



# ART HISTORY NOW: INSTITUTIONAL CHANGE AND SCHOLARLY PRACTICE

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**ABSTRACT** | The way information is structured and accessed has direct and indirect influences on how knowledge is produced from it. Those working in libraries, archives, and museums are well aware of this fact, as much of their expertise is focused on managing the interactions between their own domains and systems—those of art-historical information—and the domains and systems in which art-historical knowledge is produced, by curators, professors, critics, and other practitioners of art history. We know that computing technologies—in their use to manage art-historical information, in researching and writing art-historical scholarship, and in making works of art as well—raise questions that as a field we have yet to fully grasp or articulate, much less answer. This article provides a brief overview of the domain and systems of information management and consider how our information infrastructure has changed over the last twenty or so years. This overview will provide a means for exploring the implications of changes in our information infrastructure for the researching and writing of art history.

**KEYWORDS** | scholarly workflow, infrastructures, collections, information management

The way information is structured and accessed has direct and indirect influences on how knowledge is produced from it. Those working in libraries, archives, and museums are well aware of this fact, as much of their expertise is focused on managing the interactions between their own domains and systems—those of art-historical information—and the domains and systems in which art-historical knowledge is produced, by curators, professors, critics, and other practitioners of art history. Although many producers of art-historical knowledge also know that these two domains shape each other, I would argue this is an intuitive awareness, rather than conscious or critical consideration as to the nature of this interaction or what its implications might be. Most of us have largely internalized the processes by which we conduct research and produce scholarship. As a result, we have perhaps not realized the extent to which the creation and use of systems of information management have shaped and continue to shape the field of art history as we know it. These systems provide the framework for all of the activities we undertake as scholars, from research to analysis, from writing to publication. A persuasive case has been made previously for the constitutive role played by photography in

the formation of art history as a discipline;<sup>1</sup> computational methods and digitized information are exerting a similarly profound epistemological reorientation of our discipline.

Even if we have thought about the interactions between information management and knowledge production, most of us likely think of this as a more or less static relationship, rather than the dynamic, rapidly changing one that it most certainly is. These two spheres are not entirely separate, nor are the boundaries between information and knowledge always distinct. Moreover, the systems by which art-historical information is produced and made accessible and the role they play in the research process change continuously; recently, the pace of change has arguably quickened, following the emergence of the personal computer and the Internet. As a result of these technologies, information management is increasingly dispersed across different institutions and domains of practice. It is decentralized and aggregated, and authority is communicated increasingly through the information itself, in how it is arranged and expressed, rather than through the institutions that create or manage access to it. These and other changes in library, archive, and museum

practice influence how we find information about artworks, as well as what terms we do (or do not) use for searching for them. They influence also the research questions we are able to ask and how we ask them. They impact our ability to, for example, know we are “done” researching, how we interpret information and stage arguments, and how we share our insights. All of these aspects of the research process are profoundly affected by the scales and types of information, as well as the means of accessing it, that are available to the field.

We know that computing technologies—in their use to manage art-historical information, in researching and writing art-historical scholarship, and in making works of art as well—raise questions that as a field we have yet to fully grasp or articulate, much less answer. As we consider the effects of such technologies, it is not merely important to explore whether or how new tools or approaches could be brought to bear on research and scholarship; it is equally, if not more important that we consider how technological change presents challenges to traditional research practices, including how we gather evidence and construct arguments. In particular, we should address the more basic, fundamental questions that institutional change raises, such as: when or how does information (the factual, the neutral, objective, standardized) become knowledge (the interpretative, subjective, particular)? And how are the roles of institutions vis-à-vis individual scholars in this process changing as a result of technological shifts? To address such questions, scholars must develop a better understanding of information management—its institutions and professions, its systems, and processes—as well as familiarize themselves with the ways in which the professions and practices associated with them are changing. In what follows, I provide a brief overview of the domain and systems of information management and consider how our information infrastructure has changed over the last twenty or so years. This overview will provide a means for exploring the implications of changes in our information infrastructure for the researching and writing of art history.

## The “Humanities Problem”

Our current information ecosystem is a result of changes that have long histories that predate computing and that have been shaped as much by a profusion of physical objects as digital ones. The challenges of managing bibliographic collections, for example, in many ways drove the invention of computing. In the early twentieth century, library professionals became concerned about what they called the “library problem,” produced first by the growth of mass market publishing in the 1930s and then by the explosion of information technologies in the postwar period (Figure 1).<sup>2</sup> One strategy for tackling this problem was to

apply computing power to the organization and storage of bibliographic information, beginning with punched cards in the 1940s and 1950s and continuing through the 1980s and the creation of the computer-based (and eventually the online) library catalog.<sup>3</sup> As librarian Robert M. Hayes noted in 1985, “historically there has been a recognition of the ‘library problem’ as an application of the computer, and that the library problem has in fact influenced the development of the computer.”<sup>4</sup>

Of course, this cycle played out in earlier eras as well and indeed continues even now: evolutions in information systems (that is, the means by which libraries manage and provide access to collections) are spurred by the need to manage growing and increasingly complex stores of information; improved information systems, in turn, facilitate the production of more information. Moreover as systems change, so too do institutional policies and procedures, and also professional practice, as librarians and archivists adapt methods and standards for encoding information to new infrastructures and workflows. The MARC or MACHine Readable Cataloguing format, for example, was created in the 1960s to facilitate computer-based cataloguing, and was followed by updates to the standards governing how information should be entered into systems.<sup>5</sup> Controlled vocabularies, naming authorities, and thesauri, all ways of standardizing and disambiguating information in bibliographic, museum, or archival records, have continually evolved alongside innovation in information systems as well.

