Historical Research in the Digital Age: Opportunities and Challenges

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Abstract

Since the advent of the World Wide Web in the mid 1990s, digital technologies have revolutionized historical research. Historians are increasingly relying on computational and digital tools to delve into and write about the past. This paper deals with the potentials and challenges of digital techniques to historical enquiry. Digital technology offers historians accesses to a vast number of sources by a simple click on a mouse. New sites of digitized archives burgeon every day. Manuscripts, letters, photographs, periodicals, books, artifacts, diaries, travel accounts, and newspapers have been published online. Unsurprisingly, historians access a wealth of primary sources from their desktop and save the time and money of tiring archival trips. This abundance of digitized archival sources poses, however, myriad challenges to researchers. Using a "born digital source" raises concerns about the loss of context which is vital to historical research. By relying on digitized fragments of archival material, researchers are increasingly worried about ending up with a decontextualized and invaluable analysis. Digitization implies selection and is not therefore a neutral process. Transcriptions of archival material are often poor and inadequate. There are also increasing concerns about inequalities of access to sources and the longevity and authenticity of digitized archives in an ever-changing digital world. The increasing reliance on digital tools is a direct challenge to the practice of digging around in archives through dust-covered files which is part of the historian's art. Many historians are still not adept enough in advanced digital search techniques.

Introduction

Historians have long complained of the scarcity of sources and the high costs and fatigue of archival trips. The digital age with its tremendous computational tools and electronic resources revolutionized historical research. There is a remarkable "paradigm shift from a culture of scarcity to a culture of abundance."[1]History researchers have access now to an unprecedented wealth of primary sources that have been traditionally housed in remote archives. Diaries, letters, manuscripts, newspapers, and other records have been digitized and made available online. Some of these sources used to be inaccessible due to their fragility. An ever-increasing number of eBooks and online journals are freely accessible. Not only do history researchers have access to an unprecedented bountifulness of sources but also they are reaping the benefits of the new digital tools. Laptops and digital cameras have greatly facilitated note-taking and the collection of sources. It comes as no surprise that an increasing number of researchers are being lured to history. These benefits which the digital revolution has brought into historical research should not, however, be overestimated. The ubiquitous reliance on computational tools and digital devices to probe into the past is fraught with challenges.

Digitized sources are often lifted from their original context. This leaves researchers with a serious lack of contextual information which is crucial to their understanding and analysis of sources. Digitization is also selective and dependent on commercial, financial, and political factors. It is therefore a subjective process. Researchers are often unaware of the non-digitized material and cannot determine its significance for their research. Digital reproductions are often poor and laden with errors. There are also increasing concerns about the longevity and truthfulness of digitized sources amid rapid software and hardware obsolescence. The increasing reliance on digital tools is also a direct challenge to the practice of digging around in archives through dust-covered files which is part of the historian's art. Many history researchers have limited knowledge of digital tools. This paper seeks to highlight the opportunities and challenges which the digital age presents for historical research. An analysis of this two-sided aspect of the digital age and its impact on historical research is inextricably linked to current debates about the present and future of digital history.

1.The Digital Revolution and Historical Research: Opportunities

The increasing reliance on computational and digital tools offers history researchers many advantages. The digital age is widely praised for transforming access to an impressive abundance of archival sources on an unprecedented scale. This easy access is quite valuable to historical research which draws much of its prestige and originality from an extensive reliance on primary sources. Traditionally, researchers embark on exhausting and time consuming archival trips to dig into the past. They search catalogues, sift through numerous collections, lift heavy manuscripts, and ask for the advice and guidance of curators in order to gather primary sources. The digital age has changed this process of collecting archival material. Owing to the increasing application of digital tools to history, researchers access a wealth of

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[1] Rosenzweig, "Scarcity or Abundance", 3.

primary sources that have been traditionally enclosed in distant archives. A considerable number of museums and archives are digitizing their collections at a rapid pace. New sites of digitized archives burgeon every day. Manuscripts, letters, photographs, periodicals, books, artifacts, diaries, travel accounts, and newspapers have been published online. Unsurprisingly, historians access well-mined primary sources from their desktop and save the time and money of tiring archival trips.

This wealth of sources is made accessible owing to a growing number of digitization projects. The Library of Congress's American Memory Project presents more than 8 million historical documents about four main eras of American history: The American Revolution and the New Nation (1775-1815), National Expansion and Reform (1815-1860), Civilization and Reconstruction (1860-1877) and the Gilded Age and Progressive Era (1878-1920). The digitized material include seminal documents such as the eighteenth and nineteenth amendments to the United States Constitution, the Bill of Rights (1791), the Declaration of Independence, several acts, treaties, photographs and other documents.[2] The Project (AMP) aims to enhance researchers, students, teachers, and public access to American memory.

