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# PRESERVING FOR PEOPLE:

## OBSERVING HUMANITIES SCHOLARS' RESEARCH PRACTICES IN A HYBRID ARCHIVE ENVIRONMENT

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*Abstract* – In order to assess the potential suitability of digital preservation efforts for future research, it is necessary to understand how users interact with information in the present. Yet there is very little information on how humanities researchers – a key u ser group for archives – interact with archives beyond discovery. In the following, we show the importance of recognising end -users as part of wider information workflows that comprise not only discovery but the reuse of information and an unfolding interp retation of materials to construct new knowledge. We make our case through the presentation of findings from a naturalistic empirical observation of 11 humanities researchers engaging in research at a national archive. Our work identifies two research prac tices important to knowledge construction – reading and collecting – through which scholars create an interpretation of the archival record situated in its wider context.

*Keywords* – archives; Human Information Interaction; knowledge construction; information use

*Conference topics* - Design, cultivate, enhance, and ensure collaboration in line with changing digital workflows and changing roles and responsibilities for digital info; Design, stimulate, enhance, and ensure collaboration with changing definitions of knowledge heritage institutions.

## I. INTRODUCTION

Meaning changes over time, and is by its very nature impossible to preserve. It is highly dependent on the individual carrying out the interpretation, among other factors; as such, cultural artefacts such as archival records have been recognised as always in a state of becoming [26]. This has led to a division between the user and the archive when it comes to perceived responsibilities for contextualising records. While traditionally, archives have focused on preserving contextual information in the form of provenance, i.e. the context of creation, further interpretive activities have largely been considered under the role of the user [23, 27]. However, increasingly in the broader 'GLAM' sector – galleries, li braries, archives, and museums – there has been a move towards providing better contextualisation of

collections data [e.g. 7, 8, 20]. In the context of an increasingly connected and enriched digital ecosystem, we should reconsider the distinct roles and responsibilities of users and archives for further contextualisation of digital records.

It has been noted that there have been comparatively few user studies conducted in archives and of these, most focus on information-seeking behaviours [31, 37]. This appears a peculiar omission given that such use is one of the primary purposes for preserving archival records [37], though perhaps not completely surprising given the separation between the archive and the user's perceived responsibilities. To challenge these current assumptions about the distinct roles of end-users and the archive, it is essential to understand how these users interact with archival materials.

We report a naturalistic observation of 11 humanities researchers working with archival records within a large, national archives. Two core research practices are identified and explored in-depth: reading and collecting. These complex practices, comprised of multiple information activities, are understood to be fundamental to supporting end-users' successful interpretation of cultural heritage information, with findings providing evidence of the highly relational nature of archival information. The findings suggest that the distinction between the roles of the archive and the user when it comes to the interpretation of archival information should be reconsidered and that in providing additional contextualisation for archival records, through maintaining greater links between records, the interpretive power of the digital archival ecosystem would be enriched.

## II. RELATED LITERATURE

Extant literature on research practices in the archive is limited, with most studies taking a behavioural approach focused on information-seeking activities [31, 37]. Likewise, though the research practices of humanities scholars' have been examined, this body of literature is heavily weighted towards discovery [e.g. 2, 32].

### A. Searching

Research practices relating to information-seeking in the archive reflect broader general trends in the literature on humanities scholars, namely that chaining and browsing are common approaches to finding information [5, 11, 35, 40]. In digital information environments, this preference for browsing may also be indicative of concerns over appraisal and digital selectivity in online collections [9, 34]. Proper names, dates, and places are all commonly employed in queries for information [12, 16], reflecting the important role of contextual information in archival research [13]. In other studies, contextual knowledge has also been used to refer to the expectation of historical researchers "doing their homework" before entering the archive [23]. The same expectation has also been noted of other humanities researchers, such as genealogists [14, 42]. Duff et al.'s [15] study of 'meaning-making' in the archive also found that a predetermined framing for their research was essential for students seeking to navigate the archive, reflecting a similar need. Conversely, Duff et al. [15] also found that the finding aid provided an opportunity for students to build their contextual knowledge of the topic and construct a holistic view of the collection as a whole, suggesting that such a framework for discovery can also be provided by the archive itself.

