyright Control in Two Dimensions

The tensions between access, control, and the public interest parallel the tensions between a museum's identity as a self-interested, rent-seeking institution and its obligations to the public interest.[155] Although this tension might seem abstract at first glance, these issues emerge more concretely in the doctrinal terrain of copyright law. One central area of tension with digitization involves the degree of copyright protection that attaches to photographs and reproductions of artwork that are then circulated to the public. While an original photograph or painting might have copyright protection depending on the year of its creation, a photograph of an artwork is far less likely to be protectable. Yet many museums continue to assert copyright control over their images, even when it is inappropriate to do so under existing law.[156]

In 1865, Congress amended the Copyright Act to include "photographers" as "authors" for the purposes of the constitutional guarantee of protection to

150. *See id.* at 451.
151. *See* Pessach, *supra* note 40, at 281.
152. *See id.*
153. *See id.*
154. *See* Kenneth D. Crews, *Museum Policies and Art Images: Conflicting Objectives and Copyright Overreaching*, 22 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 795, 806 (2012).
155. *See id.* at 797.
156. *Id.*

"Authors and Inventors."[157] Later, the Supreme Court echoed this view, holding that photography could represent the "original intellectual conceptions of [an] author."[158] At the same time, there is also a perception that photographs lack originality when "a photograph of a photograph or other printed matter is made that amounts to nothing more than a slavish copying."[159]

The distinction between a copyrightable photograph and an uncopyrightable one is hard to parse, however. Scholars and commentators have argued this distinction can be flawed and can lead to a great deal of inconsistency.[160] If the law requires a showing of creativity for copyright protection, for example, then why does copyright attach to all manner of unstaged photography, as in photographs of nature?[161] Kevin Garnett, one commentator, added, "what is the distinction between a photographer who by his skill portrays as realistically as possible a scene from nature and one who by his skill and labour reproduces a painting as realistically as possible?"[162] A second issue involves photographs of 2-D reproductions (which have not been protected under copyright unless they show the some degree of creativity), in comparison to photographs of 3-D reproductions, which have traditionally received copyright protection under the presumption that the standard for creativity has been met.[163] Consider this anomaly as applied to the public domain. Why would the law refuse to protect photographs of public domain 2-D paintings or photographs, but opt to protect photographs of public domain sculptures? Photographing surely requires a similar degree of care and skill, commentators argue.[164]

Moreover, copyright law has always been a traditionally limited system; its architecture includes checks to avoid stifling future creations, with a great deal of room for secondary uses by other creators or commentators. As Kenneth Crews has pointed out, "not all rights apply to all works."[165] A copyright on a sound recording does not include the public performance right, for example.[166] Further, fair use creates limited exceptions and rights for secondary creators in cases of education, commentary, and transformative use, among other uses.[167]

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157. Robin J. Allan, Comment, *After* Bridgeman*: Copyright, Museums, and Public Domain Works of Art*, 155 U. PA. L. REV. 961, 971 (2007) (citing Act of Mar. 3, 1865, ch. 126, 13 Stat. 540).

158. Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 58 (1884).

159. Bridgeman Art Library, Ltd. v. Corel Corp., 36 F. Supp. 2d 191 (S.D.N.Y. 1999) (quoting 1 MELVILLE F. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 2.08[E][1], at 2-131 (1999)).

160. Allan, *supra* note 157, at 971–72.

161. *See id.* at 972.

162. Kevin Garnett, Comment, *Copyright in Photographs*, 22 EUR. INTELL. PROP. REV. 229, 237 (2000).

163. Allan, *supra* note 157, at 978.

164. *Id.*

165. Crews, *supra* note 154, at 801.

166. *Id.* at 800.

167. *See* Copyright Act of 1976, 17 U.S.C. § 107 (2012); Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 578 (1994).

Time further limits copyright to a precise number of years after an artists' death before it falls into the public domain.[168] This means that copyright protects all of the work by recent artists like Andy Warhol or Roy Lichtenstein, but perhaps not all of Pablo Picasso's earlier works.[169] And, of course, works from artists like Rembrandt or da Vinci are firmly in the public domain and therefore lack copyright protection entirely.[170]

Antiquities, by definition, are too old to be copyrightable. Thus, they are in the public domain. But the images of these artworks might be protectable upon a proper showing of creativity and transformation.[171] As Charles Cronin put it, the more human creativity that can be shown in the making of the copy, the more likely it is copyrightable.[172] On the other hand, the more the copy is produced through mechanical devices such as a photocopier, the less likely it contains copyrightable elements for protection.[173] "In fact," Cronin wrote, "the more accurate the restoration, the more likely the work will manifest nothing other than the expression of the original creator, long in the public domain."[174]

Consider the case of *Bridgeman Art Library v. Corel Corp.* There, the court held that a photograph of a public domain painting did not warrant copyright law's protection.[175] The court found that "slavish" imitations of 2-D works lack the originality requirement from 17 U.S.C. § 102.[176] In *Bridgeman*, Corel sold a set of CD-ROMs that contained digital images of a set of works in the public domain, some of which were also in Bridgeman Art Library's high-quality transparency collection.[177] Bridgeman contracted with both freelance and museum photographers for use either in print publications or in a set of low-resolution images formatted in a CD-ROM collection.[178] Bridgeman argued that the only way Corel could have obtained the images was by digitizing its transparencies.[179] Before Bridgeman could win on its infringement case, however, it had to show that it held a valid copyright in the reproductions.[180]

The court concluded that copyright protection did not attach when "the point of the exercise was to reproduce the underlying works with absolute fidelity."[181] According to the court, the copies were "slavish copies of public

168. Crews, *supra* note 154, at 801.
169. *Id.* at 802.
170. *Id.*
171. *Id.* at 804.
172. Cronin, *supra* note 10, at 32.
173. *Id.* at 32.
174. *Id.* at 34.
175. Bridgeman Art Library, Ltd. v. Corel Corp. (*Bridgeman I*), 25 F. Supp. 2d 421 (S.D.N.Y. 1998); Bridgeman Art Library, Ltd. v. Corel Corp. (*Bridgeman II*), 36 F. Supp. 2d 191, 197 (S.D.N.Y. 1999).
176. *Bridgeman II*, 36 F. Supp. 2d at 197.
177. *Bridgeman I*, 25 F. Supp. 2d at 424.
178. *Id.*
179. Allan, *supra* note 157, at 966–67.
180. *Bridgeman I*, 25 F. Supp. 2d at 426.
181. *Bridgeman II*, 36 F. Supp. 2d at 197.

domain works of art," lacking any "spark of originality."[182] Even after reconsideration, the court ruled that, "[t]o be original, a work 'need not be original or new in form, but it must originate with the author and not be copied from another work.'"[183]

Evidence suggests, however, that most museums and art libraries simply ignore *Bridgeman*'s refusal to find originality in exact photographic reproductions of public domain images.[184] Instead, many institutions routinely assert that their reproductions are copyrightable, even when *Bridgeman* directs otherwise. Part of the reason may be because it is a district court opinion and thus of limited controlling precedent. Yet even though there is scant case law outside of *Bridgeman*, museums are notorious for overstating their copyright interests in items that are unprotectable. Jason Mazzone coined the term "copyfraud," to describe a phenomenon in which an owner asserts copyright protection over elements or creations that do not warrant protection in order to control access to an object.[185] In one very important study, Kenneth Crews examined the substantive conditions that fifty different museums imposed on the use of their art images and found evidence of copyright overreach.[186] Some museums presented the provisions as "terms of use" or "license agreements."[187] Here, museums often claimed they had the legal right to control images of artworks in their collections, even though existing law casts doubt on their claims and the underlying work is in the public domain.[188]

The phenomenon of "copyfraud" illustrates a structural limitation to the law's regulation because it suggests an outright willingness to ignore existing law. In fact, one author has observed that at least in Britain the Museums Copyright Group has concluded that the *Bridgeman* case had no relevance or influence over the ways that museums negotiated or licensed their rights to their collections.[189] In a similar case to *Bridgeman*, *National Portrait Gallery vs. Coetzee*, a graduate student at the University of California, Berkeley, Derrick Coetzee, wrote a script that essentially converted a series of low-resolution image tiles of thousands of works held by the National Portrait Gallery in London

182. *Id.*

183. *Bridgeman I*, 25 F. Supp. 2d at 426 (quoting Interlego AG v. Tyco Industries Inc., 3 All E.R. 949, 970 (1988)).

184. *See* Colin T. Cameron, *In Defiance of* Bridgeman*: Claiming Copyright in Photographic Reproductions of Public Domain Works*, 15 TEX. INTELL. PROP. L.J. 31, 47–48 (2006).

185. JASON MAZZONE, COPYFRAUD AND OTHER ABUSES OF INTELLECTUAL PROPERTY LAW (2011) (expanding on themes first outlined in Jason Mazzone, *Copyfraud*, 81 N.Y.U. L. REV. 1026, 1028 (2006)).

186. Crews, *supra* note 154, at 794.

187. *Id.* at 799–800.

188. *Id.* at 806.

189. *Copyright in Photographs of Works of Art*, MUSEUMS COPYRIGHT GRP., https://web.archive.org/web/20150503115921/http://museumscopyright.org.uk/resources/articles/bridgeman (last visited Jun. 26, 2016).

("NPG") into fully assembled, larger, high-resolution images.[190] Previously, the NPG had made its works publicly accessible by posting high-resolution files that showed only a portion of each work, but never displayed the entirety of the work in high resolution.[191] Coetzee then uploaded his files to a Wikimedia Commons repository.[192]

In response, the NPG claimed that the creation of the files and subsequent upload to the Web violated its copyrights in the images, as well as its database interests in the files. The case was never resolved, leaving the state of the law largely unclear.[193] These cases show that many entities continue to assert copyright protection to control access to these works, even when the scope of protection is limited. Museums, at times, threaten unauthorized users with lawsuits and damages, restrict access to cultural materials by making nonpublication a condition of access, and declare that they own all of the data and images outright.[194] Or, they may simply argue, as the Museum of Fine Arts does in Boston, that the "[i]mages are not simple reproductions of the works depicted and are protected by copyright."[195] These actions all plainly ignore *Bridgeman*'s holding.

Why would museums deliberately overstate the rights that the Copyright Act gives them over works in their collection? Crews offers several explanations: first, their websites' terms might be outdated, seldom updated, or interpreted to fall outside of *Bridgeman*'s purview.[196] Second, other interested parties, such as artists, photographers, or donors, might compel museums to limit reproductions and make more restrictive statements of copyright than a museum ordinarily would for images posted on a website.[197] Third, these restrictions go beyond copyright, but they are almost never directly challenged.[198] Consider a representative example. The Peabody Essex Museum allows users to purchase its images. Nevertheless, its terms impose significant restrictions on their use,

190. Fred von Lohmann, *EFF Defends Wikipedian's Right to the Public Domain*, ELEC. FRONTIER FOUND. (Aug. 3, 2009), https://www.eff.org/deeplinks/2009/07/eff-defends-wikipedi [https://perma.cc/CA6C-ZG2X]; *National Portrait Gallery v. Coetzee*, DIG. MEDIA LAW PROJECT (Aug. 11, 2009), http://www.dmlp.org/threats/national-portrait-gallery-v-coetzee [https://perma.cc/X6XD-KXLL].

191. Maev Kennedy, *Legal Row Over National Portrait Gallery Images Placed on Wikipedia*, GUARDIAN (July 14, 2009), https://www.theguardian.com/technology/2009/jul/14/national-portrait-gallery-wikipedia-row [https://perma.cc/3LKG-GLEJ].