The best way to apply such standards is not, however, always straightforward or obvious, and processing collections is an inherently interpretive act. Cataloguers are often required to use their own judgment in making decisions about which artistic movements should be used to describe a particular collection, for example, and standards can impose or perpetuate cultural and other biases. Such decisions influence how we research for things and what we find when we do. As librarian Hope A. Olson has noted, because library classification systems are based to a large extent on cultural norms, “users seeking material on topics outside of a traditional mainstream will meet with frustration in finding nothing, or they will find something but miss important relevant material.”<sup>6</sup> Each act of interpretation about how a book or document is described, classified, catalogued, and accessed has ripple effects that are felt downstream, at the point when a patron is searching a collection. As visual theorist and cultural critic Johanna Drucker argues, “models of knowledge in [art history] are being made daily—through digitization projects, prototypes of archival production, virtual rendering, image study, metadata production, classification schemes, and finding aids.”<sup>7</sup> In this way, the production of art-historical knowledge begins, not at the moment an art historian accesses a book or archive, but rather, the moment when a librarian or archivist processes it.<sup>8</sup>

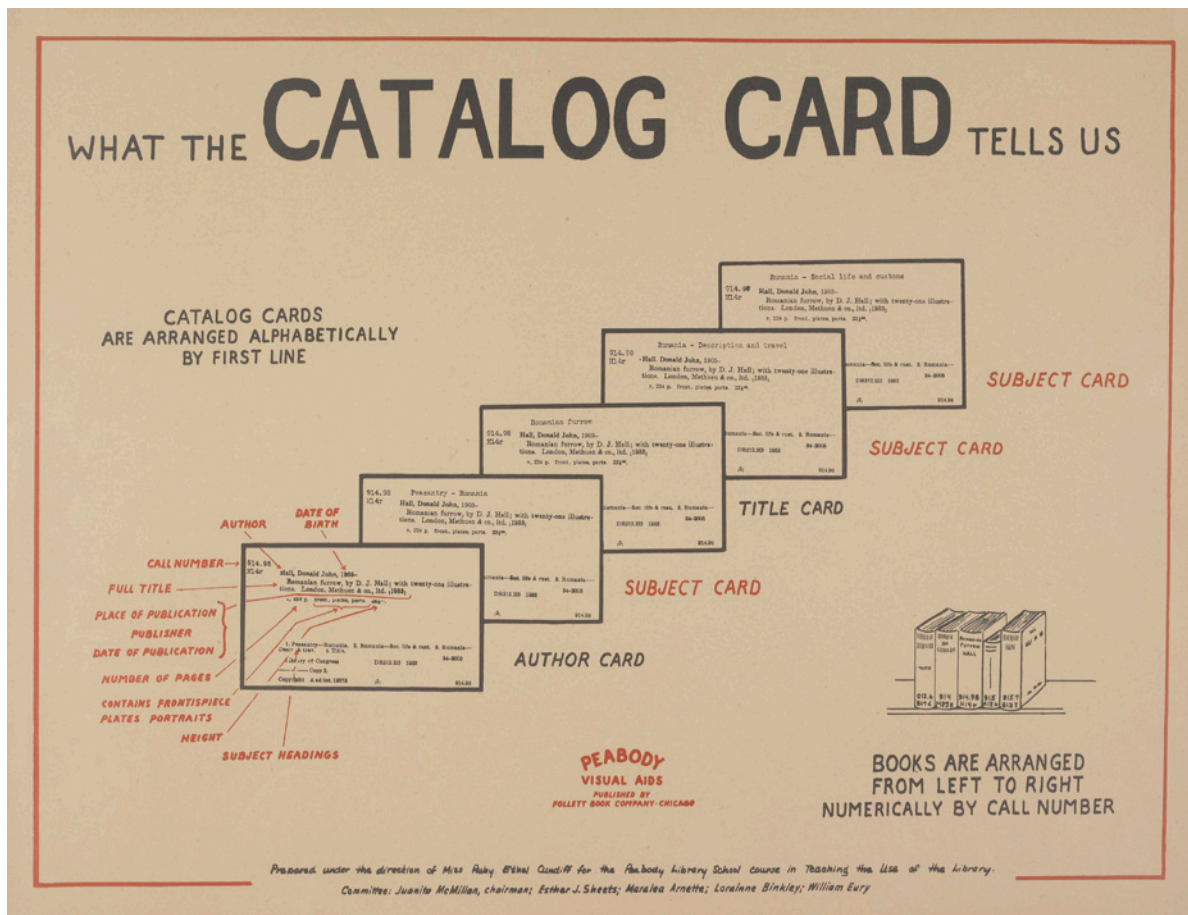


Figure 1. One of a series of posters created by a team working with librarian Ruby Ethel Cundiff at the Peabody Library School in the 1930s, as the “library problem” began to grow more urgent. Card-based bibliographic indexing was introduced to replace the manuscript-based library index and was replaced by computer-based indexing beginning in the 1960s. Image produced by Gabriel Jaramillo at the Claremont Colleges Digital Library.

The work of academic art historians, curators, and other scholars exists on a continuum with that of the archivist, librarian, and other information professionals. Yet, the interconnectedness of these two domains of practice has been obscured by decades of specialization and codification of practice. Until quite recently, most art historians existed in a world dominated by physical documents rather than machine-processed information or data. Those accessing repositories did not, generally speaking, need to know too much about how bibliographic or archival data was created, or about the systems it moved in and out of. The world of data existed largely behind the online catalog screen. However, the past twenty or so years have been characterized by the rapid growth in scale and complexity of this information workflow.