### B. Reading & Writing

Despite their centrality to the humanities research process, practices such as reading and writing that reflect interpretation and use of primary sources have received much less attention in the literature. Of these, reading has received a greater focus, with writing often appended to studies of reading: as such, these practices are discussed together here. Palmer & Neumann [29] identified three types of reading particular to humanities research: scanning, rereading, and reading for writing. While scanning arguably relates largely to the identification of relevant material, re-reading and reading for writing are at least partly interpretive processes [29]. Palmer & Neumann [29] also note the integrated nature of writing during reading, with activities such as note-

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taking and annotation often taking place alongside reading.

As with many disciplines, humanities research has begun to incorporate digital technologies, though largely where they support existing practices [6]. Some scholars have pointed to the effect of digital technologies on reading practices, with an increase in the use of e-texts [17, 36, 38, 40], though it is less clear whether these findings apply to primary research materials. Gooding's research, analysing webometric logs from the Welsh Newspapers Online collection [18] highlights that user behaviours in digital libraries and related systems are more representative of search practices in both physical and digital environments than a change in reading behaviour. Sinn and Soares [34] suggest that the true impact of digital technologies on reading practices may also be disguised by scholars' habit of referencing original sources even where the material has been accessed online.

## C.  Collecting

More recently, as digital technologies have increasingly impacted upon humanities research, some studies have identified personal information management as another important research practice [1, 17, 22, 41]. This shift can be attributed partly to the ability of scholars to self-digitise large volumes of material using digital cameras, smartphones, and tablets [10, 17, 28, 33, 41], though the influence of decreasing costs of storage and relaxing of restrictions on cameras in the reading room should also be recognised [10]. This has given rise to the increasing importance of understanding personal information management practices, incorporating activities such as collecting and organising, due to their increasing importance in humanities research [1, 17, 41].

Gathering and organising research materials have been recognised as significant information activities under the broader research practice of 'collecting' [30]. With particular reference to the archive, Antonijević and Cahoy [1] note the intertwining of these two activities, as organisation of materials often begins concurrently with gathering source materials from the repository.

Trace and Karadkar go so far as to associate these activities with a new 'ex situ' mode of archival research, whereby the user seeks to collect materials in large quantities before working with them elsewhere [41]. This distinction may also be reflected in the findings of Kamposiori et al. [22] who consider the iterative nature of searching and gathering across two distinct phases. This reflects similar findings noting the shift in humanities research practices in general away from the institutional repository [6, 33].

## III.  METHOD

To identify research practices – beyond discovery – significant to archival research, along with how and why they were carried out, in-person observations inspired by a Contextual Inquiry approach [19] were conducted with 11 humanities researchers at the main public site of a national archive over a period of 6 weeks, in October – December 2019. In this section, we discuss participant recruitment approach, including key ethical considerations, and rationale informing data collection and analysis. The study received ethical approval from our departmental Research Ethics Committee.

## A.  Participant Recruitment

Participants were approached on the basis that they were currently conducting in-person research with the archives' collections. Recruitment took place both in advance (through the archive's research newsletter) or in-person, at the archive itself. All participants except one were recruited ad hoc on the day, this being the most successful recruitment approach. Participants were asked whether they were conducting research that day and if they would consent to being observed. If so, participants were asked to explain the topic of their research, to ensure a breadth of humanities research was covered. The topic of the advance recruit was also noted. The study was naturalistic in the sense that none of the activities nor topics were prescribed: they consisted of research that participants had already planned to do during their visit. Participants were also approached on the basis of whether they would be working with physical or digital archives (or both) that day, to

ensure findings were not restricted to a particular materiality of the record.