192. *Id.*

193. Grischka Petri, *The Public Domain vs. The Museum: The Limits of Copyright and Reproductions of Two-Dimensional Works of Art*, 12 J. CONSERVATION & MUSEUM STUDS. 1, 1–2 (2014). This Article also does not address the phenomenon of moral rights. *See, e.g.*, Carpenter, *supra* note 18, at 485–87.

194. Cindy Alberts Carson, *Laser Bones: Copyright Issues Raised by the Use of Information Technology in Archaeology*, 10 HARV. J.L. & TECH. 281, 291 (1997).

195. Petri, *supra* note 193, at 3.

196. Crews, *supra* note 154, at 808–11.

197. *Id.*

198. *Id.*

thus preventing purchasers from reproducing the images, even when the pictured work is unquestionably in the public domain.[199] As Crews explains, a museum might not directly claim that copyright prohibits a use, but instead assert a restriction on subsequent uses that may be expected to trump copyright's limitations altogether.[200] Some museums, like the NPG in London, maintain a strict no-photograph policy for anything other than personal, noncommercial use on the grounds that any reproductions of their works must be by written permission only.[201]

Under a copyright regime, an owner might have a set of legal rights and responsibilities over the protected expression in the artwork, but it is the actual owner of the physical object itself—the tangible painting, sculpture, or artifact—who has the greater power to restrict access to the work itself.[202] Thus, even aside from copyright, many museums can use contract law and property ownership to augment their efforts to control access to an object.[203] "The museum can control access to the original artwork," Crews asserts, "by means as simple and as obvious as locking the front doors."[204]

In addition, a museum can decide how to photograph its own works, limiting certain kinds of technologies or activities from taking place in order to ensure that it maintains a monopoly power over the best techniques of reproduction available. In other words, a Picasso work might be in the public domain, but, as Crews points out, the very ability to reproduce images of that Picasso might depend on cooperation from the Picasso estate and from the Museum of Modern Art that retains ownership of the work.[205] Consequently, museums can condition access to their public domain works by requiring visitors to limit their use or distribution of materials that they create from those works.[206] Or they can refuse access to the work altogether by prohibiting photography and disallowing any copying of the material entirely.[207] Some courts, like the Seventh

199. *Id.* at 810–11.

200. *Id.* at 811.

201. Petri, *supra* note 193, at 9.

202. Crews, *supra* note 154, at 803.

203. For example, in another 2005 case, an amateur historian published a book entitled *Berkeley 1900*, which contained a number of photographs from the collection of the Berkeley Historical Society. The historian, Richard Schwartz, had signed a "one time use agreement" that had a five-year limitation on his right to reproduce. But he then filed a declaratory judgment action challenging the agreement on the grounds that the terms of use restriction was legally unenforceable since it involved works in the public domain. In response, the Berkeley Historical Society argued that its access restrictions were indeed enforceable. The case was dismissed, offering little precedential value in similar cases. *See* Stipulation of Dismissal with Prejudice and Order, Schwartz v. Berkeley Historical Soc'y, No. 3:05-cv-01551 JCS (N.D. Cal. Aug. 9, 2005) (dismissing claim with prejudice).

204. Crews, *supra* note 154, at 806.

205. *Id.* at 804.

206. *See* Simon J. Frankel, Of Copyright and Contract and Public Domain Materials, Presentation at the 72nd Ann. Meeting Soc'y Am. Archivists (Aug. 28, 2008), http://www.archivists.org/conference/sanfrancisco2008/docs/session101-frankel.pdf [https://perma.cc/J5YW-PM4R].

207. *See id.*

Circuit, have upheld contractual restrictions that tend to go "beyond" copyright's limitations on the grounds that contract rights only affect the parties within the contract, in contrast to copyright law, which affects the rights held by the public as a whole.[208] Even though the central case law on this point has been bitterly criticized by both courts and commentators,[209] it has empowered content providers to restrict the rights of their website users, garnering more rights for themselves than otherwise possible under a copyright regime.[210] Yet, these restrictions are only enforceable against the parties to the contract, and might be preempted by copyright law instead.[211]

All of this leads, however, to a dangerously overbroad perception of ownership. Individuals acquiring an image from a museum must usually agree to a set of restrictive controls that are often never challenged in court and therefore carry a perception of legal validity.[212] This leads, in part, to a view that incorrectly suggests that a museum can control downstream uses of that reproduction, even ones that might fall under fair use protection, not because the state of the law requires it, but because of the contractual obligations to which the user just agreed. As Crews explains, "an individual who acquires an image directly from a museum may in fact be contractually obligated to that museum and subject to any restrictive terms that the user accepted."[213] In exchange for access, a museum can demand that a user agree to more conditions and restrictions before they can view the work, let alone reproduce it.[214] Because the user needs access to the work, she often agrees to the terms presented.[215] And, in turn, the museum often articulates its restrictive terms in a manner that relates them directly to the organization's overall mission—for instance, as Crews describes, to acquire or protect the art's integrity, to ensure access to the work by the public, or to prevent uses that may otherwise detract from the work's preservation and/or promotion.[216] As examples, Crews points to statements from the Art Institute of Chicago and the Asia Society that observe that material on

208. Allan, *supra* note 157, at 987 (discussing ProCD, Inc. v. Zeidenberg, 86 F.3d 1447, 1455 (7th Cir. 1996)).

209. See Peter S. Menell & Ryan Vacca, 3D Printing and US Copyright Law, at 17 n.110 (unpublished manuscript) (draft on file with author) (comparing Vault Corp. v. Quaid Software Ltd., 847 F.2d 255 (5th Cir. 1988) with Davidson & Assocs. V. Jung, 422 F.3d 630 (8th Cir. 2005), Bowers v. Baystate Techs., 320 F.3d 1317 (Fed. Cir. 2003)), and MARGARET JANE RADIN, BOILERPLATE: THE FINE PRINT, VANISHING RIGHTS, AND THE RULE OF LAW (2013) (discussing the limits of contractual agreements).

210. Allan, *supra* note 157, at 988.

211. *See* Frankel, *supra* note 206, at 16–21 (citing *ProCD*, 86 F.3d at 1447; *Vault Corp.*, 847 F.2d at 255; *Bowers*, 320 F.3d at 1317); Allan, *supra* note 157, at 985 (arguing that contractual protection is less comprehensive because contract law might allow someone to purchase a reproduction from a museum store and copy it without permission, whereas a copyright regime would not allow these acts).

212. *See* Crews, *supra* note 154, at 807.

213. *Id.*

214. *Id.*

215. *Id.* at 808.

216. *Id.*

their web sites is protected by copyright, even when the material might not be protected under *Bridgeman*.[217]

As Crews valuably points out, there are several reasons why the law should consider the pecuniary and nonpecuniary interests that a museum may have in restricting access to images. First, many museums see themselves as "trustees" over the aesthetic integrity of a work.[218] Second, by issuing restrictions surrounding uses, museums can derive additional fees for subsequent uses by researchers and other consumers (especially regarding merchandising).[219] Third, museums desire some form of attribution for uses of their collections.[220] And fourth, at times, donors sometimes impose requirements themselves.[221] As Crews reports, "[m]useums should view donor restrictions as a price paid for the materials in question, and it is a price often borne by the public in the form of limited access or uses."[222] Because the rights, claims, and obligations associated with these agreements are entirely private agreements, museums often must accept these restrictions and pass them along to the user.[223] A final set of considerations also stems from museums' desire to ensure the identification and reputation of the artist by requiring some form of attribution.[224] In addition, this right of attribution, or "paternity right," stems from moral rights considerations that protect the right of an author or artist to be identified in connection with uses of a copyrighted work.[225] Consider Crews' discussion of the Georgia O'Keeffe Museum. It assures users that it will generously grant permission to use its works, especially if the request promotes O'Keeffe and awareness of her work.[226] While this policy seems liberal on its face, it might also implicitly suggest that the Museum will be more skeptical of uses that appear inconsistent with its mission or critical of O'Keeffe in some manner.[227]

A museum's ability, therefore, to disallow permission based on its own market and nonmarket concerns, stems in part from its presumption of proprietary control. As Crews argues, by appropriating works that have fallen into the public domain, museums effectively resurrect the work's copyright, extending the terms of copyright beyond their original limits.[228] In this way, museums privatize and impoverish the public domain, cementing a perpetual monopoly over the commercial reproduction of works, sometimes even publicly

217. *Id.* at 808–09.
218. *Id.* at 813.
219. *Id.*
220. *Id.* at 814.
221. *Id.*
222. *Id.* at 815.
223. *Id.*
224. *Id.* at 816.
225. *Id.*
226. *Id.* at 818.
227. *Id.*
228. *See* Petri, *supra* note 193, at 8 (discussing Crews, *supra* note 154, at 795).

owned ones.[229] A burden on the public domain, in turn, has negative consequences for the circulation of culture.[230] "The museum may very well be fulfilling a mission of preserving the integrity of existing art," Crews points out, "but it is not serving the public interest in the advancement of either art or the law."[231]

C. Copyright Control in Three Dimensions

Like the previous state of intellectual property in two dimensions, in the context of 3-D works, copyright generally attaches only to the underlying work, not to the image or photograph produced by scanning the work. Yet, copyright overreach in the 3-D context also continues to be a problem, largely due to the unclear state of the law. The more an item appears to be protectable at first glance, and the more desirable an object's reproduction may be, and the more likely that a museum or company might overstate its copyright interest in the original artwork, even when the underlying work is unprotectable. Here, museums routinely overstate the copyright interests in their scans or in the objects their scans produce, even when the objects are made by others and firmly in the public domain.[232]

That, of course, is not meant to suggest that 3-D printing does not implicate copyright law.[233] File-sharing websites for the exchange of 3-D scans, like Thingiverse, are often forced to take down their files for infringing content.[234] But something changes when questions of cultural antiquity enter the picture. Very often the work may be unprotected due to its placement in the public domain, and, as I discuss below, the 3-D scans themselves also often lack protection.

As we know, *Bridgeman* held that developing slides from paintings showed no originality because the photography was meant "to reproduce the underlying

229. *See id.* (citing SUSAN BIELSTEIN, PERMISSIONS: A SURVIVAL GUIDE 38 (2006) ("privatization of the public domain"); R. Anthony Reese, *Photographs of Public Domain Paintings: How, If At All, Should we Protect Them?*, 34 J. CORP. L. 1033 (2009) (describing how copyrights in photograph artificially extend copyrights over public domain artworks); Ronan Deazley, *Photographing Paintings in the Public Domain: A Response to Garnett*, 23 EUR. INTELL. PROP. REV. 179, 183 (2001) (a "*de facto* perpetual monopoly").

230. Crews, *supra* note 154, at 820.

231. *Id.*

232. *See generally id.* at 819–31 (outlining three different types of museum overreach: asserting rights in the public domain, asserting legal rights it does not hold, and asserting rights beyond those the Copyright Act grants).

233. For an excellent discussion, see Menell & Vacca, *supra* note 214; Deven R. Desai & Gerard N. Magliocca, *Patents, Meet Napster: 3D Printing and the Digitization of Things*, 102 GEO. L.J. 1691 (2014); Nora Freeman Engstrom, Essay, *3-D Printing and Product Liability: Identifying the Obstacles*, 162 U. PA. L. REV. ONLINE 35, 36 (2013); James Grimmelmann, *Indistinguishable from Magic: A Wizard's Guide to Copyright and 3D Printing*, 71 WASH. & LEE L. REV. 683, 696 (2014); Jasper L. Tran, *The Law and 3D Printing*, 31 J. MARSHALL J. INFO. TECH & PRIVACY L. 505 (2015).