Archival collections related to contemporary art, for example, are noteworthy for the wide ranges in the types of objects and materials found within them. The Harald Szeemann Papers at the Getty Research Institute (GRI) includes thermal fax paper, a bottle of olive oil, and an 1920s-era appliance for perming hair (Figure 2).<sup>9</sup> Also included are original artworks, such as examples of mail art by James Lee Byars comprising envelopes filled with materials like seeds, glitter, or red powder, which are designed to spill out as the envelopes are opened. Audio

visual materials make up a growing proportion of archival collections, as video, film, and audio recordings of the 1960s and later increasingly pass into the realm of art history. The archive of the performing arts center The Kitchen, acquired by the GRI in 2014, contains over 5,000 separate audio and video recordings in formats including 3/4-inch U-Matic, 1/4-inch audio tape reels, Betacam, MiniDV, digital audio tape, and Hi8. Future collections are likely to contain an ever-wider variety of materials as the archives of contemporary artists, many of whom pushed genre boundaries and/or worked with unusual materials, begin to arrive at repositories.<sup>10</sup>

While it is difficult to conclude that, in general, archival collections are getting larger, there has been a trend at the GRI in this direction. In 2011, when the Harald Szeemann Papers were acquired, it was the GRI’s largest; however, the Frank Gehry Papers, acquired in 2017, is a much larger collection compared with the Szeemann Papers and both are dwarfed by approximately four million images and other materials that comprise the archive of the Johnson Publishing Company, acquired in 2019.<sup>11</sup> Certainly the overall increase in individual artists’, critics’, or historians’ capacities to produce and store information at a greater scale, using personal computers and smartphones, among other devices, will likely have some influence on the size of the archives they compile.<sup>12</sup>



Figure 2. A hair perming device from the 1920s, featured by Harald Szeemann in his 1974 exhibition "Grandfather: A Pioneer Like Us (Grossvater—Ein Pionier wie wir)." Harald Szeemann papers, 1974. Getty Research Institute, Los Angeles, 2011.M.30. Photo: Balthasar Burkhard. © J. Paul Getty Trust.



Figure 3. Motion picture film reel in film canister from Edward Ruscha, *Streets of Los Angeles Archive*, 1974–2010. The Getty Research Institute, Research Library, Los Angeles, 2012.M.2. Photo: Chris Edwards. © J. Paul Getty Trust.

It is not only those of contemporary artists, but virtually every kind of collection, regardless of type or date of origin, is implicated by the increase in digital formats of information. Repositories began digitizing their collections in the late 1990s, and soon thereafter began making them available to researchers online.<sup>13</sup> While at first intended to replace microfilming, digitization is at times the only way to make a particular collection accessible, as in the case of the *Streets of Los Angeles Archive* created by Ed Ruscha. A good portion of this collection of over a half-million photographs documenting major Los Angeles thoroughfares from the 1960s to 2010 exists as photo negatives printed onto motion picture stock and spooled onto film reels (Figure 3); it is inaccessible without digitization.

In addition, born-digital objects and information are making up an increasing proportion of collections. Szeemann's archive includes his own emails, as many archives from now on will. Archives related to architecture can include computer-aided design (CAD) files and Building Information Management (BIM) data. Technical imaging, such as x-ray or infrared photography, produce digital datasets of visual and textual information about all kinds of objects from all eras. Within the category of digital assets found in libraries and especially in archives, there is a wide range of types: image files (e.g., JPGs or TIFs), proprietary software files (e.g., CAD or Photoshop), text files (e.g., DOC, emails), and sound and video files (e.g., MP3, MP4). As scholars consult such collections, the notes and images they compile become part of personal archives of information, along with Microsoft Word

documents, paper notes, digital images, books, photocopies, and other digital and physical formats. These collections bring with them their own challenges with regard to information management; many scholars' smartphone photos of archival documents are mixed in with snapshots of their pets.

While contemporary problems of information management are often discussed in terms of over-abundance or too much information, I would argue that what we are experiencing should be thought of less in terms of too much information, in objective terms; rather, we should regard our current situation as the result of our capacity to *produce* information having outstripped our current tools of managing it. Certainly, the increased production and storage of information creates challenges for the institutions charged with managing it. Digitization, for example, requires repositories to develop additional workflows for processing and providing access to digital objects that are related to but distinct from those for physical objects. Moreover, particularly with the introduction of the Internet, this ecosystem stretches out beyond the bounds of individual repositories. Information or data about art—the creation of such data, its migration and management—has escaped the confines of the online catalog. As a result of this expansion and increasing interconnectedness of the ecosystem of information, the challenges of sorting, storage, and retrieval are increasingly confronted by researchers themselves, who struggle to keep track of growing collections of JPGs and Microsoft Word documents. The “library problem” has become the “humanities problem.”

## Research and Scholarship Now

To confront this “problem” of information management, we should begin by exploring the implications that changes to library and archival practice, and indeed in the nature of the collections themselves, might have for the production of art-historical research and scholarship. Research typically begins with two types of activities: 1) formulating a research question or defining an area of inquiry and 2) conducting primary and secondary research on the question or area of inquiry. These two stages of research are circular and iterative; they do not progress in an orderly fashion, from one to the next. In any case, while the systems and processes of information management have been changing for the past twenty plus years, the field’s research tools, methods, and conceptual models have not, for the most part. Our training has prepared us to conduct research and write scholarship in an information ecosystem that, to a large extent, no longer exists. The resulting gap—between our techniques for search and the nature of the information we are searching—is jeopardizing our ability not only to find information but also to evaluate the value and significance of the information we find.