In 2004, Google started to digitize books belonging to five major libraries as part of Google Books Library Project. The libraries, the so called Google 5, are the New York Public Library, the libraries of Harvard, Michigan, Oxford, and Stanford Universities. These libraries agreed to let Google digitize volumes from their printed book and serial collections in exchange for getting copies of the digitized material.[3] In 2015, Google devoted around $ 200 million to scan and index 15 million books.[4] The digitized sources are so massive that there are increasing references to the Googlization of libraries.[5] A similar open-access project was announced at the same period by Bewster Kahle, Internet Archive. The latter is one of the largest repositories of digitized nineteenth century sources in the world.[6]

The abundance of digitized newspapers is also a ubiquitous feature of the digital revolution. ProQuest's Historical Newspapers offers access to some of the best known American newspapers of the past 200 years.[7] They have more than 45 premier titles covering topics such as the U.S Civil War, immigration, Westward expansion, industrial developments, race relations…[8] Trove, the most successful online library, offers researchers access to around 400 million sources.[9] Newspapers are digitized under the Australian Newspaper Digitization Program with the aim of enhancing users' access to the greatest number of digitized items.[10] The digitized newspapers cover Australian history from 1803 through the mid 20th century

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[2] Drexler, "Primary Documents in American History", The Library of Congress.

[3] Jones, "Google Books as a General Research Collection," 77.

[4] Maidenberg,, " The Race to Create a Digital Library,"2008.

[5] Miller, *Googlization of Libraries*, 109.

[6] Brewster,"The Internet Archive,"2.

[7] Mussel, Review of ProQuest Histororical Newspapers, 2011

[8] ProQuest Historical Newspapers .http://www.proquest.com/products-services/pq-hist-news.html

[9] Shoemaker, "Making History Online,"4.

[10] Digitized Newspapers and gazettes. *Trove Help Centre*. http://help.nla.gov.au/trove/using-trove/digitised-newspapers

and after. European Newspapers have made historical newspapers from 23 European libraries freely available online. The project was funded by the European Commission (EC) under the Competitiveness and Innovation Framework Programme. Cambridge Archive Editions, in partnership with East View Information Services, publishes research collections pertaining to the Near and Middle East, Slavic and Balkan regions and East and South East Asia covering various topics such as Arab nationalism, border mapping, constitutional affairs, minority rights, and maritime issues. [11] This growing digitization of primary sources means that archives are "being transferred to a digital brain".[12]

 The digitization of primary sources has also contributed to a notable rise in the number of researchers visiting libraries websites to access digital collections. In 2015, the Library of Congress welcomed around 1.6 million onsite visitors and more than 482.5 million page views on the Library's web properties.[13]This remarkable increase in the use of libraries' websites leads to a growing circulation of sources that have been traditionally in analog format. An interesting case in point is the Library of Congress collection of early Edison motion pictures. Prior to the advent of the digital media and technologies, history researchers were compelled to make expensive trips to Washington, D.C to consult these pictures. The digital age has allowed students from Bangor, Maire, to Baja California to have instantaneous access to such source.[14]

Digitization has also allowed access to fragile sources which are commonly withdrawn from public access. An interesting example is Women's Suffrage Banner Collection which consists of early 20th century suffrage banners made by the Artist's Suffrage League[15]. A great number of the banners are embroidered with cotton velvet and blown silk often with appliqué lettering which is under the threat of disappearance.[16] The fragility of the banners led the imposition of restricted access to this unique collection. Digitization has made the material accessible again for scholarly use. It has therefore facilitated researchers' access to fragile sources and preserved them from the possible damage of repeated physical handling.[17]

Besides, an impressive number of dissertations, masters and honors theses from many universities are now available in open access repositories. Ethos, UK-Theses Online Service, provides the full text of over 100,000 PhD theses for immediate download from all UK PhD awarding institutions. Some academic journals such as Sage Open have peer-reviewed articles on social and behavioral sciences and the humanities freely available on the internet through

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[11] Langan, "The Use of Primary Source Material,"60.
[12] Jeurgens, "The Scent of the Digital Archive", 10.
[13] Fisher, Andrey, The Library of Congress by the Numbers in 2015, 2016.
[14] Cohen, *Digital History*, 84.
[15] The Artist's Suffrage League was founded in 1907 by Sylvia Pankhurst. The League's members were mainly women artists who sought to campaign for British women's suffrage rights through posters, banners, and designed post cards.
[16] Screibmain, *A Companion to Digital Humanities,* 492.
[17] ibid.

open access. The latter rests "on the ethos that as a form of public good, knowledge is far more beneficial to all when it is shared and built upon".[18]

Online tools such as emails and blogs have facilitated communication and collaboration among researchers. Students, amateur or independent scholars can express themselves, interact with and exchange ideas with professional historians.[19] Laptops have also made historical research easier. The taking of notes in reading rooms using portable computers has become commonplace. Hence, researchers save time and take more organized and clear notes. Besides, digital cameras have become popular in reading rooms due to their declining costs and increasing ease of use. Researchers with limited time can cover more collection materials during their visit by photographing relevant materials for in-depth study later on. This means that they create their own personal archives. They no longer need to wait to get poor and expensive copies. In addition, digital cameras are reducing the damage which may be incurred by scanning. Physical handling, exposure to the light and heat generated by scanners may badly affect original documents mainly those which are already aged and deteriorating.[20] On this basis, digital cameras facilitate researchers' collection of material and are gentler on sources.