234. Tesh W. Dagne, *The Left Shark, Thrones, Sculptures and Unprintable Triangle: 3D Printing and Its Intersections with IP*, 25 ALB. L.J. SCI. & TECH. 573, 583 (2015).

works with absolute fidelity."[235] Copyright law generally does not protect 3-D scans for the same reason, particularly those that are meant to accurately represent an object through a digital lens.[236] Because the scanner operates by making a digital representation of a physical object, it does not receive a copyright because it lacks the originality and creativity normally required for copyright law to attach. As Weinberg explains, copyright does not protect something simply because of the hard work involved in creating a work, but is designed to reward creativity.[237] The process of preparing, making, and processing the data from a scan tends not to be viewed as creative work, because it is designed primarily to "transfer a physical thing into a digital medium."[238] Although it may serve as foundational building blocks for creative work, it is not *itself* a creative work.[239]

Consequently, there is a general sense that copyright does not automatically protect 3-D scans. In one case involving Toyota's unauthorized use of a 3-D scan of an automobile model in an advertisement, a court found that the scans themselves were not copyrightable because their creators directed all of their skills and time toward replication alone.[240] In other words, since the scans involved only "mechanical reproduction," rather than "originality of thought," the scans did not deserve protection.[241] In another 3-D case involving train stations, a court was more willing to recognize some copyrightable content, because the 3-D models both manipulated the models and added new elements to them, thereby satisfying the requirement for a "spark" of original expression.[242]

Even more striking is the simple fact that, in most 3-D printing cases, the allegedly protected underlying material might not even be copyrightable at all. In one example, Katy Perry's lawyers sent cease and desist letters to an artist that created a model of the Left Shark figure that accompanied her Super Bowl performance, even though the useful-article doctrine likely precluded its protection under copyright.[243] In another case, Augustana College claimed that

235. Bridgeman Art Library, Ltd. v. Corel Corp. (*Bridgeman II*), 36 F. Supp. 2d 191, 197 (S.D.N.Y. 1999).

236. *See* MICHAEL WEINBERG, 3D SCANNING: A WORLD WITHOUT COPYRIGHT 1 (2016).

237. *Id.* at 3.

238. *Id.* at 8.

239. *Id.* at 8.

240. Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc., 528 F.3d 1258, 1269–70 (10th Cir. 2008).

241. *Id.* at 1269.

242. *See* Cronin, *supra* note 10, at 33 (discussing the spark of original expression in another 3-D scanning case, Osment Models, Inc. v. Mike's Train House, Inc., No. 2:09-CV-04189-NKL, 2010 WL 5423740, at *6 (W.D. Mo. Dec. 27, 2010)); *see also* Lucky Break Wishbone Corp. v. Sears Roebuck & Co., 373 F. App'x 752, 755 (9th Cir. 2010) (affirming district court's finding that plastic wishbones from a 3-D scan of an actual turkey wishbone were "sufficient to constitute original expression" due to the shaping of the electrodes used for scanning).

243. Dagne, *supra* note 234, at 580. For a discussion of why the Left Shark is not copyrightable, see Letter from Christopher Sprigman, Professor of Law, to Steven Plinio, GreenbergTraurig (Feb. 11,

an artist who circulated CAD files of an exact replica of a Michelangelo sculpture of Moses installed on its campus violated its copyright, even though the original sculpture is firmly in the public domain.[244] In another example, a designer received a takedown notice for CAD files of figurines inspired by the game *Warhammer 40,000* that were uploaded to the Internet, on the basis that the game creators owned a copyright to the "style" of the game. One cannot copyright a "style," but that did not seem to matter to the game creator.[245]

In an even more ironic case, designer Ulrich Schwanitz created a CAD file for the famed "Penrose" or "impossible" triangle, a famous optical illusion. He then challenged others to do the same thing and started selling versions of it through Shapeways' website.[246] Yet when another person figured out how to replicate Schwanitz's (hidden) 3-D design and posted it to Thingiverse, an open-source website, Schwanitz sent him a cease and desist letter—even though he did not own a copyright in the original triangular design (optical illusions, after all, can only be patented).[247]

To be fair, there are 3-D scans that are expressive in character (and thus protectable) because they may be nonrepresentational or manipulated. For example, Michael Weinberg points to the scans of ancient works of sculpture used by the artist Sophie Kahn, which are intentionally nonrepresentational, incomplete, and distortive of the source material.[248] Or the work *Shine* by Geoffrey Mann, which intentionally avoids the best practices of scanning to produce a distorted candelabra.[249] In addition to 3-D printing, some augmented

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2015), https://s3.amazonaws.com/s3.documentcloud.org/documents/1659612/021015plinio.pdf [https://perma.cc/M7CV-KMCD]. For more background, see Signe Brewster, *Katy Perry's Lawyers Demand Takedown of 3D Printable Left Shark*, GIGAOM (Feb. 5, 2015), https://gigaom.com/2015/02/05/katy-perrys-lawyers-demand-takedown-of-3d-printable-left-shark [https://perma.cc/2JQF-7L9D]; Mike Masnick, *There's Something Fishy With Katy Perry's Left Shark 3D Printing Takedown*, TECHDIRT (Feb. 6, 2015, 10:35 AM), https://www.techdirt.com/articles/20150205/16305829921/katy-perry-claims-copyright-over-left-shark-issues-takedown-over-3d-printable-version.shtml [https://perma.cc/HM7A-CD8C], and Mike Masnick, *Can't Make This Up: Katy Perry's Lawyers Use Left Shark Photo Taken by Guy They're Threatening in Trademark Application*, TECHDIRT (Feb. 12, 2015, 4:09 AM), https://www.techdirt.com/articles/20150211/12073529990/cant-make-this-up-katy-perrys-lawyers-use-left-shark-photo-taken-guy-theyre-threatening-trademark-application.shtml [https://perma.cc/4UMT-4ZZ8]. *See generally* Dagne, *supra* note 239 (discussing Left Shark episode and others).

244. Mike Masnick, *College Claims Copyright on 16th Century Michelangelo Sculpture, Blocks 3D Printing Files*, TECHDIRT (Jan. 23, 2015, 10:32 AM), https://www.techdirt.com/articles/20150122/17181429784/college-claims-copyright-16th-century-michelangelo-sculpture-blocks-3d-printing-files.shtml [https://perma.cc/V52F-3ANM].

245. *See* Dagne, *supra* note 234, at 580; Rimock, *supra* note 130, at 13.

246. Rimock, *supra* note 130, at 18.

247. *Id.*; *see also* Mike Masnick, *Is This the First DMCA Notice over 3D Printer Plans?*, TECHDIRT (Feb. 22, 2011, 5:28 AM), https://www.techdirt.com/articles/20110221/22375313196/is-this-first-dmca-notice-over-3d-printer-plans.shtml [https://perma.cc/K3NF-JZFM].

248. WEINBERG, *supra* note 236, at 10 (discussing Kahn).

249. *Id.* at 10–11 (discussing Mann).

reality projects might also lend themselves to the creation of transformative, mash-up works of appropriation deserving of protection.[250]

Yet even in cases where there might be a copyrightable element at stake, companies may demand that production of the item cease rather than explore the possibility of a mutually satisfactory licensing solution. In one example, HBO sent cease and desist letters to a designer who made 3-D printed phone docks modeled after the iron throne in the show *Game of Thrones*.[251] The designer, Fernando Sosa (also involved in the Left Shark dispute), had actually spent months designing with Autodesk Maya, and, after receiving the letter, ceased production in hopes of reaching a licensing agreement with HBO. That never occurred.[252]

A final set of issues, like the ones in the previous section, stems from institutions' ability to restrict access by limiting permission. Here, both market and nonmarket concerns may continue to be at issue, just as in the O'Keeffe Museum example addressed in the previous section. Consider an example: Around sixteen years ago, at the University of Washington and Stanford University, a group of students and faculty created a digital 3-D scan of Michelangelo's *David*. Even though the scan was largely the product of a group of students and faculty, a single professor—a retired member of Stanford's computer science department—assumed total responsibility over responding to permission requests to access the model.[253] Even more troubling, to receive access to the model, one must promise to "keep renderings and use of the data in good taste" because the artifacts "are the proud artistic patrimony of Italy."[254]

D. Cultural, Ethical, and Moral Concerns

Of course, at the same time that we might be concerned about copyright-related limitations on the remix of cultural properties, we also need to be especially mindful of the way in which museums have tended to obscure the concerns of indigenous peoples—who have been used as objects of study and have faced misappropriation and misuse of their sacred artifacts. As Angela Riley and others have observed, unauthorized reproduction and distribution of indigenous cultural property can be a significant problem for indigenous communities today.[255] Similarly, Madhavi Sunder and Anupam Chander have

250. *See* Wassom, *supra* note 86, at 11.

251. Dagne, *supra* note 239, at 580.

252. Nathan Hurst, *HBO Blocks 3-D Printed "Game of Thrones" iPhone Dock*, WIRED (Feb 13, 2013, 1:57 PM) http://www.wired.com/2013/02/got-hbo-cease-and-desist [https://perma.cc/EYY4-JT97].

253. Cronin, *supra* note 10, at 37–38.

254. *Id.* at 38 (quoting Marc Levoy, *The Digital Michelangelo Project Archive of 3D Models*, http://graphics.stanford.edu/data/mich/#Obtaining the data [https://perma.cc/3ZH2-D92T]).

255. For additional commentary, see Keith Aoki, *Neocolonialism, Anticommons Property, and Biopiracy in the (Not-So-Brave) New World Order of International Intellectual Property Protection*, 6 IND. J. GLOBAL LEGAL STUD. 11 (1998); Graham Dutfield, *TRIPS-Related Aspects of Traditional Knowledge*, 33 CASE W. RES. J. INT'L L. 233 (2001); Angela R. Riley, *Indigenous Peoples and the*

written about how the romanticization of the public domain obscures deeper questions about structural inequality and exploitation, often to the detriment of indigenous people and other communities in the developing world.[256] For these reasons, Michael Brown explained, "[f]rom the indigenous-rights perspective, the public domain is the problem, not the solution, because it defines traditional knowledge as a freely available resource."[257]

While the community of open access advocates has often chided museums for their restrictive policies—and rightly so—many within these communities have also overlooked or discounted the significant concerns raised by indigenous communities with respect to the digital dissemination of traditional knowledge.[258] At the same time that indigenous concerns rightfully persist, both material and intangible cultural heritage collections are rapidly being digitized—tangible artifacts are photographed and/or prepared for 3-D printing, and documentation of intangible cultural heritage is transformed from photographs or other media into digital files for rapid transmission.[259]

These concerns, again, go to the heart of cultural heritage. As a United Nations official explained, "for indigenous peoples, heritage is a bundle of relationships, rather than a bundle of economic rights."[260] On one hand, digitizing items of cultural heritage, as in many other contexts, promises a powerful way to reconnect with the past and build greater collaboration between technologists, indigenous communities, and the museums and libraries that protect and disseminate knowledge. Technology and new media represent enormous potential for widespread user interactivity; within indigenous communities, 3-D projection systems have been touted as a powerful way to connect individuals to their past, suggesting that the emotional connection to "objects and places is as important in a virtual world as it is in the physical

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Promise of Globalization: An Essay on Rights and Responsibilities, 14 KAN. J.L. & PUB. POL'Y 155, 159 (2004); Angela R. Riley & Kristen A. Carpenter, *Owning Red: A Theory of Indian (Cultural) Appropriation*, 94 TEX. L. REV. 859 (2016); Naomi Roht-Arriaza, *Of Seeds and Shamans: The Appropriation of the Scientific and Technical Knowledge of Indigenous and Local Communities*, 17 MICH. J. INT'L L. 919 (1996); Lakshmi Sarma, *Biopiracy: Twentieth Century Imperialism in the Form of International Agreements*, 13 TEMP. INT'L & COMP. L.J. 107 (1999); Rebecca Tsosie, Response, *Indigenous Identity, Cultural Harm, and the Politics of Cultural Production: A Commentary on Riley and Carpenter's "Owning Red,"* 94 TEX. L. REV. SEE ALSO 250 (2016); Rebecca Tsosie, *Reclaiming Native Stories: An Essay on Cultural Appropriation and Cultural Rights*, 34 ARIZ. ST. L.J. 299, 339 (2002).