When scholars search in a library catalog or archival finding aid to identify and gain access to a relevant resource, a book, archival document, or artwork for example, the utility of these indices is measured by how close it gets them to an object of interest. In the case of the library catalog, for example, a search might bring a researcher to a shelf where she might discover additional books relevant to her query but which might not have been included (or noticed) in the catalog search results. “Close” in this context may mean within tens of books: one or more shelves’ worth. As archives are stores of information in their most raw, unprocessed form, the archival finding aid is a less precise instrument of discovery as compared with the library catalog. The finding aid leads a researcher to a box in which there *may* be a folder in which there *may* be a document that sheds light on a particular area of interest. Archival research is defined by the slow, often painstaking process of looking through physical objects, box by box, page by page, to find the flecks of gold in the river sand. We know that this physical search is a necessary part of the process, and therefore are more likely to interpret “close” in relatively broad terms, as a box or series, for example, or even a whole collection.

The growing complexity and scale of information in libraries and archives is placing pressure on library catalogs and on finding aids, impacting their effectiveness as tools of discovery. For example, repositories are spending comparatively less time than they have in the past describing or creating information about collections in an effort to reduce the time it takes to process collections and make them accessible to researchers. The trend towards prioritizing

access, known as “more product, less process” or MPLP, is intended to address the widespread backlog in archival collections that has persisted for decades. Without these approaches, for example, it would likely have taken the GRI much longer than three years to process the Harald Szeemann Papers.<sup>14</sup> However, MPLP also inevitably results in finding aids have less of the collections information, or metadata, that is used to facilitate research and discovery of items in collections catalog.<sup>15</sup>

In part to enhance the levels of description of their collections, librarians and archivists have begun exploring other methods of producing information about them. There is an increasing interest in asking scholars to contribute information to collections on which they have expertise as they are consulting those collections, for example. The correspondence in the Szeemann Papers was digitized and deposited as a continuous stream of documents, without indications of where one letter ends and another begins. Scholars searching through this correspondence could be asked to tag the first and last page of a letter, for example, as they are paging through the documents. Perhaps they could also tag specific letters with the names of who sent them, who received them, or who is mentioned in them, thus augmenting the finding aid. Similar kinds of experiments have been employed for museums’ collections as well, with varying degrees of success.<sup>16</sup>

There are also experiments with computer-generated collections information underway. An effort to digitize a selection of twenty-two shoots from Ed Ruscha’s Streets of Los Angeles Archive, about 20% of the total, yielded over 130,000 images. With existing collection information, search would only be possible by street and date, an approach likely to yield results numbering in the tens of thousands. However, because Ruscha’s team took a systematic approach to their photography of Los Angeles streets, snapping the camera at regular and predictable intervals, precise location information for each image can be generated using computational methods. This approach will enable searching by a street address, placing you within tens of images of your desired location on a reel of images.<sup>17</sup>

For many researchers, however, research begins not with a search of a library’s catalog or archival finding aid, but with searches of Google, of sites like OCLC Worldcat, JSTOR, and of aggregators that search across multiple collections, such as Europeana. Scholars’ training may prepare them to interpret what they find with this kind of Internet-based searching, however it may not. In some cases, scholars may not have access to all the information that provides context for interpreting what they find. For example, it is not always clear what collection information is powering these searches: where did it come from? Was it created by a human or by a computer algorithm (and if so, which one)? If a researcher

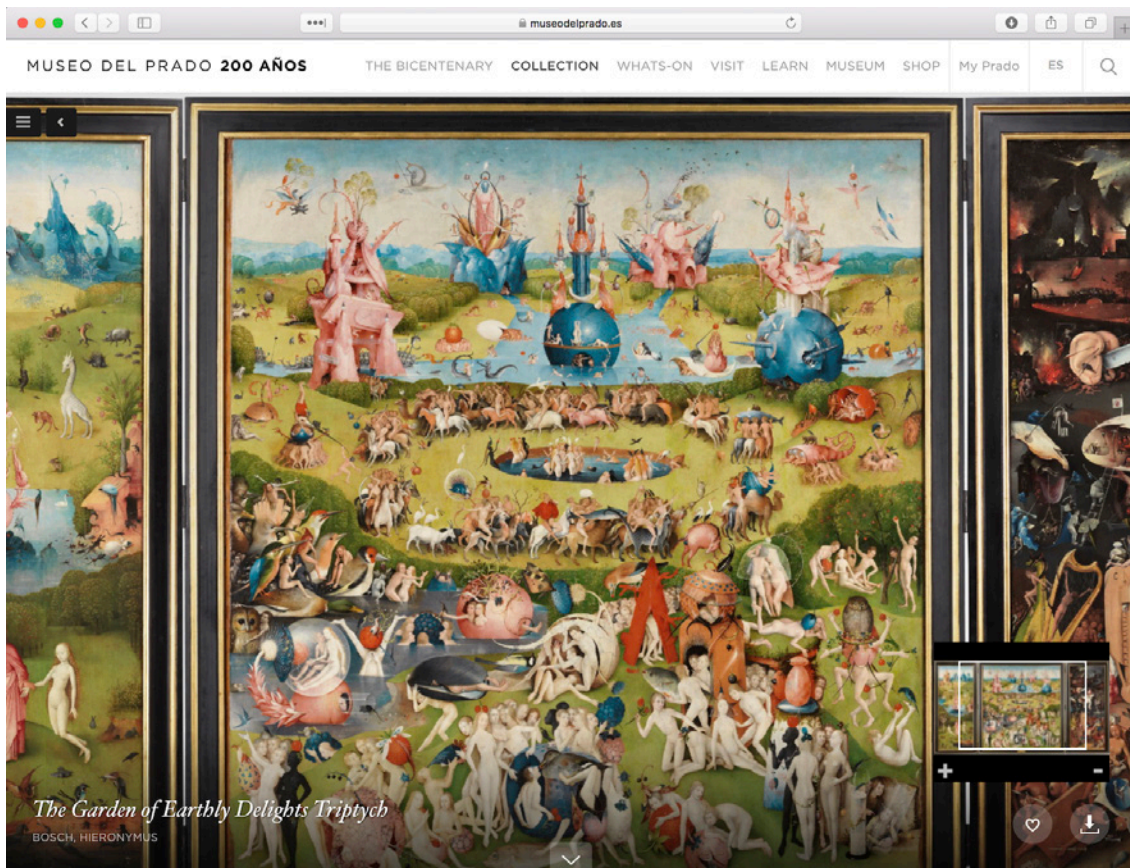


Figure 4. Screenshot of Hieronymus Bosch, *The Garden of Earthly Delights* (1490–1500) as it appears on the Museo del Prado website.

