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## Do Archives Have a Future in the Digital Age?

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## DO ARCHIVES HAVE A FUTURE IN THE DIGITAL AGE?

### Introduction

In the course of their history, archives have gone through considerable changes, facing numerous challenges along the way. These changes have affected archival science and practice alike. Even in the recent past, a host of new archival concepts have emerged.<sup>1</sup> Eric Ketelaar writes of archival turns extending beyond the boundaries of archival science.<sup>2</sup> If we look at the last century, we see paradigm changes in the various fields of archival practice, and if we study the history of archives in its entirety, as Ivan Szekely has done, we are able to identify consecutive archival paradigms with distinctive characteristics.<sup>3</sup>

These changes and new challenges can still be experienced today, and their impacts now seem even stronger than ever before. Most prominent among the causes is the development and spread of new information and communication technologies, or, more precisely, changes in the communication practices of individuals, groups, and institutions, which are subsequently channeled back to reinforce their development. Users seem more and more inclined to take for granted that archives' information and documents are accessible online. Archives can hardly resist the temptation to unload the burden of processing documents on the community of users, while lay users are not particularly bothered by the exact sources of the hits for their searches. Ultimately, even the *raison d'être* of the archives is open to question: if today's network-based information and communication services take over the information processing functions currently carried out by archives, then what need do we have for traditional archives and archival institutions?

In the present article I place emphasis on some of the fundamental elements of these changes, including the relationship between remembering and forgetting, as all archives are, ultimately, memory-preserving institutions. I briefly describe how archival functions have changed in this environment and how these changes have affected the various types of archives and their functioning. Then I list the main information operators that characterize the work of archives and study the key information operators that fundamentally defined the archives' work in successive paradigms of archival history. I demonstrate that internet-based information services can apparently take over en masse all the operators associated with archives.

In the final section I claim that, despite all of the above developments, the need for archives and archival institutions will continue to exist in the digital age. I have six reasons to support that claim: the archives' administrative and cultural embeddedness in the fabric of society; the provision of persistent functions related to data and documents; the task and capacity to preserve physical, nondigital copies; the importance of preserving the historical and information technology context; the long-term task of migrating document formats; and, finally, the significance of archives' institutional responsibility.

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<sup>1</sup> For example, post-custodial thinking, archivalization, communities of memory, community archives, cocreatorship, digital repatriation, and the archival multiverse; see Gilliland, *Conceptualizing 21st-Century Archives*.

<sup>2</sup> In his words, "turns and returns." These turns manifested not only in the domains of philosophy, art, information, and social science but also influenced the very concept of the archive and extended its spheres of interpretation. Ketelaar, "Archival Turns and Returns."

<sup>3</sup> See, for example, John Ridener's categories in *From Polders to Postmodernism*. Szekely, "The Four Paradigms of Archival History."

## Remembering and Forgetting: Norm or Exception?

One brief look back through history might give a superficial impression that remembering has always been the norm, since the capacity to remember has been instrumental in handing down culture, the creation of individual and group identities, the organization and evolution of collective activities, and the functioning of the state, as well as all the other organizations empowered to use force. Under this conceptual framework, forgetting appears merely as a distracting factor, a malfunction in the handling of information, as if humans have always been strived to remember everything.

We rarely appreciate the role and importance of forgetting, even though memory preservation, along with the memory institutions, tends to play a more powerful role in any settings where forgetting is natural and remembering is exceptional and valuable. As Viktor Mayer-Schönberger has put it in his seminal work, up to this point in human history, at the social, group, and individual levels alike, forgetting has been the natural tendency, while remembering has always required resources: time, energy, expertise, technology, and even institutions.<sup>4</sup> However, it was not just the high social costs that made remembering so valuable but also the process designed to select the information to be preserved: that required deliberation and evaluation. At the institutional level, the original acts of evaluation and selection were followed by further rounds of reevaluation and reselection, but until recently this has been the same with the process of preserving our personal memories.

All that seems to be changing now, at the level of overarching declarations by opinion leaders in computer sciences and social scientists dazzled by prophecies of perpetual preservation of all information, at the level of network business models and the marketing industry built around them, and at the level of individuals using modern equipment in information and communication technology alike. These declarations and futuristic visions first appeared in the early works of science fiction—consider H. G. Wells’s 1938 *World Brain*—while Vannevar Bush’s idea of a memory extender, Memex, even had contemporary physical illustrations (although, quite naturally, achieving its complete functionality was not possible back then).<sup>5</sup> The visionaries at the time believed that as a result of unlimited memory capacity, unlimited computing power, and unlimited network density, all the information ever recorded would eventually be orbiting the earth as some kind of public utility system and would be accessible to anybody, at any time.

To achieve such a repository, however, all the information must first be recorded. Such demonstration equipment already exists: one of the pioneers of computer technology, Graham Bell, started to use a device named MyLifeBits to record every moment of his later years, while Steve Mann, one of the pioneers of “wearable computing,” had visual information recording equipment permanently attached to his own body.<sup>6</sup> As the business models and associated marketing strategies suggest, “more information, better decision-making,” and “more

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<sup>4</sup> Mayer-Schönberger, *Delete*.