256. Anupam Chander & Madhavi Sunder, *The Romance of the Public Domain*, 92 CALIF. L. REV. 1331, 1351–54 (2004).

257. Yu, *supra* note 147, at 458 (quoting MICHAEL F. BROWN, WHO OWNS NATIVE CULTURE? 237 (2003)).

258. *See* Kimberly Christen. *Does Information Really Want to Be Free? Indigenous Knowledge Systems and the Question of Openness*, 6 INT'L J. COMM. 2870, 2888 (2012).

259. *See* Kate Hennessy, *Virtual Repatriation and Digital Cultural Heritage: The Ethics of Managing Online Collections*, ANTHROPOLOGY NEWS, Apr. 2009, at 5.

260. Erica-Irene Daes, *Intellectual Property and Indigenous Peoples*, 95 AM. SOC'Y INT'L PROC. 143 (2001).

one."[261] In contrast to many other reports that tend to view reproductions as soulless copies, some researchers reported that even rendered images can become living presences in the same way that their originals did—thus replicating the complicated positive and negative emotions regarding their public circulation.[262]

Virtual and augmented reality offer immersive experiences that can further connect users to objects and places from their past. One study reported that Inuit elders felt extraordinarily connected to the virtual world that depicted legends and lifeways from their ancestors.[263] In another example, for its *(Im)material Artefacts* project, the National Museum Cardiff selected a variety of ceramic artifacts from its collection, scanned them, and asked participants to remix the digital scans—which it then put on display with the original artifacts.[264] One indigenous artist who participated in the project explained that his ability to engage with the cultural property (in this case, a Mexican mask) held by the museum gave him a sense of repatriation, even though the artifact was held thousands of miles from its original site of creation.[265]

Yet, some argue that such digitization projects run the risk of continuing a legacy of exploitation of indigenous peoples in the name of mainstream culture.[266] At the same time that digitization projects in indigenous communities can generate the articulations of rights—whether they stem from ethical, moral or intellectual property considerations—they also underscore the difficulties inherent in enforcing and protecting them.[267] While it is arguable that "information wants to be free," there are cultures that believe that access restrictions are an essential part of cultural survival.[268]

A central area of conflict, therefore, stems from digitization, which can occur before an indigenous community has the ability to survey the information and decide whether the information needs to be restricted in some manner due to concerns about cultural privacy, sensitivity, or misappropriation.[269] Sometimes the materials are meant to be kept secret; other times they are meant to be used only in a certain manner and by certain individuals.[270] The nature of a digital

261. Peter Dawson, Richard Levy & Natasha Lyons, *"Breaking the Fourth Wall": 3D Virtual Worlds As Tools for Knowledge Repatriation in Archaeology*, 11 J. SOC. ARCHAEOLOGY 387, 389 (2011).

262. *See id.*

263. *Id.* at 395–97.

264. *See* Younan, *supra* note 102, at 26–27.

265. *See id.* at 28.

266. For more on issues regarding exploitation, see Chander & Sunder, *supra* note 256, at 1351–54, *and* Riley & Carpenter, *supra* note 255.

267. Hennessy, *supra* note 264, at 6.

268. Kimberly Christen, *Access and Accountability: The Ecology of Information Sharing in the Digital Age*, ANTHROPOLOGY NEWS, Apr. 2009, at 4–5.

269. Hennessy, *supra* note 259, at 6.

270. Yu, *supra* note 147, at 456.

medium makes control very difficult to achieve.[271] "Although digital ethnographic materials can be used to build relationships and facilitate self-representation, they can also be uploaded to the Internet for instantaneous distribution, circulation and unrestricted access, making otherwise privately managed tangible and intangible culture public."[272]

The conflict between culture and digitization raises complex legal and ethical issues. For example, significant controversy has accompanied the use of digital imaging of Native American remains by institutions mandated under the Native American Graves Protection and Repatriation Act (NAGPRA) to return their physical skeletal collections.[273] As one author argues, such digital assembly contravenes the very spirit of NAGPRA, which was founded upon the principle of repatriation.[274] Another area of conflict involves the concept of "virtual" or "digital repatriation," which is said to be misleading because it implies that objects are actually being repatriated or returned to the source community. As two authors argue, "though data sharing is taking place, there is no restitution or repatriation."[275] Consequently, some argue that the notion of digital repatriation is really a red herring, in some ways designed to deflect attention from countries that refuse to repatriate the physical, material objects back to their source communities.[276] "If it is truly repatriation," advocate Jim Enote has said, "then we get the ownership of it."[277]

Although these critiques are certainly warranted, many institutions have tried to collaborate with tribes by returning the original items and supporting tribes' efforts to restrict sharing and circulation. For example, in several 3-D repatriation projects, tribes take great care to restrict and control the use of cultural objects with museum support. Further, in one Smithsonian project using 3-D printing to preserve and repatriate items from the Hoonah Indian Association, only the tribal administrator may touch certain objects, due to

271. *See* Hennessy, *supra* note 259, at 6.

272. *Id.*

273. Kathryn Milun, *Keeping-While-Giving-Back: Computer Imaging and Native American Repatriation*, 24 POLAR 39, 39 (2001).

274. *Id.* at 51.

275. *See* Robin Boast & Jim Enote, *Virtual Repatriation: It Is Neither Virtual nor Repatriation*, *in* HERITAGE IN THE CONTEXT OF GLOBALIZATION 103, 104, 109 (Peter F. Biehl & Christopher Prescott eds., 2013) (emphasis removed) (describing a number of virtual repatriation projects, including the Reciprocal Research Network and the Plateau People's Web Portal).

276. *Id.* at 111.

277. Enote, for example, helped create the Zuni Consolidated Collections System to digitally combine the collections of six different museums in order to aid the accuracy of object identification. *See* Charles Zange, *Community Makers, Major Museums, and the Keet S'aaxw: Learning About the Role of Museums in Interpreting Cultural Objects*, MW2015: MUSEUMS AND THE WEB 2015 (Jan. 31, 2015), http://mw2015.museumsandtheweb.com/paper/community-makers-major-museums-and-the-keet-saaxw-learning-about-the-role-of-museums-in-interpreting-cultural-objects [https://perma.cc/QR7T-QV6J] (quoting Jim Enote, Keynote at "After the Return: Digital Repatriation and the Circulation of Indigenous Knowledge" Workshop (Jan. 19, 2015) (discussing the Zuni Consolidated Collections System)).

cultural restrictions.[278] The project remains a powerful example of how 3-D printing can preserve, rather than challenge, the meaning associated with items of cultural heritage.[279]

In another example, the Smithsonian created a series of 3-D replicas of objects that have been repatriated to the Tlingit community, including a "Killer Whale Crest Hat," which depicts a whale emerging from the ocean.[280] Although most repatriated objects are kept from display after repatriation, the Tlingit clan leaders decided to take the bold step of allowing the artifact to be digitally represented and shown to the public. However, they did so only after ensuring that no copies of the crest objects would appear on the web and that no major steps were taken in the reproduction process without their consultation.[281] They also asked for a label making it clear that the object was a replica to assure the Tlingit people that what they were viewing was not an original, but rather a very well done reproduction—in order to minimize the chance of them thinking the display was inappropriate or offensive.[282]

In the Tlingit example, the line between the authentic item and the reproduction was an important one. It demonstrated how meaning becomes encoded into a digital reproduction by the creator; as one study noted, "[t]he authenticity of what something 'is' and 'is not,' as mediated through a digital asset, in part depends on who owns or influences the asset, what parties are involved, and [what] common or divergent goals they share in the object's display."[283] If the data surrounding (or encoding) an object lacks connection to the indigenous community that originated the item, then it risks being perceived as "disparate" from that community.[284] That is why it is so important for institutions to mediate and accommodate complex legal and ethical concerns.

In other digital projects, many of which comprise websites that share culturally sensitive information, collaborating tribes have the power to curate, add to, and restrict the materials shared on the portal by tagging them as

278. *See* Elizabeth Jenkins, *3D-Printed Replicas: Savior or Scorn of Rare Tlingit Artifacts?*, ALASKA PUB. MEDIA (Nov. 3, 2015), http://www.alaskapublic.org/2015/11/03/3d-printed-replicas-savior-or-scorn-for-rare-artifacts [https://perma.cc/3GL5-DWVU].

279. For a great discussion of other participatory projects with indigenous communities, see Jennifer Shannon, *Artifacts of Collaboration at the National Museum of the American Indian*, 7 NEW PROPOSALS 37 (2015) and Michelle L. Fitch, Native American Empowerment Through Digital Repatriation (Dec. 2013) (unpublished M.A. thesis, East Tennessee State University), http://dc.etsu.edu/cgi/viewcontent.cgi?article=3660&context=etd [https://perma.cc/5BG4-WN8U]; DIG. RETURN, http://digitalreturn.wsu.edu [https://perma.cc/DRG4-PJJE].
On other digital repatriation efforts, see R. Eric Hollinger et al., *Tlingit-Smithsonian Collaborations with 3D Digitization of Cultural Objects*, 7 MUSEUM ANTHROPOLOGY REV. 201 (2013); Zange, *supra* note 277.

280. Hollinger, *supra* note 279, at 201; Zange, *supra* note 277.

281. Hollinger, *supra* note 279, at 204.

282. *Id.*

283. Zange, *supra* note 277.

284. *Id.*

culturally sensitive.[285] In a project with the Warumungu community, for example, anthropologist Kimberly Christen collected images that were divided into three categories: Open ("with 'no limits placed on . . . viewing'"), Partially Closed ("reproduced with permission of those in the recording"), or Closed ("only to be viewed by people with proper ritual standing").[286] In addition, instead of using Google's model of making everything searchable and accessible, Christen designed an archive and search engine that reflected respect for the cultural relationships and protocols within an indigenous system. The program also educated viewers who believe in unrestricted access to content.[287] In Christen's archive, a clip might stop halfway-through to demonstrate how an audience might be restricted by gender, or an audio of a song might fade to restrict hearing to "only those who have been ritually initiated," among other features.[288] In each instance, the site explains the reason why the material is restricted from viewing and depicts the cultural protocols that govern the material.[289] As Christen writes,

> The choice is not between an open or closed anthropology. . . . Information in the digital age supposedly wants to be free. Corporate greed and legal straight-jacketing have clouded the debate so that any type of access control, sharing protocols or information management looks suspicious. What Digital Dynamics, Mukurtu and similar projects offer is a view of information not as wanting to be "free," but as already part of ethical systems in which it wants to be responsible.[290]

That is why each item depicted on the site is annotated with reference to the cultural protocols that govern it, enabling the Warumungu tribe to dictate precisely the terms under which the information may be shared and for what purpose.[291]

Such examples demonstrate powerful opportunities for ethically sensitive collaborations, but these collaborations should by no means be limited to indigenous communities alone. Museums can also use these techniques to design digitization and participatory projects that both collaborate with and engage the concerns of a variety of social groups who may be historically disenfranchised by museum practices. The point here is to encourage museums to think actively and ethically about how important it is to strike a balance between ensuring

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285. *See* Boast & Enote, *supra* note 275, at 105.