discovers an object through a search of a catalog that was not created by the repository that owns that object, how should this information be regarded or verified? Could it have been manipulated (e.g., edited or reformatted) to fit the requirements of an aggregator like Europeana? Of course, Google searches are tailored to the individual person searching based on information stored in their cookies, the tokens that track their Internet use. When one scholar searches for “Hieronymus Bosch,” the first results she sees might be for the artist, whereas another may first see results related to the fictional detective Hieronymus “Harry” Bosch.

And what about information we discover in other kinds of places? The page on the Museo del Prado’s website dedicated to *The Garden of Earthly Delights Triptych* (1490–1500) includes incredible, high-resolution images of the painting (Figure 4).<sup>18</sup> There is certainly a sense of trust regarding the collection information that appears on the website for such an esteemed institution that moreover owns the object in question. However the page does not tell the viewer anything about who took these photographs of Bosch’s painting or what kinds of post-processing was done on the digital files. Is the image actually a composite of multiple images, as such high-resolution images often are?<sup>19</sup> What technologies are used for the image viewer and how are they interacting with the digital image file? Is the image being adjusted or manipulated in some way (e.g., reduced in quality or broken up into tiles) to fit the parameters of the online viewer?

The answers to such questions may or may not be relevant to interpreting the information scholars find in catalogs, finding aids, or on the World Wide Web. However I would argue that our field does not currently have a good sense of the kinds of questions we *should* be asking, or what kinds of information we *should* ask repositories to provide to facilitate answering them. The Museo del Prado does not offer technical information about the images on its site in part because there is not an expectation within the field that they would do so, nor are there widely known or accepted methods for art historians to interpret such information, even if the Prado did make it available.

There is urgency to our understanding more clearly the potential dangers in ceding our information management in particular to commercial entities, of asking what it means to rely as much as we do on commercial products and companies like Google for information about art history. The reason these questions are more urgent is that the boundaries between commercial and repository-based information management systems are growing less distinct. Twenty or more years ago, search and information was institutionally confined: scholars searched the catalog of the specific library they were either present in or planned to visit, because the goal of their search was gain access to a physical object located there. Today, by contrast, scholars conduct a variety of searches of a variety of different types, across multiple repositories, all



from the same browser window. The point of these searches, moreover, is not always to consult a letter, artwork, or book. The information scholars seek can take a variety of forms, physical or digital, visual, textual, or auditory. Information flows through this Internet-based system in a number of ways. It is not always linked, literally or figuratively, with the repository that created the information, or that owns the item being described.

The tools researchers have at their disposal, by which I mean both the indices of search (catalogs, finding aids) as well as their training, were developed in the era of institutionally-confined searching and moreover designed for searching a particular scale of information. The same indices which got a scholar within tens or even hundreds of objects of a relevant item, may now get her to within thousands, tens of thousands, or even hundreds of thousands of objects of relevance. Instead of getting her to the right street or even neighborhood, she is placed merely in the same country as the intended destination. Is this “close enough”? If as a field we expect to continue with only the tools currently at our disposal, are we prepared to, for example, extend time to degree requirements to allow PhD candidates the time they will undoubtedly need to look through tens of thousands of physical objects, to wander through the country, so to speak, until they find the street or house they are looking for?

It is not only our current tools and methods of search and discovery that may be inadequate to the current information ecosystem, but the conceptual models that inform our research processes as well. Part of art historians’ training is centered on learning the various methodologies for research and analysis but also, and critically, how these methods influence *which* research questions are posed *and* how they are framed. In other words, scholars’ sense of what is possible or even desirable to ask is informed by their awareness of what evidence exists and the various possibilities for making sense of that information. A researcher may choose to investigate a question like “how did the pigments used in Roman panel painting change over the course of decades during the Republic?” Then again she may choose not to pose this question, considering examples of such painting are no longer extant. Her research would have to rely on other kinds of sources and moreover the lack of evidence would limit what it is possible to know about these paintings and the kinds of broader conclusions or insights a researcher would be able to draw. However, with tools of investigation but also of evidentiary analysis evolving, so too is the scope of what it is possible to ask as well as what it is possible to know.<sup>20</sup>

An important part of the research cycle is identifying when to move from formulating questions and conducting research, to constructing and presenting argumentation. Part of how scholars know they are ready to move on, that they have done enough research on a particular topic, has to do with their conception of what the total amount of information

available on a particular topic is, coupled with their sense of whether they have adequately traversed that totality. This is why one sign that research is done, to the extent it ever is, is that the same information keeps coming up again and again, and less and less new information is uncovered. I would argue that both the sheer amount of information available to us and our current tools for researching it are presenting a challenge to our ability to conceptualize the totality of our research topics, much less determine the extent to which we have covered it. Continuing to apply institutionally-confined approaches within a changed information context means that scholars are potentially less able to determine what they are *not* seeing and what they are *not* finding; more concerning, they are not aware of their inability to judge. As a result, we may think we are searching the entire landscape, when we have really only explored one corner of the terrain. We have gone from having some sense of knowing what we do not know, to the illusion of thinking we know more than we do.