There is no doubt that history researchers have been increasingly reliant on digital tools and methods. They are reaping the benefits of an amazing number of digitized archival records which have been traditionally held in distant archives. They access now a wealth of primary sources from their desktops and save the time and money of tiring archival trips. There is also an increasing amount of secondary sources such as eBooks, theses, and journals available freely on the Internet. The growing digitization of sources has also allowed access to fragile material which has been inaccessible. This abundance of sources has led to a growth in the number of researchers visiting libraries' websites. History researchers from all over the world can now communicate and collaborate with each other regardless of distance. All of these advantages of the digital age have opened new potentials for historical research.

2. The Digital Revolution and Historical Research: Challenges
This rosy aspect of the digital revolution and its beneficial impact on historical research needs however to be balanced. Working with digital sources raises increasing concerns about the loss of context. The latter not only affects researchers' understanding of the past but also their ability to determine the significance of the material they have access to.[21] Analogue archival material provides researchers with access to the context surrounding the collection. On the contrary, researchers relying on digital resources are constantly struggling with a serious lack of contextual information as digitized primary sources are often isolated from their original collections. This loss of context is highly problematic for historians' interpretation of the past and leads to "a vast void of knowledge filled by myth and speculation."[22]

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[18] Chan, "Open Access: Promises and Challenges of Scholarship in the Digital Age,"2009.
[19] Weller, *History in the Digital Age*, 12.
[20] See Cox, "Machines in the Archives,"2007.
[21] Lee, "A framework for Contextual Information in Digital Collections,"100.
[22] Conway, "Preservation in the Digital World, 1996.

It is also interesting to note that although modern technologies have facilitated researchers' use of primary sources, inequalities of access are still persistent. Researchers with limited funding cannot access some digitized sources which are only available through costly subscriptions. The British Newspaper Archives, which offers over 20 million searchable pages from more than 700 newspaper titles from the UK and Ireland, charges users £79.95 for a 12 month subscription. Unsurprisingly, researchers with limited funding cannot access these sources. Therefore, "the social divide seems to be a problem of the digital humanities at large" as only affluent Western institutions mainly Anglo-American universities can afford the open and free access to researchers.[23]On this basis, there continues to be inequalities in terms of access to sources between the North and South.

The digitization of primary sources also relies on selection which is dependent on commercial, financial, and political factors. It is not therefore a neutral process. Each institution has its own reasons and priorities for digitization. Selectors consider questions such as the content value of the collection, demand from users, intellectual property rights, issues of religious, ethnic or community sensibility and other technical aspects such as the possibility of digitization and the potential damages that can be incurred from this process.[24] Certainly, only some sections of analogue archives are presented online. Researchers may miss non-digitized material that may be of great significance to their historical enquiries. Consequently, this runs against researchers' rosy expectorations that all material have been converted into a digital format.

While there is a consensus that digitization has facilitated researchers' access to well mined sources, there are increasing doubts about its viability for long-term preservation. Terry Kuny commented that "digital collections facilitate access, but do not facilitate preservation. Being digital means being ephemeral. Digital places greater emphasis on the here and now rather than the long-term."[25] Steward Brand warned as well of the possible loss of information which may be incurred by the growing reliance on digital tools for preservation. Digital obsolescence threatens the storage and protection of authentic sources. He lamented that we are now in the "Digital Dark Age" which is marked by "drastic and irretrievable information loss".[26] These considerable concerns about preserving digitized sources are intensely fed by the problem of digital obsolescence. Digital tools, storing devices, file formats, hardware and software versions are rapidly changing. Word processors such as Microsoft World cannot read files created with earlier versions of the same word processor.[27] Most importantly, digitization often leads to an enormous loss of information and poses a consequent risk of losing our collective memory.[28]Web addresses change and disappear quickly. Researchers are also striving to make their online works survive. They experience the common "404 Not Found" error also called Error 404. [29] Accordingly, the adoption of new methods to ensure the

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[23] Jeurgens, "The Scent of the Digital Archive". 3.
[24] Gertz," Selection for Preservation in the Digital Age,"79.
[25] Kuny, "A Digital Dark Ages,"10.
[26] Brand, "Escaping the Digital Dark Age,"46.
[27] Besser,155.
[28] Hristova. "Digitization is it a Viable Preservation Alternative," 23-25.
[29] Ibid.