<sup>5</sup> Bush, “As We May Think.” Bush’s idea inspired several future development projects in information management, or rather, several developers discovered their early archetypes in Bush’s vision. Although these retrospective evaluations placed the primary emphasis on better ways to link and access *existing* information (see, for example, the developments leading to hypertext), an equally important element in Bush’s concept was the ability to continuously record and retrieve the events around us—in other words, the extension of externally recorded memory, which he intended to realize by using a head-mounted camera.

<sup>6</sup> Bell and Gemmel, “A Digital Life”; Wikipedia, s.v. Steve Mann.

information, more efficiency.” These slogans pop up over and over again not only in specialist magazines but also in the mainstream media. The information superpowers of the media have pledged to make all information recorded and retrievable forever.<sup>7</sup> (On the other hand, it is hard not to notice that other newspaper columns talk about massive losses of data from time to time, which is a strange contradiction in light of these utopian promises.<sup>8</sup>) And at the level of practical experiences, the average computer or smart phone user often finds that she has neither the time to separate important and valuable photos from among the innumerable pictures taken nor the patience to sort e-mails and provisional versions of visual and text files. Instead, most people just save them all in the hope that one day they will find the time to look through the lot of them, or that developers will come out with another, even more advanced software solution to help deal with the issue of selection and navigation through the masses of information stored on electronic devices.

### **Archival Functions in the Changing Environment**

A superficial observer may get the impression that the need for memory institutions—museums, libraries, archives, and sometimes cemeteries, memorial parks, and memorial centers—has always existed and will continue to do so in the future. The main functions of memory institutions are well-defined in the public mind, although their activities have never been completely separable. The same applies to the range of memory-preserving entities handled by them: letters may be held in museums while objects are sometimes preserved in archives. In today’s era of “digital revolution,” these functions, too, may go through changes. Institutions may find themselves facing new challenges, and these changes and challenges may partially be caused by technological developments, which not only transform, through their mutual interactions, the functioning of these institutions but occasionally also blur institutional frameworks.

In order for us to review the changes taking place in the archives’ activities and functions, first we need to do two things: determine what “archives” really are and define our reference frame for comparison, in other words, the basis against which we measure these changes. Neither of these two tasks is an easy one. Although several studies, scholarly essays, manuals, and popular articles have been published on this subject, authors do not always have the same angle on their topic, especially in view of the fact that both the subject-matter of the analyses and the approach of the respective authors change with the passage of time. In other words, even contemporary authors may change their views on the essence of archives and the changes we are witnessing in the archival domain. Since the scope of this paper does not allow a deeper analysis of these two fundamental problems, namely the definition of archives and the evaluation of the changes, we must content ourselves with the construction of a reference frame for our further thoughts.

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<sup>7</sup> The most ambitious, and also most practical, demonstration of this concept is the Internet Archive, which stores the archived content of billions of webpages and allows access to it through the Wayback Machine (<http://archive.org/web/web.php>). Of course, there is no talk of “all information” and “forever” here, only about a huge and continuously growing database run by a private nonprofit organization. For its praise, see Barsch, “Preserving Big Data to Live Forever,” a typical post by a marketing director of a leading software company.

<sup>8</sup> Some examples: Steven Musil, “Google Blames Software Update for Lost Gmail Data,” [http://news.cnet.com/8301-1023\\_3-20037554-93.html](http://news.cnet.com/8301-1023_3-20037554-93.html); Vodafone Community Blog, “Lost Internet Data,” <http://community.vodafone.com.au/t5/Windows-Phone-Mobile-Broadband/lost-Internet-data/td-p/419478>; <http://crepuscular.rmlowe.com/2011/04/22/google-docs-lost-my-data/>; e1ven, “Why No Company That Values Their Data Should EVER ‘Go Google,’” <http://e1ven.com/2011/04/14/why-no-company-that-values-their-data-should-ever-go-google/>.

In the functioning of organizations—as in individuals’ private activities—there are certain kinds of data that could be needed at any time on any day (for example, the telephone number of our partners). Other kinds of information are not needed every day, only periodically (for example, last year’s telephone directory, where we could look up the phone numbers of former colleagues). Finally, there are those pieces of data that we no longer need yet do not discard because they contain important memories central to our identity (for example, the registry containing the data of our colleagues working for the company at the time of its founding). Traditionally, we sort these information into three categories: current, semi-current, and non-current. The European notion of “archives” only applies to those documents that have already been transferred from the originating organization to an institution appointed to preserve documents permanently, that is, to non-current documents.<sup>9</sup> In the wording of the Council of Europe’s recommendation,

The word “archives” has the following meanings: (i) when it is written with a lower case “a”: the totality of the documents . . . produced or received by any individual or corporate body during the course of their business and transmitted to the Archives for permanent preservation . . . (ii) when it is written with an upper case “A”: the public institutions charged with the preservation of archives.<sup>10</sup>

The question posed in the present article’s title relates primarily to the archival institutions, that is, archives with an upper case “A.”

Archivists and records managers, originators and users of the archives have all experienced the changes of our times. New types of documents have appeared, such as databases, that have no unique state, as the information to be preserved is constituted by the data and the operational logic together; in other instances, even the borders between related data elements are debatable. Consequently, we have witnessed a shift from document-centeredness to data-centeredness in the conceptual framework of archives.<sup>11</sup> New sources have appeared on the input side of the archives, next to the obligatory institutional transfers and individual donors and depositors: some collections have grown on the basis of crowdsourcing, while others also incorporate users’ feedback in their collections.<sup>12</sup> The ephemeral and transient information reflecting our everyday communication, such as large volumes of e-mails and tweets, force archives to face up to further new challenges. And since there is no time for selection based on merit, at places where the required information technology exists, these are all preserved in the hope that intelligent data analysis techniques of the future will be able to help with selection.