Where are the gaps in our information and how can we see them? This is a continually evolving challenge. As noted above, library and archival classification systems shape how researchers search and what they find. For example, art-historical information has in general been ordered in ways that work very well for research on Western European painting, but less well for art works or movements of other types, periods, or traditions. The fields in collection databases, for example, often assume that for each work there is a known, single author, or a limited number of materials. Such databases might strain to accommodate multipartite works, time-based media, or nonbinary gender identification. As art historian Robert S. Nelson argued in 1997, “In the electronic library of the future, new categories and new interrelations will presumably be possible, but the promise of that new world will be realized only if the present is not merely digitized into the future.”<sup>21</sup> Indeed, this is an apt description of the current state of affairs: we are effectively digitizing our field’s past into our technological present.

The difficulty of describing and finding information about objects outside of the early modern Western artistic tradition is compounded in the contemporary context by the fact that the mere existence of computer-searchable information about an object or collection—a digital image or data about collections—has a powerful influence on search, discovery, and thus on visibility. The influence of digital information on discovery has clear implications for the study of domains where there exists less of this kind of information, as in non-European or oral traditions. How, then might the existence of digitized archives, or the lack thereof, be making particular areas of cultural heritage more or less visible? Conversely, to what extent is the current information ecosystem creating an echo effect, wherein artists or collections that are well-known grow more so? And while a surfeit of information on a topic or tradition can magnify our sense of its importance, a dearth of information can have the opposite effect.

Social, economic, and political power structures can become embedded in our modes of information organization and exchange in multiple ways. Part of what is shifting in the wake of changes to library and archival systems and processes, for example, are notions of authority as they relate to information. Notions of authority, how they might be changing but also how and when authority is conveyed, are critical to consider first of all in any kind of online search. As art historian Elizabeth Mansfield has pointed out, “Search engines . . . are designed to give the impression of clarity, authority, and even inevitability: users are only satisfied when they are made to believe that they have, indeed, found what they are looking for.”<sup>22</sup> I would argue that as a whole, our discipline is working with an out-of-date conception of authority, based on institutionally-confined research and on institutions as the primary gatekeepers of objects and information.

Our current idea of authority was constructed in an earlier framework of information management and is reinforced by our perceptions of libraries’ and archives’ neutrality in structuring and presenting information to us. The importance of describing collections in standardized and objective ways, thus making them accessible to scholars regardless of what their research question might be and irrespective of who processed it, is a key principle of cataloguing practice. At the same time, as the work of Hope A. Olson and other scholars from this field have demonstrated, these domains have themselves have been engaged in a lively debate regarding their own neutrality since the 1970s.<sup>23</sup> Moreover, in response to the more open flow of information facilitated by the Internet and the trend towards aggregated and unified searching, libraries, archives, and museums are less likely to view themselves as a single or comprehensive authority on any particular item. Aware they do not have tight control over how or where researchers will encounter the information they produce, information professionals increasingly view authority as something that is vested, not in their own institutions, but rather in communities of practice. Those managing repositories focus more on controlling the formats and quality of that information, that it can be discoverable and meaningful, regardless of the context in which it is found.

The formation of consortia around particular data formats or types is one outgrowth of this trend. For example, a community known as linked.art is creating a shared data model for organizing and expressing information about art as linked data.<sup>24</sup> The International Image Interoperability Framework (IIIF) is another such international consortium, this one comprising libraries, archives, and museums, which is seeking to standardize the way images and information about them are stored and accessed. Efforts like these seek to provide practical, efficient approaches designed to ease the burden of information management for both repositories and individual scholars. Greater adherence to the IIIF

standard, for example, could enable scholars to more easily gather images (and information about them) from across multiple collections. At the same time, however, such efforts mean that decisions about how information is stored and structured are being made by groups in which technologists and information professionals far outnumber scholars of art and architectural history (or related fields), despite that fact that this shift to community- rather than institutionally-created data standards has profound implications for research practice.

A common critique of the digital humanities has been that the field has not generated new insights. As historian Cameron Blevins argued in 2015, “In terms of argument-driven scholarship, digital history has over-promised and under-delivered.”<sup>25</sup> It is hard to argue with this point; however, should this be the only metric for assessing the impact of the digital humanities? One might compare our current moment to an earlier one and ask similar question: Did the 1751 *Encyclopédie ou dictionnaire raisonné des sciences, des arts et des métiers*, edited by Denis Diderot and Jean le Rond d’Alembert, produce new insights? I would argue that Diderot’s and d’Alembert’s achievement was primarily in creating a format for codifying and structuring information, and that, in facilitating the exchange of information, this format created a *framework* in which new insights could be generated. Moving forward in time to 1945, Vannevar Bush, then head of the US Office of Scientific Research and Development, acknowledged the close connection between information access and the production of knowledge in his influential essay calling for innovation in communication systems, “As We May Think.” Bush wrote,

There is a growing mountain of research. But there is increased evidence that, we are being bogged down today as specialization extends. The investigator is a staggered by the findings and conclusions of thousands of other workers—conclusions which he cannot find time to grasp, much less to remember, as they appear. . . . The summation of human experience is being expanded at a prodigious rate, and the means we use for threading through the consequent maze to the momentarily important item is the same as was used in the days of square-rigged ships.<sup>26</sup>

In our contemporary moment, the focused exploration and analysis of the “means we use for threading through the consequent maze” is an incredibly valuable contribution the field of digital humanities has made to our understanding of the practice of humanities research and scholarship. Increasing scholars’ awareness of how these areas of expertise and institutional practice mutually influence one another, and the implications digital technologies have for this relationship, could well facilitate the production of new knowledge, as it ultimately did in Bush’s, Diderot’s, and d’Alembert’s eras.