286. *See* Zange, *supra* note 277.

287. *See* Kim Christen & Chris Cooney, *Digital Dynamics Across Cultures*, VECTORS (2008), http://vectorsjournal.org/projects/index.php?project=67 [https://perma.cc/T98G-GQEL] (depicting modes of information sharing among the Warumungu tribe in Australia); *see also* Christen, *supra* note 268, at 4.

288. Christen, *supra* note 268, at 4.

289. *Id.* (explaining that the project's goal "was to use the medium itself as a means of reflecting on the limits of the Internet to value other knowledge systems, and at the same time challenge people to take seriously different types of information distribution and production systems").

290. *Id.* at 5.

291. *Id.* at 4–5.

access and protecting sensitive cultural properties, particularly when addressing the needs of communities that historically have been subjected to misappropriation.[292]

III.
SOLVING THE PARADOX OF TECHNOHERITAGE

As I have suggested in this Article, technoheritage implicates a paradox not specific to museums, but one that is faced by all institutions that embrace interactivity; the more information an institution shares with the public, the more likely it will face an inability to control the uses of its collections. Copyright and contractual controls, then, not only become even more attractive options to restore the balance between public participation and institutional identity, but they also come at a cost to the museum's role as a publicly minded institution.

Consequently, some scholars have argued that since museums are responsible to the public, they should be accessible in a way that avoids copyright law's overreach.[293] But the reality is far more complex, producing a central irony. Under today's regime—following *Bridgeman*—in the absence of copyright protection, the law essentially empowers museums to take even more restrictive measures to control reproduction of their artworks. Even without copyright protection, a museum can still bar any reproductions of a work in its collection simply because it owns the tangible work and can control physical access to it.[294] As one scholar writes, "[u]nder a contract regime, nothing stops a museum from simply refusing to allow cameras into the galleries, effectively forestalling any personal reproduction beyond pencil and paper."[295]

Within a purely contractual regime, it is difficult to challenge a denial of access. Consider two examples. In the late 1980s, researchers discovered a series of human brain fragments in Morocco and used laser-scanning, magnetic resource imaging, and CT scans to develop a dataset of the composite skull image at a museum in France. Both the French museum and the Moroccan government claimed a copyright interest in the datasets—the laser scans, magnetic resonance images, and the CT scans—even though these claims were potentially subject to challenge under existing legal principles. Although authorities allowed researchers to use the datasets to create a composite image of the skull, they both required that the datasets not be made public as a precondition for access, limiting access to knowledge as a result.[296] In another example, a group of archaeologists working with a grant from the European Community attempted to digitize government photos and imaging data from a Greek site for the purpose of producing an interactive compact disc. Apparently,

292. *Cf.* Carpenter, Katyal & Riley, *supra* note 142 (discussing forms of misappropriation).
293. Petri, *supra* note 193, at 8.
294. Reese, *supra* note 229, at 1036.
295. Allan, *supra* note 157, at 984 n.123.
296. Eventually, the skull image was published. Alberts Carson, *supra* note 194, at 290.

the Greek Ministry of Culture refused to allow the researchers to digitize the photos and the imaging data, claiming a copyright interest in the material. When they attempted to gather their own images and data (without relying on the government's material), the archaeologists were banned from the site.[297]

Most museums already undertake some methods of control over the copying of their works, even if more extreme methods are not used. Museums can and often do restrict photography—prohibiting flash or the use of tripods—which effectively makes it impossible for a user to make the kind of high quality reproductions that most users desire.[298] Other museums, like the National Portrait Gallery, maintain a strict no-photograph policy on the grounds that reproductions of their works must be by written permission only.[299]

While these restrictions may seem objectionable at first glance, consider the opposite approach: under a regime which awards copyright to reproductions, one runs the risk of every visitor photographing works and then claiming copyright protection in the resulting reproduction. This approach would create a world of overlapping copyright and raise, effectively, an anticommons issue due to a multiplicity of ownership claims.[300] The ideal solution requires an examination of a museum's incentives to invest in preservation and access alongside questions of how these incentives might affect the scope, protection and purpose of the public domain.[301]

A. Potential Legal Solutions

As Crews points out, *Bridgeman*'s effects are significant—they cast doubt on the claims of copyright over millions of photographic reproductions of 2-D works and thus affect "the livelihood of many professional photographers."[302] Crews writes, "to deny the photographer legal protection for his or her labors may well erode the incentive to produce high-quality work and to make the resulting photographs widely accessible."[303] One author echoes this view, noting, "[i]f [*Bridgeman* is] correct, the decision has potentially severe consequences for photographic libraries, art galleries and museums, for whom an important source of income is the licensing fees obtained for use of photographs of works of art."[304]

Some of these observations, of course, are justified. Museums have every right to regulate or limit access to an object for both protective and rent-seeking

297. *Id.* at 290–91.
298. Reese, *supra* note 229, at 1037.
299. Petri, *supra* note 198, at 9.
300. Allan, *supra* note 157, at 984 n.126; *see generally* Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621 (1998) (introducing an anticommons approach to property management).
301. Reese, *supra* note 229, at 1034.
302. Crews, *supra* note 154, at 805.
303. *Id.*
304. Garnett, *supra* note 162, at 229.

reasons. It is important, therefore, to preserve the incentives in place to ensure the production of high quality reproductions. Admittedly, a major source of revenue involves the sale of art reproductions and their derivative products. For example, in one year, more than 13 percent of the Philadelphia Museum's revenue came from its wholesale and retail operations.[305] Clearly, museums have strong incentives—more so than any other entity—to ensure the quality and widespread distribution of their reproductions.[306] In addition, museums have a monopoly power over producing those reproductions, due in part to their ownership of the objects, their connections to those with photographic skills, and their built-in incentives to invest in high-quality equipment or to secure freelance agreements.[307] In addition, museums also have a site for selling their reproductions close to the locations of the original works of art.[308]

Should some of those incentives change, however, either because copyright protection for these reproductions is no longer available or because of the prospect of cheaper high quality substitutes, the market may open up for others to sell their own copies of public domain artworks. This may occur despite a drop in quality because of technical constraints that emerge from not having ownership access to the artwork. If museums can no longer recover their investment in creating photographs, they may no longer have the same set of incentives in place to invest in their own reproductions.[309] In general, amateur photography is nowhere near as effective, comprehensive, and detailed as a precise scan or official photograph taken by a museum because of the time, skill, and costs involved in developing an effective reproduction. For example, after surveying work on Picasa and Flickr, one study concluded that few images were suitable for publication because they were too individualistic and were unrepresentative of the underlying works.[310]

If this study is correct, then as long as museums are offering the best quality reproductions, we need not worry about other markets for reproduction.[311] Under this view, labeled by some as the "Gift Shop defense," museums rely on the revenue generated from high quality reproductions, and in the absence of copyright law, will simply use contract and licensing restrictions to protect their revenue streams.[312] Merchandising rights can be protected through other means, such as trademark or unfair competition laws.[313] Trademark law, for example, can protect a museum's merchandising rights in its owned images when they are

305. Allan, *supra* note 157, at 982.

306. *Id.*

307. *See* Cronin, *supra* note 133, at 734 (noting that a proliferation of poor quality reproductions would also fuel a market in high quality reproductions).

308. *See* Reese, *supra* note 229, at 1041 (discussing these incentives).

309. *Id.* at 1042.

310. Petri, *supra* note 198, at 9.

311. *See* RINA ELSTER PANTALONY, WORLD INTELLECTUAL PROP. ORG., MANAGING INTELLECTUAL PROPERTY FOR MUSEUMS 46–47 (2013).

312. Blackwell & Blackwell, *supra* note 133, at 147–48.

313. Petri, *supra* note 193, at 9.

used on coffee mugs, tote bags and the like.[314] Thus, without copyright in their reproductions, museums are more likely to turn to trademark, contract, and licensing arrangements to maintain revenue streams from their materials.[315]

Not all work is in the public domain, however, and museums may need to seek other ways to protect their reproductions. Consequently, one legal solution put forth by scholars involves the prospect of a particular exemption for museums.[316] Section 108 of the Copyright Act already permits reproduction for the purposes of preservation by libraries and archives, as long as the work is reproduced without the purpose of obtaining a direct or indirect commercial advantage from the copy, and as long as the collections making the copy are open to the public (among other restrictions).[317] While discussions have been underway regarding possible broadening of these allowances, no clear exemptions exist for museums, and the purposes of the exemption are limited to preservation, not commercialization protection of public access.[318] The issues with crafting an exemption—not to mention the inertia of getting Congress to address a solution—have led Guy Pessach to argue in favor of a compulsory licensing scheme that would allow for reproduction for the purpose of digital cultural preservation and allow for royalties to copyright owners.[319]

In the absence of such solutions, Pessach argues strongly in favor of broadening fair use interpretations to cover digital heritage preservation. For example, a broadened fair use regime would include nonprofit, educational purposes, thereby allowing for a realm of limited, personal use that is noncommercial in nature.[320] Or it might allow for transformative use, thus honoring secondary creations.[321] As has been covered at length elsewhere, fair use is an affirmative defense that protects uses for teaching, scholarship, or research. To determine fair use, courts study four main factors: (1) the purpose and character of the use; (2) the nature of the copyrighted work; (3) the amount and significance of the portion used; and (4) the effect of the use on the market for the original.[322] Yet, Pessach notes that it would be unlikely for a court to protect large-scale digital preservation of an entire collection of artworks, given

314. Reese, *supra* note 229, at 1042–43.

315. Allan, *supra* note 157, at 964.

316. *See* Pessach, *supra* note 40, at 265.

317. *See id.* at 265 (discussing this exemption in the context of the digital museum). For a great discussion of these exemptions and other protections for cultural institutions, see PETER B. HIRTLE, EMILY HUDSON & ANDREW T. KENYON, COPYRIGHT AND CULTURAL INSTITUTIONS: GUIDELINES FOR DIGITIZATION FOR U.S. LIBRARIES, ARCHIVES, AND MUSEUMS 107 (2009), https://ecommons.cornell.edu/bitstream/handle/1813/14142/Hirtle-Copyright_final_RGB_lowres-cover1.pdf [https://perma.cc/8EHA-Z6BH].

318. *See* Pessach, *supra* note 40, at 267 (discussing how Section 108 is obsolete in the museum and digital contexts).

319. *See id.* at 267–68.

320. Allan, *supra* note 157, at 986.

321. *Id.* at 986–87.

322. *See* Pessach, *supra* note 40, at 270–72; Allan, *supra* note 157, at 986.

that there is at least some prospect of copyright owners developing their own digital copies (and museums running the risk of market substitution as a result).[323] A further obstacle is the total lack of transformation present in digitizing artworks, thus discounting the validity of fair use protection to works that are just motivated by reproduction.[324]

B. Licensing and Other Contractual Solutions

At first glance, licensing schemes seem like the most attractive route for museums to pursue because they offer agreements that are negotiated and consented to by both parties.[325] Many museums currently deal with copyright clearance through collecting agencies and other professional institutions, and to a lesser degree, the artists themselves (or their estates). In contrast, because licensing schemes are usually individualized, they may well result in much greater transaction costs for museums.[326] On the other hand, as Pessach notes, commercial digital agencies with well-financed portfolios, such as Corbis and Getty Images, may well be incentivized to not only digitize the museum collections themselves, but also to manage licensing requests on the museum's behalf.[327] This solution might also improve the quality of museum databases, which are highly rudimentary in nature.[328] As some have noted, the focus on image quantity can unwittingly contribute to a failure to focus on data quality.[329] While at first glance this prospect may seem enticing to the modern museum, it is important to note that commercial agencies may have different incentives from museums, which are also focused on the public trust rather than on a singular profit motive.