To be able to handle the exponentially growing volume of data and documents, archival institutions have been experimenting with new methods. For instance, some originating institutions retain the data and documents to be preserved and process and preserve the

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<sup>9</sup> The concept of document is broader than the concept of record in the sense of “recordness”: a farewell letter found on the battlefield unsigned and undated obviously does not qualify as a record in that sense, yet for the purposes of a historical archive it can form a valuable document that needs to be catalogued.

<sup>10</sup> “Recommendation No. R (2000) 13” of the Committee of Ministers to member states on a European policy on access to archives. For a detailed account of its provisions, see Kecskemeti and Szekely, *Access to Archives*.

<sup>11</sup> A similar shift has taken place in legislation on access to archival holdings: it is the data contained (for example, personal data or classified data), rather than the document itself, that is the subject of the qualification process determining access or restriction.

<sup>12</sup> One example of this practice is the webpage Yellow Star Houses, created using archival sources by Blinken OSA Archivum (<http://www.yellowstarhouses.org/>), which is regularly expanded through the addition of recollections sent by eyewitnesses to historical events.

material, in accordance with procedures determined by the archival institution. The recommendations of the document lifecycle management are already designed to extend the uniform criteria of form and content of digital data and documents to the originating institutions. Other archives, however, house the documents but leave their processing (tagging, commenting, describing) to crowdsourcing.

In addition to the challenges and new methods applied in traditional archives, new types of archival institutions, such as community archives,<sup>13</sup> human-rights archives,<sup>14</sup> and archives preserving Internet content,<sup>15</sup> now exist, the workings of which can hardly be accommodated to the conceptual frameworks of archival law, that is, the corpus of legal provisions aimed at regulating the activities and responsibilities of public and private archives and the use of archival holdings. Archivists appear to be taking on new roles with an open-minded spirit: in describing, categorizing, and publishing documents, they increasingly assume a more active role. On the users' side, we can see a new development whereby any piece of preserved information can qualify as current, as data mining methods and predictive analysis techniques can produce usable new patterns from old data.

Archivists and record management professionals are familiar with all these changes, which provide ample source-material for expert and philosophical analyses. But as for these new developments, they are “new” compared to what? What can be considered traditional from the viewpoint of the new developments?

It would be a serious case of professional and historical shortsightedness to think that the great changes—the “revolutions” and paradigm shifts—can, of necessity, only happen today, and that the past constitutes a single, homogeneous block. Seen through the filter of the “digital revolution,” the millennia-long history of archives might simply appear to be the “analog” period. However, members of expert bodies, as well as the lay public, are usually not satisfied with experiencing a one-off revolution and therefore continuously demand newer and newer ones: the revolution of memory storage (the amount of which will look ridiculously small before too long) or the revolution of data-processing capacity (even though it will render our notion of “big data” obsolete almost immediately). There are only a handful of theoreticians who view the history of archives as more than a homogeneous block; John Ridener is one, though he admittedly only studies the period from the late nineteenth through the early twenty-first century, dividing it into distinctive periods and paradigms.<sup>16</sup> Likewise, Ivan Szekely distinguishes four successive paradigms in the multi-millennial history of archives: the

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<sup>13</sup> See, for example, Flinn, “Archival Activism,” about independent and community-led archives, or the “Archives and Community Engagement” special section in the Spring/Summer 2015 issue of *American Archivist*.

<sup>14</sup> One outstanding example is provided by the “mug shots” presenting and archiving the Cambodian genocide. Caswell, “The Making of Archives.” Hariz Halilovich elevates the elements of the subjective past to the status of archival records; see Halilovich, “Re-Imagining and Re-Imaging the Past.” Csaba Szilagyi presents the example of “commemorative arenas” constructed by archives; see Szilagyi, “Representation of Mass Atrocities.” Finally, Anne Gilliland thinks that in a certain sense, “all archives are human rights archives.” Quoted in Caswell, “Defining Human Rights Archives,” 209.

<sup>15</sup> The best-known example is the Internet Archive, which to date has made available online more than 279 billion webpages, 11 million books and other text documents, and 3.1 million films and video recordings, as well as countless photographs, audio recordings, software, and other materials. A similar, albeit more focused initiative is the Long Term Preservation Project run by the Bavarian State Library (<https://www.babs-muenchen.de/index.html?c=&l=en>), one goal of which is “long-term preservation of websites in memory institutions,” designed to archive, among other things, the webpages of archives.