In our own moment, the nature of what libraries and archives provide to researchers is changing, whether we are aware of or approve of these changes or not. The domains of information management and knowledge production are becoming more integrated and less clearly defined from one another. Because information increasingly appears in formats and places we are not trained to analyze or critique, we are in danger of losing our ability to interpret what we find. Moreover, art historians are implicated more directly and to a greater extent in the processes of structuring, storing, and sharing information than we were previously. When we download the same image file again and again because we cannot find it on our laptop, for example, we are confronting the reality that we are active participants in the maintenance of our field's information infrastructure; we are also feeling

the frustration that comes from not having the proper tools or knowledge to do so effectively. And the challenge of finding information on a laptop is no mundane or inconsequential one. Hard drives are now becoming part of archival collections, including Szeemann's, meaning that looking for JPGs or other files is likely to become a routine activity of archival research. However, our more direct engagement with the management of our disciplinary information also provides us with an opportunity to better understand how this infrastructure shapes the scholarship that we produce and perhaps take a role in managing this process. If we want art history to continue to produce valuable and significant insights about artworks, artists, and ideas about art, we must not only adjust to evolving ecosystems of information, we must participate in shaping them.

## NOTES

- My deepest thanks to the many colleagues, especially those at the GRI, from whom I have learned and who have thereby influenced this essay in both direct and indirect ways. In particular, I'm grateful to Kate Albers, Sam Bibby, Andra Darlington, Ann Harezlak, Elizabeth Mansfield, Marden Nichols, David Newbury, Tracy Stuber, and Karly Wildenhaus for their helpful comments on various iterations of this text. Above all, I thank Murtha Baca for teaching me the incredible value and importance of information and its management. Were it not for my time working and collaborating with Murtha, this essay would not exist!
- 1 See Frederick N. Bohrer, "Photographic Perspectives: Photography and the Institutional Formation of Art History," in *Art History and Its Institutions: Foundations of a Discipline*, ed. Elizabeth Mansfield (New York: Routledge, 2002), 246–59; Costanza Caraffa, *Photo Archives and The Photographic Memory of Art History* (Berlin: Deutscher Kunstverlag, 2011); Robert S. Nelson, "The Slide Lecture, or the Work of Art 'History' in the Age of Mechanical Reproduction," *Critical Inquiry* 26, no. 3 (2000): 414–34.
  - 2 Colin B. Burke, *Information and Secrecy: Vannevar Bush, Ultra, and the Other Memex* (Scarecrow Press, 1994), 99. See also Vannevar Bush, "As We May Think," *The Atlantic*, July 1945, 101–8. The library problem was also known as the "information problem." See Francis Bello, "How We Cope with Information," *Fortune*, September 1960, 162–192. M. E. Maron, "Probability and the Library Problem," *Computers in Behavioral Science*, July 1963, 250–257.
  - 3 See Karen Coyle, *FRBR, Before and After: A Look at Our Bibliographic Models* (Chicago: ALA Editions, 2016); R. V. Williams, "The Use of Punched Cards in US Libraries and Documentation Centers, 1936–1965," *IEEE Annals of the History of Computing* 24, no. 2 (April 2002): 16–33, <https://doi.org/10.1109/MAHC.2002.1010067>.
  - 4 Robert M. Hayes, "The History of Library and Information Science: A Commentary," *The Journal of Library History* 20, no. 2 (1985): 175.
  - 5 MARC standards dictate the content of records, how they are structure, and the fields of classification. Similar standards were created for collecting archival data (e.g., Encoded Archival Description or EAD) and museum data (e.g., Categories for the Description of Works of Art or CDWA).
  - 6 Hope A. Olson, "The Power to Name: Representation in Library Catalogs," *Signs* 26, no. 3 (2001): 639.
  - 7 Johanna Drucker, "Is There a 'Digital' Art History?," *Visual Resources* 29, no. 1–2 (June 2013): 12, <https://doi.org/10.1080/01973762.2013.761106>.
  - 8 Art historian Robert S. Nelson explored the relationship between classification of art historical books and knowledge production in art history his article "The Map of Art History," *The Art Bulletin* 79, no. 1 (1997): 28–40, <https://doi.org/10.2307/3046228>
  - 9 Andra Darlington, the GRI's Head of Special Collections Management, notes that the term "papers" for such collections is increasingly a misnomer. Interview with the author, March 22, 2019.
  - 10 See for example the challenges associated with documentation of the work of artist David Wojnarowicz, as described in Deena Engel and Glenn Wharton, "Managing Contemporary Art Documentation in Museums and Special Collections," *Art Documentation: Journal of the Art Libraries Society of North America* 36, no. 2 (September 2017): 293–311, <https://doi.org/10.1086/694245>.
  - 11 The Szeemann Papers measure 1500 linear feet. The Gehry Papers are still being processed but include, among other items, approximately 120,000 working drawings, over 100,000 slides, and more than 300 models. See "Harald Szeemann Papers," Getty Research Institute, [https://www.getty.edu/research/special\\_collections/notable/szeemann.html](https://www.getty.edu/research/special_collections/notable/szeemann.html) accessed June 22, 2020 and "Frank Gehry Papers," Getty Research Institute, [https://www.getty.edu/research/special\\_collections/notable/gehry.html](https://www.getty.edu/research/special_collections/notable/gehry.html), accessed June 22, 2020.
  - 12 The advent of personal computing and home printing, for example, has led to an increase in document duplication within archives. Andra Darlington, interview with the author, March 22, 2019.
  - 13 Digitization has been driven by a desire to broaden access to collections but is also a strategy for reducing wear and tear on physical objects. Nancy S. Allen, "Institutionalizing Digitization," *Collection Management* 22, no. 3–4 (May, 1998): 217, [https://doi.org/10.1300/J105v22n03\\_23](https://doi.org/10.1300/J105v22n03_23). See also Michael Moss and James Currall, "Digitisation: Taking Stock," *Journal of the Society of Archivists* 25, no. 2 (October 2004): 123–37, <https://doi.org/10.1080/0037981042000271457>. For a more recent exploration on the impacts of digitization, see Christina Kamposiori, Simon