Today, a number of museums have developed creative licensing regimes to balance their interests in control and profit with their commitment to the public—a far cry from previous eras. As one study notes, "[t]he early days of digitisation saw projects which were unable to make use of materials, or unable to circulate their resulting outputs, because the primary historical resources they so depended on did not belong to them . . . or the licensing agreements arranged were so

323. *See* Pessach, *supra* note 40, at 270.

324. *See id.* at 271. In contrast, there are a few cases that suggest that fair use might protect thumbnail images. *See id.* at 271–75 (discussing Bill Graham Archives LLC. v. Dorling Kindersley Ltd., 386 F. Supp. 2d 324 (S.D.N.Y. 2005), *aff'd*, 448 F.3d 605 (2d Cir. 2006); Kelly v. Arriba Soft Corp., 336 F.3d 811 (9th Cir. 2003); Perfect 10 Inc. v. Google Inc., 416 F. Supp. 2d 828 (C.D. Cal. 2006).

325. For a fuller description of how these schemes might work, see Pessach, *supra* note 40, at 261. It is worth noting that, in the 3-D context, a number of companies have embraced licensing their works—Hasbro has licensed its copyrighted toy designs, such as Mr. Potato Head, Tonka Trucks, and Transformers, to 3-D print manufacturers. *See* Menell & Vacca, *supra* note 209, at 16.

326. *See* Pessach, *supra* note 40, at 261.

327. *See id.* at 262–63.

328. *See* Cameron & Robinson, *supra* note 28, at 165 (noting "the speed of the digitization process has not generally been reciprocated by a review of data quality").

329. Slavko Milekic, *Toward Tangible Virtualities: Tangialities*, *in* THEORIZING DIGITAL CULTURAL HERITAGE, *supra* note 11, at 369 (observing that viewing a Jackson Pollock painting as a thumbnail prevents viewers from seeing the essence of Pollock's technique).

complex as to be unworkable."[330] In contrast, today's era has a number of innovative licensing solutions. One contemporary license solution is Getty's practice of marking works as "No Known Copyright Restrictions," to allow users to use images within the public domain.[331] While the denotation allows for users to reproduce images when needed, Crews writes that it also might pose issues for museum lawyers who might worry over the possibility of a legal challenge if their determinations are proven otherwise.[332]

As museums seek new revenue sources in merchandising and licensing, experts have argued that museums must "quite simply, build, somehow, exclusive rights to [their] collections."[333] Yet, they should also balance these exclusive rights with public access. One solution has been to allow free licenses for noncommercial use, while charging for commercial use.[334] In another example, the Metropolitan Museum of Art allows the use of images on its website for "limited non-commercial, educational, and personal use," allowing individuals to post images on their websites (as long as the sites do not have advertisements) and use images for unpublished school reports.[335] While some have criticized this solution because it "requires a claim to rights that might be unjustified," which can cause confusion and perhaps stifle knowledge, it does provide a revenue stream for museums while allowing for limited access.[336]

Similarly, another solution, which some researchers favor, is to sell highly professional digital files to customers, paralleling the business models of companies like Red Hat, which sells services related to the Linux operating system.[337] The Rijksmuseum does, for example, maintain higher resolution images for commercial customers who wish to use the images for profit.[338] Yet, it is also a public museum that is publicly funded, and it therefore views the objects in its collection as essentially owned by the public.[339] Another institution, the Hathi Trust, categorizes its digital holdings into: (1) works protected by copyright law; (2) works protected by copyright law but available on a limited basis according to statute; (3) works copyrighted but with an open access license; and (4) works eligible for copyright but released into the public domain, with slight variations present to address international differences in protection.[340]

330. Terras, *supra* note 27, at 4.
331. Crews, *supra* note 154, at 811.
332. *Id.* at 823–24.
333. PETER WIENAND, ANNA BOOY & ROBIN FRY, A GUIDE TO COPYRIGHT FOR MUSEUMS AND GALLERIES 52 (2000).
334. Blackwell & Blackwell, *supra* note 133, at 161.
335. Allan, *supra* note 157, at 985.
336. Blackwell & Blackwell, *supra* note 133, at 161.
337. *Id.*
338. *Id.* at 156–57.
339. *Id.* at 156.
340. *Id.* at 157.

Another solution might be to ask museums to charge service fees for reproductions and to disband with copyright license fees altogether.[341] Fees for service arrangements can be attractive because they remunerate the institution for any labor or costs related to the photography, and the images can be provided to the institution, allowing researchers to use the images noncommercially.[342] Yet this would mean that museums would lose control over the reproduction altogether, unlike copyright regimes that require some licensing agreement to occur.[343]

One key solution can be Creative Commons, used widely by the museum community and others. Creative Commons offers licenses that are meant to be an alternative to the rigidity of the copyright system; it does not provide copyright protection, but instead offers a licensing scheme that allows for a reallocation of rights under copyright's framework.[344] Holders can reserve certain rights for themselves, but they can also allow for a greater licensing of rights to third parties than traditional copyright might allow. Creative Commons thus blends copyright with contract law in order to allow for greater flexibility and sharing with the public through the mass redrafting of licensing protections.[345]

There is a further reason for why these market-based solutions might be particularly attractive when they go beyond pure legal constraints: these solutions can be designed and particularized to be responsive to the concerns of different constituencies, particularly indigenous communities. In some circumstances, these guidelines can extend much further than the law requires, employing and responding to the moral and ethical concerns associated with intangible cultural heritage.[346] The National Museum of the American Indian, for example, has long differed from other Smithsonian offices in that it actively "adheres to ethical precepts and standards that may not be legally necessary from the viewpoint of the other units."[347] In addition, anthropologists Jane Anderson and Kim Christen have developed an innovative set of licenses and labels for traditional knowledge.[348] They developed this project after noting that Creative Commons, like traditional copyright law, was inappropriate for a communal, indigenous traditional knowledge framework, and also largely impossible to

341. Mitch Tuchman, *Inauthentic Works of Art: Why* Bridgeman *May Ultimately Be Irrelevant to Art Museums*, 24 COLUM.-VLA J.L. & ARTS 287, 315 (2001).

342. Blackwell & Blackwell, *supra* note 133, at 156–57.

343. Petri, *supra* note 193, at 7.

344. *See* Jane Anderson & Kimberly Christen, "*Chuck a Copyright on It": Dilemmas of Digital Return and the Possibilities for Traditional Knowledge Licenses and Labels*, 7 MUSEUM ANTHROPOLOGY REV. 105, 108–09 (2013) (discussing uses of the Creative Commons license for cultural heritage).

345. *See id.*

346. Jennifer R. O'Neal, *Going Home: The Digital Return of Films at the National Museum of the American Indian*, 7 MUSEUM ANTHROPOLOGY REV. 166, 167 (2013).

347. *Id.*

348. *See* Anderson & Christen, *supra* note 344.

reconcile with the restrictions that exist in some indigenous communities on age, gender, initiation, and other categories.[349]

Of course, a contractual solution that gives museums exclusive rights to public domain works is not always ideal, either. If a museum remains the sole source of images for public domain works in its collection, it will be able to charge a supracompetitive price for those images. Since it is able to exclude others from making those reproductions, it can eliminate other sources of competition.[350] Because of this higher price, some uses will never take place—one legal scholar, Anthony Reese, describes the example of a teacher, art historian, or critic who will not be able to afford use of the reproduction and thus cannot teach or publish on the subject.[351]

Moreover, museums may exercise their control in nonmonetary ways by conditioning reproductions on certain kinds of attributions identifying the work, the art, the museum, and even the donor if relevant.[352] Or museums may prohibit certain kinds of alterations—like cropping, coloring, or any other change that might normally be permitted in a work that is in the public domain.[353] Last, they may also exercise expressive control: as one attorney quoted by Reese observes, "[t]he stewards of certain creative properties do not want their Matisse painting complemented by a 2LiveCrew tune."[354] As Reese observes, not even living artists enjoy this level of control under the Visual Artists Rights Act, long considered one of the strongest pieces of legislation for artists' rights in the United States.[355] Lost in the expansion of rights to public domain works are the potentially transformative uses that we might, as a culture, all benefit from, particularly regarding artistic appropriation and reinterpretation—like Andy Warhol's version of the Mona Lisa.[356]

IV.
RETHINKING THE MUSEUM

In a powerful piece, titled, in part, *Is the Museum a Database?*, critic Mike Pepi observed that today's museum faces a "virulent destabilization" because patrons are actively transforming the museum's physical assets into digital ones, ones that are "uploaded, downloaded, visualized, shared, and digitized."[357] "Today," Pepi writes, "we find the museum organizing itself for transmission

349. *See id.* at 110.

350. Reese, *supra* note 229, at 1044.

351. *Id. But see CAA Publishing Grants*, COLL. ART ASSOC., http://www.collegeart.org/publications/pgrants [https://perma.cc/JTG8-3HZ2] (private organization that offers grants to defray the cost of licensing images for publication by art historians).

352. Reese, *supra* note 229, at 1045.

353. *Id.*

354. *Id.*

355. *Id.* at 1045–46.

356. *Id.* at 1046.

357. Mike Pepi, *Is a Museum a Database?: Institutional Conditions in Net Utopia,* 60 E-FLUX J. 1 (2014), http://worker01.e-flux.com/pdf/article_8992811.pdf [https://perma.cc/JM52-TYJA].

and retrieval, anticipating the final aspirations of an algorithmic regime."[358] Pepi laments the resulting "database logic" that these activities produce and argues that they inherently align the museum's institutional interests with those of traditional Silicon Valley enterprises that uncritically adopt a market-based framework.[359] Under this approach, museums measure their relevance in terms of what Pepi calls "the metabolism of the database," defined as "the ability to be queried, manipulated, updated, sorted, and accessed simultaneously."[360] These views, while critical of the database logic that has informed the modern museum, also underscore the need to consider a variety of models for institutional leadership in the museum community.

Today, some might argue that "[t]he database has become the virtual museum."[361] I would argue, in converse, that the museum has become the virtual database. But it is also more than just a database. The museum has become a virtual archive, as well, because the practice of digital archiving has enabled a massive sharing of information and the embrace of user interactivity.[362] In this Part, I argue that we should consider recharacterizing a museum, not just as a brick and mortar institution, but also as an archive *and* a database. It is an archive because it collects images and artworks in their tangible forms, but it also functions as a database when those images become digitized and easily searchable. In other words, in a museum, a collection is both grounded in its physicality and thus circumscribed by its ability to control the facilitation and accumulation of its information. But the museum's offerings in the virtual realm can dramatically shift its holdings toward greater public access. The hybridity between the two—archive and database—underscores the museum's capability to integrate concerns about both tangible and intangible properties in the governance of its collection.

This hybrid identity also carries important legal possibilities for reframing the paradox that many institutions currently face about how to integrate interactivity into their intellectual property portfolios. By rethinking the museum, I argue, we can consider some exciting possibilities for balancing public and institutional interests. The most interesting question for our purposes is how to protect both the museum's institutional interests and its public commitments. As the following Section suggests, the answer may be easier than we thought.