preservation of digitized sources for long-term access came to be seen an urgent need. [30]We can identify three popular preservation strategies: emulation,[31] information migration, [32]and encapsulation.[33]The viability of these preservation techniques is still however debatable.[34]

Conducting historical research with digitized resources raises also considerable concerns about a possible loss of sources' authenticity. The latter is defined as the "quantity in a thing of being what it is claimed to be (valid, real, and genuine) verified in archives and special collections through an investigative process known as authentication".[35] In the absence of the original source, it is difficult to determine the trustworthiness and truthfulness of digitized sources. Wendy Duff pointed out that "as records migrate from a stable paper reality to an intangible electronic existence, their physical attributes, vital for establishing the authenticity and reliability of the evidence they contain are threatened."[36] Digital files are unstable and therefore can be easily altered and falsified. Such loss of authenticity can be caused by errors and losses during the process of digitization. External and internal attacks on items, such as those by hackers, malicious attacks, and financial problems can all have a negative effect on the authenticity of digitized materials.[37] Some digital reproductions are of poor quality. They can be blurry or marked and the researcher cannot determine if this is the outcome of a poor scanner or a truthful representation of the original material.[38] A good example is Google's digitized books. These are often laden with errors such as dark spots, food stains, and images of scanner operators' hands covering table of contents.[39] Moreover, some pages can be missed in scanning and metadata can be imputed incorrectly.[40] This explains archivists' reliance on expert researchers to come to terms with and correct processing errors.[41]This poor quality of some digitized sources can be deeply frustrating for history researchers.

It is also interesting to point out that the increasing reliance on digital tools is a direct challenge to the practice of digging around in archives through dust-covered files which is part of the historian's art. The long hours spent in the archives, the irresistible lure of original archival collections, the marvelous feeling and smelling of dust is part and parcel of the physical encounter with original documents which endows historical research with a unique charm. Helen McCarthy explained that:

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[30] Besser, "Digital Longevity,"156.

[31] Emulation relies on the creation of new software that can emulate or imitate older software and hardware in order to preserve their functionality.

[32] Information migration is the transfer of data from one file format to another, for example from Word to Pdf. See Shanker et al, "Strategies and Techniques for Preservation,"323.

[33] Encapsulation hinges on placing together digital objects and data along with everything else that is needed to access that object : See Jayant Deshpande . "Digital Preservation ,"27.

[35] Manžuch, "Ethical Issues In Digitization,"9.

[36]Duff, "EnsuringthePreservationofReliableEvidence,"29.

[37]Routhier , "Digitization and digital preservation," 6

[38] McCracken, Krista. " Archival Digitization", 2014.

[39]Ibid.

[40] Ibid.

[41] Ibid.

> The materiality of the primary source is part of the culture of historical research: rummaging through dust-covered files, turning the decomposing pages of thick-bound volumes, removing rusty paperclips, perusing bundles tied with ancient string it's all part of the voyage of discovery into the past which drew most of us to our careers as historians.[42]

The question of digital literacy looms large in current debates about the potentials and pitfalls of doing history in the digital age. Many history researchers are still not adept enough in advanced digital search techniques. Toni Weller remarked that concentration on technology and digital tools may be alienating to more traditional historians.[43] This is mainly due to the fact that Knowledge of digital tools for historical analysis has not become very widespread. This implies that the use of digital tools is still basic: Google searches and the use of digitized primary and secondary sources.[44] Some institutions have been aware of the pressing need to promote researchers' digital literacy. For instance, The Institution of Historical Research (IHR) offers free online access for researchers to improve their use of complex digital tools. Topics covered include visualization, linked data and cloud computing and the more extensive training for semantic markup and text mining. The main aim of the courses is to enable historians to better analyze and present their research in novel ways.

This paper explored the opportunities and challenges which the digital age has brought to historical research. It revealed that history researchers are reaping the benefits of an unprecedented access to a wealth of digitized sources. This large amount of freely available sources is commonly praised as the most important advantage of conducting historical research in the digital age. The ease of access to sources has made historical research more appealing to an increasing number of researchers. However, this ubiquitous reliance on digitized material is problematic. The loss of sources' original context, inequalities of access, the subjective nature of the selection process, the authenticity, longevity, and poor quality of digitized material continue to be a serious cause for concern. Some history researchers still prefer working with dust-covered files and have limited knowledge of digital tools. More attention needs to be paid to these obvious limitations in order to enhance the new possibilities of the digital turn.

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[42] McCarthy, Helen. "Political History in the Digital Age,"1.
[43] Weller, *History in the Digital Age,i*.
[44] Gibbs, Fred, and Trevor Owens, "Building Better Digital Humanities Tools,"1-14

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