- Mahony, and Claire Warwick, "The Impact of Digitization and Digital Resource Design on the Scholarly Workflow in Art History," *International Journal for Digital Art History*, no. 4 (2019): 3.11-3.27, <https://doi.org/10.11588/dah.2019.4.52795>.
- 14 At the GRI, MPLP approaches were adopted beginning in about 2008, supported in part by a grant from the Council on Library and Information Resources (CLIR). According to Andra Darlington, prior to the adoption of MPLP it was not unusual for collections processing at the GRI to require 20 hours per linear foot. After 2008, this number dropped to about 8–10 hours per linear foot, a number which of course varies depending on the particular collection. Darlington furthermore notes that although more streamlined approaches have been adopted at the GRI, its processing strategies are nonetheless considered far more extensive and detailed in comparison with those of comparable repositories. Andra Darlington, interview with the author, March 22, 2019.
  - 15 Mark A. Greene and Dennis Meissner, "More Product, Less Process: Revamping Traditional Archival Processing," *The American Archivist* 68, no. 2 (September 2005): 208, <https://doi.org/10.17723/aarc.68.2.c741823776k65863>. In research conducted by Greene and Meissner for their article, 34% of repositories they surveyed reported that over half of their total holdings were unprocessed and thus unavailable to researchers, whereas 88% considered an "acceptable" backlog as one consisting of less than a quarter of total holdings unprocessed. Greene and Meissner, 210–11.
  - 16 See for example Daisy Alioto, "Can Social Tagging Deepen the Museum Experience?," *Hyperallergic*, November 3, 2017, <https://hyperallergic.com/409854/can-social-tagging-deepen-the-museum-experience/>; Andrew Lih, "Combining AI and Human Judgment to Build Knowledge about Art on a Global Scale," *The Met Museum Blog*, March 4, 2019, <https://www.metmuseum.org/blogs/now-at-the-met/2019/wikipedia-art-and-ai>.
  - 17 The Streets of Los Angeles Archive is now accessible via the GRI's Research Collections Viewer, <https://www.getty.edu/research/collections/collection/100001>, and on the website 12 Sunsets, <https://12sunsets.getty.edu/>. For another example of experimental approaches to archival processing, see Mary O. Murphy et al., "Failure Is an Option: The Experimental Archives Project Puts Archival Innovation to the Test," *The American Archivist* 78, no. 2 (2015): 434–51. In addition, the effects of the 2020 COVID-19 crisis have placed additional attention on methods of digital-first (as opposed to physical-first) processing. See Karen Smith-Yoshimura, "Metadata Management in Times of Uncertainty," *Hanging Together: The OCLC Research Blog*, June 15, 2020, <https://hangingtogether.org/?p=7998>.
  - 18 "The Garden of Earthly Delights Triptych," collections page, Museo del Prado, <https://www.museodelprado.es/en/the-collection/art-work/the-garden-of-earthly-delights-triptych/02388242-6d6a-4e9e-a992-e1311eab3609>, accessed March 16, 2019.
  - 19 It should be noted that no objectively defined standard exists for what constitutes a "high-resolution image."
  - 20 One clear example of this is the field of art market studies, where analysis of sales data has opened up areas of inquiry that are helping us gain a more accurate and detailed picture of the economics of art, particularly in the nineteenth century and earlier. See for example Sandra van Ginhoven, *Connecting Art Markets: Guiliam Forchondt's Dealership in Antwerp [c.1632–78] and the Overseas Paintings Trade* (Leiden: Brill, 2016); Lea Saint-Raymond and Antoine Courtin, "Enriching and Cutting: How to Visualize Networks Thanks to Linked Open Data Platforms," *Art@s Bulletin* 6, no. 3 (November 30, 2017), <https://docs.lib.purdue.edu/artlas/vol6/iss3/7>.
  - 21 Nelson, "The Map of Art History," 33.
  - 22 Elizabeth C. Mansfield, "Google Art Project and Digital Scholarship in the Visual Arts," *Visual Resources* 30, no. 1 (2014): 115, <https://doi.org/10.1080/01973762.2014.879409>.
  - 23 In addition to Hope A. Olson's essay "The Power to Name," see Sanford Berman, *Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People* (Metuchen, NJ: Scarecrow Press, 1971); Emily Drabinski, "Queering the Catalog: Queer Theory and the Politics of Correction," *The Library Quarterly: Information, Community, Policy* 83, no. 2 (2013): 94–111, <https://doi.org/10.1086/669547>; Anne Gilliland, "Neutrality, Social Justice and the Obligations of Archival Education and Educators in the Twenty-First Century," *Archival Science* 11, no. 3 (November, 2011): 193–209, <https://doi.org/10.1007/s10502-011-9147-0>.
  - 24 To learn more about linked.art, visit <https://linked.art/>, accessed March 29, 2019. It should be noted that linked data is viewed as an appealing to approach to many information professionals precisely because it can move more freely in and out of information systems, in contrast to information compiled in databases.
  - 25 Cameron Blevins, "The Perpetual Sunrise of Methodology," blog post, January 5, 2015, <http://www.cameronblevins.org/posts/perpetual-sunrise-methodology/>. See also Nan Z. Da, "The Digital Humanities Debacle," *The Chronicle of Higher Education*, March 27, 2019, <https://www.chronicle.com/article/The-Digital-Humanities-Debacle/245986>.
  - 26 Bush, "As We May Think," 101, 102.

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