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358. *Id.* at 2.

359. *Id.*

360. *Id.* at 4.

361. Katy Barrett, *Writing On, Around, and About Coins: From the Eighteenth-Century Cabinet to the Twenty-First Century Database*, 25 J. MUSEUM ETHNOGRAPHY 64, 65 (2012).

362. LUKE TREDINNICK, DIGITAL INFORMATION CULTURE: THE INDIVIDUAL AND SOCIETY IN THE DIGITAL AGE 165 (2008).

A. Museum as Database, Museum as Archive

The relationship between the database and the museum is in many ways a fascinating reflection of the differences between tangible properties and intangible properties. Further, this relationship also tracks a parallel tension that exists between archives and databases, which has been similarly characterized by a divide between what is tangible and what is not. These two areas—archive and database—deserve discussion so that we might truly understand the impact of interactivity on the role of any cultural institution, particularly museums. In this Section, I argue that the digital museum functions as both an archive and as a database, and that this hybrid identity actually gives rise to a wider set of legal possibilities for protecting museums than previously thought. If we construe a museum in this way, we discover a host of new possibilities for protecting its collections and its information, all while restoring the vitality and value of the public domain.

Since the onset of the information age, scholars and curators have become obsessed with the role of the archive in museum collections and other institutional contexts. In the 1990s, for example, a fascinating set of scholarly pieces focused on the role of the archive in assembling information, culminating, in part with the publication of Jacques Derrida's *Archive Fever: A Freudian Impression*.[363] Contrary to the conventional view that archives simply receive, catalog, and review quantities of records, this scholarship began to reframe the archiving process itself as an important project that cocreated and shaped the formation of both knowledge and memory.[364] Around the same period, Lev Manovich also began to write about how a "database logic" had begun to pervade modern thinking, becoming a way for us to understand and experience reality.[365] As our use of digital devices begins to expand, he argued, we rely more and more on the database to facilitate our acquisition of information, a structure that changes the way we view and access the world at large.[366]

Such observations from the world of theory are particularly relevant for museums and other cultural institutions because museums operate as collectors, curators, and distributors of knowledge, and because they display elements of both database and archive, even though the two are considered to be very different in character. For example, many argue that an archive is more tangible, more localized, than a Web-based database.[367] An archive, like a museum,

363. Jacques Derrida, *Archive Fever: A Freudian Impression*, 25 DIACRITICS 9 (Eric Prenowitz trans., 1995); *see also* Rachel Hardiman, *En mal d'archive: Postmodernist Theory and Recordkeeping*, 30 J. SOC'Y ARCHIVISTS 27 (2009); Tom Nesmith, *Seeing Archives: Postmodernism and the Changing Intellectual Place of Archives*, 65 AM. ARCHIVIST 24 (2002).

364. *See* Nesmith, *supra* note 363 at 27.

365. *See* LEV MANOVICH, THE LANGUAGE OF NEW MEDIA 218 (2001); *see also* Marlene Manoff, *Archive and Database as Metaphor: Theorizing the Historical Record*, 10 PORTAL 385 (2010).

366. Manoff, *supra* note 365, at 386.

367. *See, e.g.*, Belinda Barnet, *Pack-rat or Amnesiac? Memory, the Archive and the Birth of the Internet*, 15 CONTINUUM 217, 223 (2001).

constructs the past by collecting records related to previous events—preserving, restoring, and cataloguing stored objects.[368] This role has been characterized as a "closed heritage, faithfulness to tradition, a consigned memory."[369]

As Ed Folsom, who works on the Walt Whitman Archive, explained: "[T]he physicality of archive makes it essentially different from database. There will always be more physical information in an archive than in a database, just as there will always be more malleable and portable information in a database than in an archive."[370] He contended that a database facilitates immediate access and the ability to bring together widely disparate elements, but an archive is grounded in physicality.[371] Some argue, however, that archives *are* actually databases, because they serve many of the same functions.[372] They enable the generative production of knowledge, as opposed to a singular framework, and allow for randomized cross-references that characterize unpredictable accumulations and expressions of knowledge.[373]

Yet, despite the gifts that physical tangibility and real world viewing inevitably bring, the digital database has still pervaded many elements of our everyday life, enabling a level of proprietary control. "Our access to the archive," one author writes, "is becoming more dependent upon the technologies of the interface, even as the interface is being transformed to accommodate a host of new digital devices."[374] As I have suggested, a move from a world of tangible cultural heritage into one that is more digitized, more searchable, and more individuated, requires that we also explore how these changes alter the intellectual property protections that govern these interactions. And yet, at the same time, we must remain mindful of the particularly unique experiences that museums offer. Put another way, viewing a database is simply not the same as experiencing a museum. As one author notes, "[s]eeing a thumbnail of a Jackson Pollock painting, or even a 'large' image measuring a whopping 800 x 600 pixels on a computer screen can hardly convey the essence of Pollock's technique."[375]

The museum's resulting hybridity of archive and database also allows for a fascinating interaction between tangible and intellectual property, and here is where the museum's legal limitations and possibilities reside: in the intersection between the two. Just as "[t]he digital both fosters and threatens the archival record," as one author argues, the digitizing of the museum both fosters and threatens its existence.[376] Yet, museums need to be able to embrace this paradox

368. *See id.*
369. *Id.*
370. *See* Ed Folsom, *Database as Genre: The Epic Transformation of Archives*, 122 PMLA 1571, 1576 (2007).
371. *Id.* at 1577.
372. *See* Ed Folsom, *Reply*, 122 PMLA 1608, 1609 (2007).
373. *Id.* at 1609.
374. Manoff, *supra* note 365, at 386.
375. Milekic, *supra* note 329, at 369.
376. Manoff, *supra* note 365, at 395.

that they now face by fostering interactivity while protecting their role as public trustees.

The role of public trustee requires a sincere commitment to openness. Mike Pepi argues that the construction of digital databases carries hidden risks because, at first glance, they may seem to be neutral and autonomous, but in reality, they necessarily implicate the biases, ideologies, and desires of their architects.[377] Even if others argue that the digital shift keeps museums relevant to today's public culture, Pepi, in a critical position, strongly cautions against a full-fledged embrace of tech-related entrepreneurship:

> Today the museum looks less to the rituals of relational aesthetics—social, collaborative, and open-ended—but instead to the entrepreneurial paradigm of the technology enterprise . . . . The same criticisms of the Open Data movement apply to the unquestioned rush to digitize the museum's contents, specifically the charge that such initiatives amount to a 'neoliberalization' of information formerly held in the public trust. That is, to convert the institution into a market-ready form and, crucially, to transition the individual into a relationship with the museum that is entrepreneurial, self-directed, and deterritorialized.[378]

Here, Pepi condemns, in other words, the same thing that Malraux celebrated, identifying a darker side to the process of decentralized curation.[379] Instead of being a physical custodian of a hierarchically organized collection, he argues that digitization recasts the museum as largely horizontal in nature, which focuses on an "infinity of aesthetically equal images."[380] Here, curation can be performed by algorithms, instead of by individuals, and the content of those networks are largely governed by proprietary databases. The museum then becomes transformed as a result—structured less like a place of playfulness, scholarship, and preservation—and more like a consistent, atomic, and searchable database.[381]

While a selection function used to be performed by curators, today, it is performed by algorithms, something that Pepi critically questions because of the way that algorithms might interact with principles of proprietary control and privatization. Consider, as an example, the partnerships between Google Glass and museums, which Pepi argues has transformed a museum visit from an "aesthetic experience" into an experience involving "a hardware apparatus whose proprietary format is dictated by a private company," and which limits the free play of individual narrative as a result.[382] Like the user, curators, conservationists, and directors have very different concerns than a database

377. Pepi, *supra* note 357, at 8.
378. *Id.* at 4.
379. *Id.*
380. BORIS GROYS, ART POWER 16 (2008).
381. Pepi, *supra* note 357, at 6.
382. *Id.*

administrator. "[T]he museum allows us to step out of time," Pepi writes, "whereas the database is by definition obsessed with time."[383]

Even if the museum will not become a database in the literal sense of the word, the "database logic" that pervades the modern museum deserves our critical attention, particularly when we consider the ways in which proprietary concerns can disable public access.[384] Yet, unlike Pepi's critique, I would submit that digitization produces a curious irony: far from rendering a museum irrelevant, the digital realm may make the role of the curator even more important than before.[385] As one scholar argues, "[t]he more data we have access to, the more we need aggregators and entrepreneurs of information."[386] In other words, the paradox that the museum-as-database produces, may be the one that is essential to its cultural survival. We need help in selecting images, and only those who know the databases from which we seek can provide that help. As we amass more and more information, and as information becomes more and more accessible to those with an Internet connection, there is also a greater need for "guidance, classification, or just plain ordering: how else are we going to make sense of all the stuff that bombards us from every possible source?"[387]

The following Section addresses these questions through the introduction of a legal framework that balances concerns for both access and protection.

B. Protecting the Collection

So far, this Article has suggested that museums face a new paradox in today's age of interactivity: the more participatory a museum becomes, the greater the threat to its proprietary control from an endless array of extractive, immersive, and derivative forms of user interactivity. These forms of interactivity can fall on a spectrum of proprietary control, some of which raise few intellectual property concerns if they are governed by expansive licensing restrictions, and others that call into question the reach of fair use protections in a context of unrestricted interactivity.

As I have suggested, these doctrinal questions have real life implications for not just the future of museums, but also for how technology will govern access to culture itself. But these questions can also be answered by looking at the range of the legal strategies associated with database protection and applying them to the protection of the digitized museum. This Section explores how the legal principles governing databases might be harnessed to protect both the

383. *Id.* at 7.

384. *Id.* at 2; *see also* MANOVICH, *supra* note 365, at 218 (discussing the database logic). Others, too, have cautioned this transition into a digital realm. Lane Relyea has noted that a database actually has the effect of weakening, rather than strengthening, ties to a museum collection, making the collection more passive and informational as a result. *See* LANE RELYEA, YOUR EVERYDAY ART WORLD 8 (2013).

385. *But cf.* Pepi, *supra* note 357, at 10–11.

386. Jonathan Freedman, *Whitman, Database, Information Culture*, 122 PMLA, 1596, 1597 (2007).

387. *Id.*

interests of the museum and those of the public domain. As I have suggested above, I am in favor of reconstruing the museum as a hybrid of both archive and database, and then designing a legal solution that encompasses both sets of characterizations, while enabling wider access for public participation.

Although the Supreme Court foreclosed classic copyright protection for a database when it rejected "sweat of the brow" arguments for protection in *Feist v. Rural*, one potential model worth looking to is the common law or *sui generis* protection.[388] In *Feist*, the Court refused to extend copyright protection to compilations that did not show a modicum of creativity in selection and arrangement.[389] Because facts themselves are not copyrightable, and the directories at issue simply arranged the information alphabetically, the Court held that they lacked the requisite degree of originality and creativity in their arrangement.[390] However, even though databases are not copyrightable, they can be protected under common law principles of misappropriation and other legal and extralegal frameworks.

We can use the legal framework of a database to analytically address the paradox museums face. First, any legal solution for a museum must embrace the property-based concept of construing a museum physically as an archive. Like any other archive, then, a museum must still be able to maintain its control over its collection by imposing rules on participants regarding access and use. Here, the law would support time, place, use, and manner restrictions, in any way that a tangible property owner would enjoy, like specific hours for visitation, rules over types of photography used, and restrictions regarding access, particularly for the purposes of preservation and protection of a collection. These sets of rules and restrictions would be largely uncontroversial, since most researchers and participants are well acquainted with the idea that one must pay institutions for access to their collections and be willing to agree to certain restrictions regarding the use of their collection.