<sup>16</sup> What Ridener actually presents is not a history of archives but a history of archival theory, most notably of appraisal theory (his paradigms are consolidation, confirmation and reinforcement, modern, and questioning). Ridener, *From Polders to Postmodernism*.

entitlement-attestation, the national, the public, and the global, in order “to set them apart according to purposes, organizations, owners and target audiences of the archival institutions” and to “specify the key technologies applied, the expertise required and the most typical information technology operations performed, along with the most important practical effects and problems associated with them.”<sup>17</sup>

According to Szekely’s categorization, contemporary archives are situated at the borderline between the public and global paradigms, as characteristics of both are evident in how they function and how their role is conceived. The characteristic features of the transition period between the public and global paradigms are as follows: the convergence of records and archives; the handling of paper-based, digitized, and electronic documents jointly; the simultaneous serving of professional researchers locally and lay users remotely; the convergence of archival laws and information laws; and a shift in the prevalent approach from document-centeredness to data-centeredness. As for the traditional archival institutions, some of the most important dilemmas they face include either maintaining the principles of selection and appraisal or striving to admit all data and documents; insisting on the observation of the rules of processing and working procedures or outsourcing them on the basis of tagging; digitizing collections held on analog storing devices or adjusting to the actual demands of users; providing online access to all digital materials or encouraging researchers to keep alive traditional approaches (such as spending time and energy with onsite research); and, finally, deciding on what constitutes archives’ most important responsibility. Is it to guarantee the authenticity of the documents, to preserve their integrity, or to protect historical truth?

### **Information Operators and the Functions of Archives**

With regard to the defining technological medium of the digital age and the all-pervading phenomenon of datafication, it is well worth studying archives’ functions and the challenges they currently face, with a view to the information operators hidden behind their activities. Operators of different levels are used in information theory, logics, mathematics, functional analysis, formal languages, theory of human language, and other fields of science. It is not our purpose to carry out an abstract analysis of information theory nor to use mathematical formulae or apply the logic of operator theories to the functioning of archives.<sup>18</sup> For that purpose, we prefer the use of high-level information operators that are easy to interpret, that is, the kind that already play a dominant role in the workings of archives.

These are the most important operators that characterize the past, present, and future of archives:

*Recording*—recording of information for long-term use (for example, those in charge of managing ancient archives recorded and coded for themselves the necessary information associated with the production, accumulation, and distribution of goods).

*Coding (encoding/decoding)*—converting the recorded information into commonly accepted forms of representation (for example, the participation of scribes and literate servants was essential in using ancient archives).

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<sup>17</sup> Szekely, “The Four Paradigms of Archival History,” 24.

<sup>18</sup> A useful review of the various approaches in information theory can be found in Burgin, “Information.”

*Structuring*—creating related units of data and documents and organizing their relationships (for example, creating record series and organizing them in thematic or chronological order).

*Storing*—keeping the recorded information for future use (for example, archives, performing preservation activities, attempt to avoid damage and loss of information in the materials).

*Processing*—managing and describing records and documents, creating metadata (for example, creating a Fonds structure and applying international standards for archival description at all levels).

*Making retrievable/accessible*—making documents and other information units accessible for authorized persons or for anyone (for example, creating finding aids or digitizing and posting documents on the web).

*Copying/multiplying*—duplicating or multiplying stored information, not using the process that originally generated it (for example, photocopying or scanning and making digital copies of paper documents).

*Combining*—jointly using information/documents recorded and stored for different purposes, which may result in new information (for example, combining documents containing anonymized personal data may reveal the identity of the persons concerned).

According to the archival paradigm of entitlement-attestation, the dominant information operators of archival activity were recording, coding, and storing.<sup>19</sup> Throughout this long period that lasted right until the end of the eighteenth century, the main purpose of the archives—besides running such current administrative tasks as documenting production, distribution, and tax collection—was to offer legal security and preserve documents. The archival documents confirming ancestry, titles, and ranks; the contracts legitimating the religious and secular authority over people, towns, countries, and empires; and the founding deeds, deeds of gift, decrees, charters, and property titles constituted the fundamental guarantees of the existing order. The servants and agents of archives' creators, of the people exercising religious and secular authority, formed the target audience of the archives. The key element of their activities was secrecy, their key experts were scribes and literate servants, and the key technology was writing (fig. 1).

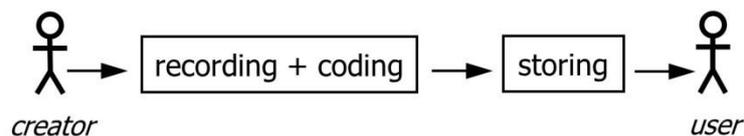


Figure 1. Key information operators in the paradigm of entitlement-attestation archives<sup>20</sup>

<sup>19</sup> With the emphasis on the dominant operators, we do not, of course, mean to suggest that no other operators existed in the archival activities of the period in question, only that they were not crucially important and, therefore, they did not contribute to the identification of the characteristics of distinct paradigms.

<sup>20</sup> The arrows in this and the subsequent figures do not represent the archival workflow but rather general developments in the functions of archives.

In the paradigm of national archives, the operators of structuring and processing hold the greatest significance: this is the period hallmarked by the French Revolution’s document-burning and document-merging activities. This was caused partly by fear that the aristocracy might return (the revolutionaries felt they had to destroy documents legitimating the ancient regime) and partly by the need to introduce new public administration and document categorization structures, in other words, to set up a modern archival policy. During this period nation-states began to undertake the responsibility to foster and preserve national heritage, which some planned to achieve through nationalizing public documents and storing them in a centralized archival system. (In fact, of course, the restructuring of documents often disregarded the logic of the original collection and set up archival systems based on artificial criteria of form and content, thus producing significant loss of context.) The target audience in this case was composed of bureaucrats and historians, with the role of key expert assigned to scholars, bureaucrats, and politicians. The compilation of catalogues became the key technology, along with the publication of sources and the application of metadata (fig. 2).