Second, any legal solution must also embrace the concept of a museum as a legal database in order to grapple with the thorny proprietary questions that digitization can produce. While Pepi critiques the "database logic" that has pervaded museums, that very logic can also serve as a promising starting place in exploring legal solutions to protect access to the public domain. Databases, too, have had to struggle with limited forms of intellectual property protection, and the debates regarding their regulation can be instructive in studying ways to address interactivity. Here, protecting the intellectual property of museums may not necessarily lead to the demise of the public domain, but it requires thoughtful regulation and a willingness to integrate the concerns of users with those of the institutions they patronize.

388. *See generally* Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340 (1991).
389. *Id.*
390. *Id.*

As I have suggested, a thorny set of questions stems not just from the physical use of an archive, but rather from what happens after the digitization of the collection occurs. As James Gibson has explained, the digitization of the database invites new possibilities for architectural design—the dereifying of data, "freeing them from the static mold of the print directory; the end-user, not the compiler, determines the arrangement."[391]A digital database, used by many museums to showcase their collections, offers a host of possibilities for wider engagement with the public. Here, as I have suggested, the models of interactivity—extractive, immersive, and derivative—pose difficult questions regarding the reach of proprietary control, but they can also revitalize the role of institutions that willingly embrace their potential.

Consequently, the law's evolution towards *sui generis* protection for databases might provide us with a sketch of some possibilities. To note, this final Section is not meant to offer an exhaustive or comprehensive solution to the issues surrounding digitization in museums. To be sure, there is a vast literature on database protection, much of which covers the legal and international issues in great detail.[392] Undoubtedly, there will be hard cases and complex questions to explore. Ideally, one would hope that more and more museums would opt for market-based contractual solutions, like those put forth by Creative Commons or a related entity that focuses on enabling contractual solutions that focus on access instead of control.

However, these questions have been dealt with in the context of database regulation with surprisingly promising results. Like the issues that museums face regarding works that have fallen into the public domain, databases are often subject to little or no copyrightability.[393] And yet they have managed to carve out areas of protection while posing some possibilities for greater public access. Since copyright protection has been foreclosed for compilations in the database context, we can look towards extralegal, *sui generis* solutions, like those put forth by Anthony Reese, who supports the idea of granting rights in reproduction photographs to museums for a limited period of time, perhaps somewhere between five and twenty-five years.[394] Significantly, Reese supports granting a smaller scheme of rights than those granted under Section 106 of the Copyright Act by limiting protection only to uses that actually recapture all or part of the museum's photograph, and not to those that are independently produced (even when they imitate the museum's photograph).[395] This limitation is similar to the limitations for sound recordings, which protect reproduction and adaptation

391. James Gibson, *Re-Reifying Data*, 80 NOTRE DAME L. REV. 163, 182 (2004).

392. *See, e,g.*, Yochai Benkler, *Constitutional Bounds of Database Protection: The Role of Judicial Review in the Creation and Definition of Private Rights in Information*, 15 BERKELEY TECH. L.J. 535 (2000); Gibson, *supra* note 397; John Hayden, Note, *Copyright Protection of Computer Databases After* Feist, 5 HARV. J.L. & TECH. 215 (1991).

393. *See generally Feist*, 499 U.S. 340 (holding that white pages are not copyrightable).

394. *See* Reese, *supra* note 229, at 1048–49.

395. *Id.*

rights, but only to the extent that they actually recapture the original recording, and not to those that imitate or simulate the recording.[396] By drawing this distinction, Reese ostensibly aims to honor downstream uses of a work. For similar reasons, he also draws a distinction that would limit a museum's protection only to uses that reproduce the photograph so that the museum could still retain profits from ordinary reproductive uses like slides, catalogs, prints, posters, and other nonexpressive reproductions, but retain allowances for derivative and transformative uses like a Warholesque treatment of the Mona Lisa.[397] Finally, Reese also sets up a deposit requirement so that the work could be available from a central repository after the expiration of the *sui generis* protection.[398] Reese's solutions, I think, do an excellent job balancing the monetary interests of a museum with the access rights of the public.

In addition, such a solution might not be needed with the adoption of a compulsory licensing solution, such as the one that appeared in an early draft of an EU proposal for database protection, and which combined both copyright and *sui generis* approaches, but, importantly, also tried to integrate the concerns of users who could not obtain the material from another source.[399] This earlier EU proposal, which aimed to integrate the interests of both users and database developers, included a provision that prevented "unfair extraction of the contents" of the database, but it also forced database owners to provide limited, renumerated access in certain circumstances.[400] It also stated:

> Notwithstanding the right provided for . . . to prevent the unauthorized extraction and re-utilization of the contents of a database, if the works or materials contained in a database which is made publicly available *cannot be independently created, collected, or obtained from any other source*, the right to extract and re-utilize, in whole or substantial part, works or materials from that database for commercial purposes, shall be licensed on fair and non-discriminatory terms.[401]

The applicable provision prevented "unauthorized extraction and reutilization of the contents," but only as long as the source material could be

396. *Id.*

397. *Id.* at 1049.

398. *Id.*

399. *See* Jane C. Ginsburg, *No "Sweat"? Copyright and Other Protection of Works of Information After Feist v. Rural Telephone*, 92 COLUM. L. REV. 338, 383–84 (1992) (discussing the EC Commission Proposal for a Council Directive on the Legal Protection of Databases); *see also* Jane C. Ginsburg, *Creation and Commercial Value: Copyright Protection of Works of Information*, 90 COLUM. L. REV. 1865 (1990) (discussing the need for database protection). For an excellent comparative treatment on database regulation, see Daniel J. Gervais, *The Protection of Databases*, 82 CHI.-KENT L. REV. 1109 (2007); Jacqueline D. Lipton, *Wikipedia and the European Union Database Directive*, 26 SANTA CLARA COMPUTER & HIGH TECH. L.J. 631 (2010).

400. *See* Ginsburg, *"No Sweat"?*, *supra* note 399, at 384.

401. Proposal for a Council Directive on the Legal Protection of Databases, art. 8(1), 1992 O.J. (C 156) 9 (emphasis added), *quoted in* G. M. Hunsucker, *The European Union Database Directive: Regional Stepping Stone to an International Model?*, 20 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 697, 738 n.199 (1997) (discussing sole source data and compulsory licensing in a previous proposal).

"independently created, collected or obtained from any other source."[402] This latter part is especially significant because of its identification of "sole source" material, defined as content that cannot be obtained elsewhere or from another source. If the material could not be independently created or obtained, then the draft Directive required the entity to license the material to the user.[403] Somewhat similarly, the draft also included a provision for a compulsory license if "the database is made publicly available by a public body which is either established to assemble or disclose important information pursuant to legislation, or is under a general duty to do so."[404]

Unfortunately, those provisions did not make it into the final document creating database protection in the EU, largely because some people considered these provisions to be too controversial. To some, they unacceptably expanded the rights of users.[405] But they do serve as a powerful guideline for how we might consider ways to creatively address the institutional disjunctions that I have discussed between technology, access to art, and intellectual property restrictions. While the problems I have discussed might seem, at first glance, to raise abstract questions, the draft of the Database Directive suggests that there are realistic, doctrinal solutions that can be limited in nature, and yet carry surprisingly robust ability to protect both the interests of the user and of the institution.

Like the circumstances the draft Directive envisioned, a museum is often the sole source of archival and artistic material, and therefore is in a position to deny access or to charge supracompetitive prices for licenses to its artworks. Since the material is unavailable elsewhere, there is no way around a museum's refusal to license the material, which leads to a virtual monopoly in not only the material included in a database, but also a corresponding monopoly in any downstream works derived from the original source. And this leads to a potential harm in consumer welfare.[406] As one commentator argued,

> This power to control the dissemination of sole-source data enables the first database maker not only to charge monopolistic fees for access to the database, but also to charge monopolistic licensing fees, if the database maker chooses to license at all, to fair followers seeking to use

402. *See* Ginsburg, *"No Sweat?"*, *supra* note 399, at 384 (quoting Proposal for a Council Directive on the Legal Protection of Databases, *supra* note 407, art. 8(1)) (internal quotation marks omitted).

403. *Id.*

404. *See* Miriam Bitton, *Exploring European Union Copyright Policy Through the Lens of the Database Directive*, 23 BERKELEY TECH. L.J. 1411, 1434 (2008).

405. *See id.* at 1438; *see also* Hunsucker, *supra* note 401, at 758–59 (noting that the more restrictive measures were replaced with a series of optional "fair use" shields that honored limited allowances for research, teaching, and other noncommercial uses, but that also faced criticism for their overly protective character).

406. *See* Daryl Lim Tze Wei, *Regulating Access to Databases Through Antitrust Law: A Missing Perspective in the Database Debate*, 2006 STAN. TECH. L. REV. 7, 23 (2006).

the sole-source data in a competing or value-added product.[407]

The very same risks are present in the museum context, because a museums can often deny access to its collection, even when the work falls within the public domain. And it is often the only source of the material that is being sought. To address this issue, the draft Directive envisioned a compulsory licensing solution; in this context, we can apply it in order to ensure access to a work if it cannot be obtained elsewhere, but also to ensure that a museum retains some degree of revenue from its own reproductions. Like the draft Directive requires, the royalty rate would be set at a fair amount, and a museum would be required to license the artwork to the user.

This solution is admittedly imperfect, because it strikes what some might see as an artificial balance between proprietary control and open access. But it also allows for the recognition of the unique gifts within a museum's collection and also ensures some remuneration for its openness. And it is also possible for this solution (which is admittedly oriented towards databases in particular), to address some of the challenges related to the protection of the physicality and materiality of artworks. So we could imagine an allowance for access in "sole source" material, as the Directive suggested, but we could also augment it with specific guidelines and protocols for the handling of such material to comport with the museum's wishes. Here, we can look to the world of archival protocols for guidance, which have long sought to balance access with concern for the preservation and protection of single-source materials.[408] The important point here is that, by viewing a collection through the lens of a database and an archive, we can come up with greater possibilities to balance a museum's public commitments with its proprietary concerns.

In a perfect world, museums would not be forced to choose between open access and protecting their revenue streams, because their sources of income would be much more robust. And yet, as this Article has argued, many museums are recognizing the tremendous value that inheres in user participation and interactivity. At the same time, however, many museums are not in the financial position to be able to open their collections to the public without some assurance of an income stream. Yet if the law cannot step in to ensure that museums are publicly funded and protected, a solution like that envisioned by the draft Directive may be the best way forward in balancing access with ownership—a solution that deserves further consideration.

CONCLUSION

As this Article has argued, the central paradox defining technoheritage is a legal one that demonstrates the need for us to think more expansively about how

407. Hunsucker, *supra* note 401, at 750.

408. *See, e.g.*, *Typical Usage Guidelines in Archival Repositories*, SOC'Y AM. ARCHIVISTS, http://www2.archivists.org/usingarchives/typicalusageguidelines [https://perma.cc/39W9-G3Y9] (listing typical guidelines for archival access).

to protect cultural institutions that are rapidly becoming digitized along with the substantial public interest in a vital and protected public domain. In an age of public participation, we must enable our democratic principles to define the path of technology, rather than allowing proprietary concerns to control our access to cultural institutions. Reframing our way of thinking about technoheritage as an amalgam of different tangible and intangible interests may be one necessary step in reconciling these concerns, especially if our cultural institutions are meant to flourish in an age of unprecedented interactivity.