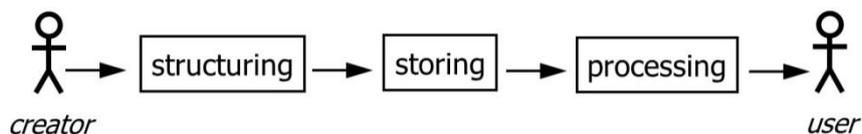


Figure 2. Key information operators in the paradigm of national archives

In the public archival paradigm beginning with the end of the Second World War, the operator “making available” came to acquire a fundamental importance, in addition to and through mutual interaction with the operators of storing, structuring, and processing. This was the period when public archives began to attach importance to the task of serving not only officials and scholars but also the public at large. Archives opened up public research rooms (even in private repositories), where the interested lay public were also given access to the documents of the collections. To be able to achieve that, it was necessary to complete catalogues and metadata with user-friendly finding aids, supply inter-archive references, and develop outreach programs, which became key technologies aiding better access. The main expert became the archivist attaining his or her independent professional prestige (fig. 3).

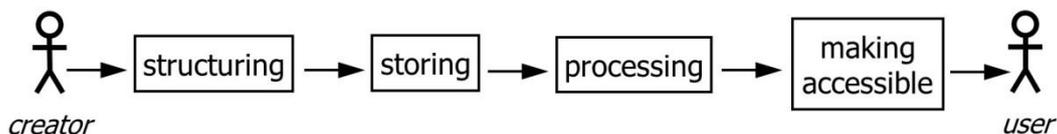


Figure 3. Key information operators in the paradigm of public archives

The global archival paradigm, which emerged in the early twenty-first century and has still not reached full implementation, saw a further addition to the number of crucially important operators (with the initial operators of recording and coding dropped from the list): multiplication. At the same time, the value of originality tends to drop at the expense of usability and accessibility. In the digital world, every copy can be identical (although,

depending on their intended application, the resolution and other parameters can be different).<sup>21</sup> The primary goal has been global access, along with offering services to a mixed but mainly nonprofessional audience. The key technologies here are digitization, computerized processing, and online visibility; the key experts are information technology professionals and information brokers. Internet search engines and online surfaces conceal archival institutions from the majority of remote users: instead of visiting an archive's homepage, users look for answers on Google, and the hits seem to be provided by "the internet," rather than archival institutions. Tech people and the superpowers of the information business, together with techno-optimistic visionaries, prognosticate the perpetual preservation and retrievability of all information (fig. 4).

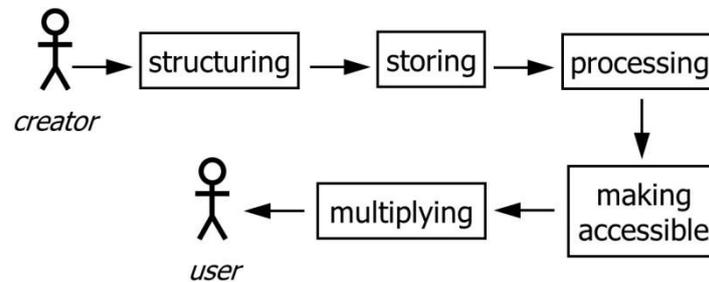


Figure 4. Key information operators in the paradigm of global archives

## Do We Need Archives at All?

Let us review the internet-based information processing services of today and tomorrow from the viewpoint of the above operators (fig. 5):

*Recording*—the users (individuals and organizations) are given the option to generate any new contents they like and to upload existing content to remote servers and the cloud.

*Coding*—the service provider offers users not only storage space but also software that enables them to handle the uploaded information (download, share, modify), while at the technological level, the provider ensures the coding of data in accordance with current standards.

*Structuring*—the contents are stored according to a structure defined by users and at a level comprehensible to them, while at the technological level material is stored according to a secure and shared redundant structure defined by service providers.

*Storing*—the capacity of the storage space is seemingly infinite.

*Processing*—content can be sorted and grouped according to a system defined by the user, with the option to add descriptive data to the various units.

<sup>21</sup> Copying and multiplying have always formed part of the toolbox of memory-preserving institutions. See more on this in Marcus Boon's philosophical meditation *In Praise of Copying*, yet it only became a crucial information operator in the current technological environment.

*Making accessible*—the uploaded content can be accessed anywhere, anytime (this can be limited by uploaders by their own volition).

*Copying/multiplying*—the uploaded digital content can be downloaded and replicated in unlimited number of copies.

*Combining*—the use of modern data analyzing tools makes it easy to combine separately uploaded contents.

According to this, the internet-based services can replicate all the main functions of archival institutions, at least at the level of fundamental information operators, on a mass scale.

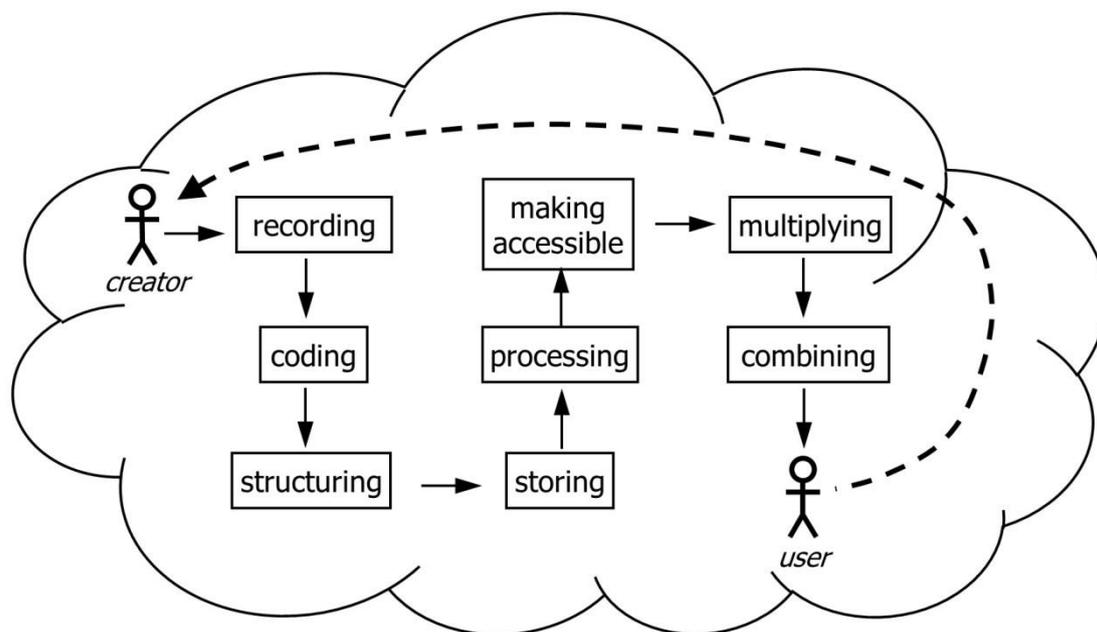


Figure 5. Information operators in the internet-based information services of today and tomorrow

All this is capped by a promise from service providers and techno-optimistic visionaries that further development of these functionalities will continue and that current capacities, including access to uploaded contents, will be made available infinitely. For lay users, this means an unforgetting internet, unlimited storage capacity, continuously growing computing capacity, location- and time-independent mobile access, and autonomous interactive content generation, where the cognitive functions are expedited, or in some cases even taken over, by intelligent devices. In contrast with the expensive and resource-intensive nature of traditional methods of memory preservation, the new world offers simple, efficient, and inexpensive solutions. There will be no more need to pick and choose between the items of data to be preserved, since there will always be sufficient capacity to store all of it, while the intelligent devices of the future will relieve us of the burdens of sorting and retrieving. As for postmodern theoreticians, they in effect are already describing our lives as an archive, where everyone is the archivist of one's own life, while memory institutions only form transient moments of history.

On the basis of all this, for the superficial observer the obvious question remains: if all information is preserved and remains accessible for all times, and if the “internet” takes over the functionalities of the traditional memory institutions, then what need remains at all for institutions dedicated to memory preservation?

### **Why Archives Do Have a Future in the Digital Age**

While we would hesitate to make long-term predictions about social and technological changes on a historical scale, we do believe that, at least looking to the next few decades, archival institutions do have a future in the digital age. We present the following arguments in support of this view:

*Institutional inertia and traditions.* Traditional memory-preserving institutions, especially public ones (public archives, public libraries, national museums, etc.), but to some extent also those privately owned, are deeply embedded in the cultural fabric of society. Public administrations constantly need archives discharging administrative duties. Therefore, the existence of archives is both a public-administration necessity and a cultural value that plays a fundamental role in education and in the creation of artistic products, in international relations, and, more broadly, in the maintenance and formation of communal identity. Although the majority of people who have some susceptibility to the past do not physically visit archives now, nor will they in the future, individuals do enjoy and appreciate the comfort, speed, and simplicity of online access, or at least regard them as basic requirements. Additionally, the relative permanence of established administrative structures, intra- and inter-organizational traditions, and the individual and communal interests and values of the people working in the administration form formidable stabilizing factors in ensuring the survival of memory-preserving institutions.

*Persistent functions of documents and data.* In the course of their long history, archives have ceaselessly changed their function and continue to do so even now. More precisely, the scope of archives’ functions is expanding and the center of gravity of their activities is shifting.<sup>22</sup> The documents they hold (and the data the documents incorporate) have remained, however, unchanged. Naturally, these functions expanded in the course of social and economic evolution, becoming increasingly specialized and, with the spread of digital processing, gaining newer functions, but essentially displaying a long-term permanence. Archivists like to point out that in this respect, a Mesopotamian clay tablet is no different from a modern-day balance sheet, paper-based or electronic. To preserve, search, classify, and describe such a document, archival standards and practices were developed that have been used extensively both in public administration and in business. Of course, this statement primarily applies to archives established for administrative or business purposes, a type of institutions responsible for the *content* of the documents and data they hold. In the case of historical archives, the institution is not responsible for the content of the documents, or more precisely, for the historical authenticity and truthfulness of the documents, as its main responsibility lies in the preservation of their *integrity*.<sup>23</sup> In the case of administrative archives, users mostly want the data and

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<sup>22</sup> For a more detailed discussion, see Szekely, “The Four Paradigms of Archival History.”

<sup>23</sup> In this regard, we might ironically say that the Blinken OSA Archivum, which among others is one of the largest international archives covering the period of communism and the Cold War, is an “archive of lies.” It holds an invaluable collection of documents containing false claims and propaganda material put out by the antagonists of the bipolar world order dominated by the Soviet Union and the United States. With regard to their truthfulness and integrity, the OSA has received a number of highly edifying queries throughout the years; on the handling of these, see Szekely, “The Right to Be Forgotten,” 40–42.

information contained in the documents for the same purposes that the archives originally served—for example, to provide certificates for earlier property ownership. By contrast, researchers in historical archives typically want to use documents and data for purposes other than what those documents were originally intended for: an old payroll once used to record wages paid out might be for a modern researcher a tool to study the language used in the document for linguistic purposes or to carry out cliometric analyses by comparing such documents.

*Preservation of physical copies.* Users sitting in front of their computers or surfing the net on their mobile devices are liable to view the digitized archival documents showing up on their screens as original sources when in fact these were created through digitization of original items made of papyrus, calf hide, celluloid film, or other media. The resolution, richness of details, cropping, color depth, or other parameters of these images depend on the technology used in the digitization process. To understand the full details and birth of this digitized document, then the researcher needs to examine the original item. Similarly, viewing digital copies of a famous painting is no substitute for studying the original in its physical reality onsite, even though digital copies capable of zooming in on details may allow viewers certain scrutiny that is not available to visitors onsite. In addition to the originals' (often irreplaceable) cultural worth, they possess a monetary value, even though it is mostly inestimable, since the recreation of originals is not possible. We must not forget that institutional archives and archival institutions (or memory-preserving institutions in general) store, process, and make accessible not only digital or digitized documents and objects of the present era but also, depending on their mandates, the documents and objects of earlier times. The originals of these must also be stored, and their long-term preservation in good condition ensured. In addition, there are large numbers of documents and objects of permanent value that have not been, and perhaps will never be, digitized.

There are no better places for the safekeeping, expert preservation, and analog and digital copying of these originals than archives backed up by a high level of expertise and professional traditions. Also, despite promises of everlasting digital memory, we actually stand a much better chance of ensuring the lasting survival of a physical document or artwork when we are holding on to the original, as increasingly sophisticated information carriers seem to come with increasingly shorter service lives, something that requires constant attention.<sup>24</sup>

*Preservation of context.* Users who try to access archival documents using internet search engines will get a list of *hits*, while those who elect to search online catalogues of public-domain archival collections will find hits *and context*. Archives are responsible not only for the storage and accessibility of documents and the data contained in them but also the preservation of the interconnections between the data and between documents. The principle of provenance requires the preservation of context, achieved by keeping together documents from the organization, family, or person producing them, while the principle of preserving the original order necessitates the preservation of the existing structure of the documents at the time of admitting them to a collection. These practices combine to create an even broader context, by preserving the operational logic characterizing the organization (family, person) that creates or receives the documents. From a narrower perspective, the application of the descriptive standards of international archival practices help clarify both the internal links

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<sup>24</sup> While the national archives are not in imminent danger of financial ruin or extinction, wars and natural disasters may decimate their collections, and their chronic underfunding may also lead to the material damage of documents. For this reason, the production and safe storage of digital copies is advisable to complement the safeguarding of physical copies, so that even if the originals are destroyed, their digital copies survive.

among groups of documents and the interconnections they have with other groups of documents, including an account of their histories of origin and archival history.

In addition to making use of the hierarchical Fonds structure, modern archives also take advantage of the opportunities offered by computer databases and content management systems in order to create and make accessible further contexts that can serve the requirements and search methods of online researchers. These include special collections (collections compiled according to some specific criteria) or digital repositories, which offer us the option to view documents along different paths, defined by varying logic, without actually losing the contexts associated with these documents in the existing archival structure. Through crowdsourcing operated by archival institutions, where users contribute to the pool of publicly accessible information by their tagging, commenting, and sharing, archives can preserve further layers of context. Such activities can even contribute to the uncovering of interconnections among documents held at different archives, thus rendering the joint activities of archives and their researchers interactive. The internet by itself is incapable of doing that: the only function the online services and remote access can facilitate is to provide access to the contexts uncovered and preserved by archives.

*Migration of document formats.* The majority of the documents held by memory institutions have a permanent format, that is, one that allows access to the documents without any time limitation. Examples of these range from Mesopotamian clay tablets to modern, paper-based documents. In such cases, the only difficulty we may anticipate concerns the decoding of the recorded content (language, writing system, ciphering). The format of the physical specimen does not change, although their condition may deteriorate; stopping or reversing that process is the aim of preservation.<sup>25</sup> The formats of photographs and visual recordings remain comprehensible, although viewing them may require equipment that has already become difficult to come by, such as special-sized celluloid film projectors, VHS players, and slide projectors. In this case digitization means more than just making digital copies for backup; it also becomes a prerequisite for researchers to carry out their work, since they cannot use the original equipment. In the case of digital documents (either digitized or originally created in digital format), however, neither the service life of the carriers (DVDs, Winchesters) nor the functioning period of the format is unlimited. Unless an archive is prepared to maintain a computer museum complete with a running supply of hardware, original operational environment, and computer archaeologists, or to emulate each original software environment in which the documents to be preserved were born, then migrating the documents is the only option. In the course of the migration process, however, the archival institutions not only need to ensure that the documents continue to be technically readable (viewable, audible); they also need to guarantee the materials' continual authenticity and integrity. It is quite unlikely that a document produced in an office software format will still be readable one or two decades later in its original format. When it becomes necessary to convert the original format, the archive will also have to prove that the migrated document is identical to the original one in both form and content—especially when a document holds legal significance.<sup>26</sup> These tasks, which are of an accumulative nature (today we need to migrate yesterday's documents, tomorrow we shall

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<sup>25</sup> Due to shortage of space, in some archives it is customary to transfer large volumes of documents of lesser individual significance to microfilm and then to discard the originals. The use of microfilm, durable as it is, requires both patience and special equipment, which explains the frequent need for a secondary digitization while still retaining the microfilms, because although the microfilms are not the "original" documents, they have a much greater longevity than the digitized copies.

<sup>26</sup> Meeting these requirements in the case of certain types of documents, such as databases and webpages, can be a daunting task.

have to do it with yesterday's and today's), have to be carried out by memory-preserving institutions themselves, even if they do it by contracting an outside agent.

*Institutional responsibility.* In the modern public administration structures, the running of administrative archives (for example, various government organizations' own archives, specialized archives of the state,<sup>27</sup> municipal and national archives) is determined by laws and regulations. There are numerous public administration procedures prescribing the use of archives; elsewhere, the presentation of data or documents retrieved from archives lies in the interests of the clients, for example in litigation. The authority possessed by archives constitutes an important cornerstone of public administration. In a broader sense historical archives—including private archives open to the public—likewise possess an authority, primarily cultural but also with regard to the integrity of documents (although direct legal consequence is rarely associated with documents held in historical archives). The functioning of these archives, too, is regulated in great detail by law, with professional codes and procedures, or archival ethics in general, playing a not insignificant role. Therefore, the institutional responsibility and public work of archives fill an essential social, legal, and public administration need that would argue for their reinforcement, development, and modernization, rather than their scrapping.

## Conclusion

The phenomenon of the information society and its technological background, frequently called the digital revolution, makes the activities of archives both easier and more difficult. Computerized, unified archival management systems, or semi-automated digitizing applications, for example, considerably ease the work of archivists, just as user interfaces linked to these systems lighten the tasks of users. The appearance of new types of documents, the exponentially growing volume of born-digital information to be stored, along with changing expectations of users, on the other hand, present new challenges to both the archival profession and scholars of archivistics. Ivan Szekely's paradigms faithfully reveal that today's target audiences no longer, or at least not overwhelmingly, consist of scholars and bureaucrats; rather, archives have an undefined audience whose members have varying levels of expertise, different expectations and cultural backgrounds, and are more and more focused on demanding remote access to archival holdings. In some respects, the distance between archival institutions and users has been growing: the earlier, more personal and collegial relationship between archivists and researchers is being replaced by more casual and diverse relations as well as a more diversified audience. Most users of archival holdings visit the institutions only in specific cases, for example, if the materials in question have not yet been digitized, or if they need personal consultation in the course of research. In all other cases, users usually prefer offsite research. Such offsite users expect to find hits, rather than context, through internet search engines; some of them do not even want to know which institution has posted the required information on its web page.

We have shown which key information operators defined the functioning of archives throughout the great periods of archival history. These operators—with the exception of the operator of recording/coding by scribes of ancient archives—have survived successive paradigm changes, while further dominant operators have been added. We have concluded that the current internet-based information/communication services have been able to provide each of these processes on a massive scale, and in accordance with users' requirements. In addition,

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<sup>27</sup> One such example would be the specialized archives of the new democracies of Central and Eastern Europe dedicated to the operations of the secret services of the former regimes.

the information operator of recording/coding has made a comeback, and thus the wheel has turned full circle: everyone can potentially become a content provider, archiver, processor, sharer, or creator of new information based on existing data. All this poses the question whether today's internet-based information services will be able to take over the role of archives and archival institutions. In other words, do we still need archives in the digital age?

All the arguments briefly expounded here seem to support the conclusion that the need for the archives will, indeed, continue to exist in the foreseeable future. It appears, therefore, that in the digital age archival institutions are under no direct threat of abolition or loss of function. This does not mean, however, that these institutions—and more broadly speaking the entire field of traditional memory-preserving institutions—do not need to reinvent themselves in order to readjust to the changes in the technological and social sphere and in public administration. The urge to renew is particularly compelling in the case of archives, and it affects almost every aspect of institutions' existence, from archival theory to daily contact with users. The fight for a greater share of resources, together with the need to demonstrate political importance and practical usefulness and to lift professional pride, occasionally result in strange alliances, such as with information business monopolies or the law-enforcement sector, that is, actors and ideologies alien to archival institutions.<sup>28</sup> One thing is certain, however. The memory-preserving institution that is unable to adjust to the demands of the digital era will sooner or later lose its hard-won status and can easily find itself in the archive of archival institutions of the past.

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<sup>28</sup> The French archivists' theatrical manifesto about the dangers of collective amnesia, issued in connection with the European data protection reforms and in protest of the introduction of the metaphorically entitled concept "Right to Be Forgotten" (it was, of course, directed against Google and other information superpowers, rather than archives), is one example. Association of French Archivists, "The European Parliament." Another could be the active participation of the law-enforcement sector in drafting standards for the archival processing of electronic documents, for example in the activities of the Document Lifecycle Management Forum (<http://www.dlmforum.eu/index.php/home/all-events/73-dlm-member-meeting-oslo-norway-15th-16th-november-2016>).

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