During the study, 6 of 11 participants worked exclusively with physical records and 5 exclusively with digital records, though this comprised digitised rather than born-digital materials. This reflects a potential bias in participant selection: participants were mostly recruited on site, but users of born-digital materials may have less reason to visit the archive. Participants represented a mix of newer and more seasoned researchers. Rather than determining sample size in advance, the principle of 'information power'[25] was adhered to, whereby sampling continues until a (subjectively) rich insight is gained to address the research aims. Though participants were recruited from a single archive, the nature of the information activities identified does not appear to be archive-specific. However, as participants exclusively engaged with textual materials, we only make limited claims of generalisability to archives with predominantly non-textual (i.e. image, video or audio) materials.

### B. Data Collection

Contextual Inquiry [19] was chosen to inform our data collection approach, as interpretive behaviour is inherently difficult to observe and would thus require probing, through dialogue with the participant, to understand. We felt that an approach that allowed for greater researcher intervention, rather than passive observation, would provide greater insight into the participants' research practices and motivations behind them [3]. Though this posed a potential disruption to a naturalistic observation, this risk was mitigated by ensuring interventions were limited to where we believed this would provide greater insight and would not influence the participant's actions [24].

Prior to beginning the observation, participants were informed that the total session, including the observation and any follow-up questions, would last around one hour (mean = 52 min., 7 secs.; s.d.= 8 min., 2 secs.) and that they would be notified as the end of the session approached. At the beginning of the observation, participants were asked to briefly describe their task and to provide

a background context for their research. As the archive advised users to order material prior to visiting the archive, all participants had a predefined task in mind. During the observation, participants carried out their chosen research task. These included but were not limited to: consulting online databases only accessible within the physical archive; creating conceptual links between existing research materials and new information found; and making personal copies of documents. Participants were informed that the study was interested in understanding their routine research activities and as such they should carry out their research as they normally would. Directly following the observation, the researcher asked follow-up questions to expand on or clarify participant actions and test researcher assumptions. No fixed questions were asked, allowing the researcher to follow-up on important comments made or actions carried out by participants.

Data was audio-recorded, de-identified by assigning participant numbers, and transcribed in full. Identifying features from transcripts were also removed, such as references to personal names where participants were conducting genealogical research. Since data collection was carried out in public areas of the archive, video data was not collected, in order to protect the privacy of non-participants.

### C. Data Analysis

Otter.ai – a GDPR-compliant, automated transcription tool – was used to aid transcription. We did not grant permission for Otter.ai to use the transcripts for machine learning purposes. The transcripts were not stored on Otter.ai's servers but removed once transcription had occurred and stored on the researcher's encrypted and password-protected computer. Analysis was partially inspired by Thematic Analysis (TA) [4]: an initial total coding of activities was carried out inductively, through which codes relating to information activities were identified. Codes were compared for similarity and some merged or split accordingly. Following comparison with existing discussions of information activities under the broader aggregation of research practices [e.g. 30], codes relating to research activities were grouped

under several research practices. Qualitative Data Analysis (QDA) software NVivo was used to support the analysis. Excerpts related to both information activities and practices were extracted from NVivo and used to construct a narrative explaining what these research practices involved, how and why they were carried out by participants and how they facilitated knowledge construction as an outcome.

## IV. FINDINGS

The findings identified and elucidated two core research practices that have as yet been understudied within the literature on humanities scholars' research practices, particularly with reference to the archive: reading and collecting. The use of familiar terminology to describe these practices was chosen to reflect participants' own understanding of their actions, though these are expanded beyond a surface-level usage in the discussion of the findings below. The findings reveal a tension between selectivity and comprehensiveness in users' knowledge construction processes. While users desired to interpret records in their archival context – referring to both the broader content of records beyond the immediate information they were interested in, as well as the context in which records were produced (i.e. their provenance) – they also needed to treat information selectively, in order to create new knowledge that addressed their research interests. This tension was further complicated by the changing research practices of some participants that reflected broader trends towards gathering large amounts of materials to process off site [6, 33, 41].

### A. Reading

Reading has been identified in archival theory as a key way in which archival users assign meaning to records [23]. It has also been discussed through empirical studies of humanities' researchers [e.g. 5, 29, 30] though it has not yet been explored in an archival context. Participants often described themselves as simply 'reading' when undertaking a broad range of activities, from identifying relevant information through scanning to activities requiring more interpretative effort.

All participants arrived at the archive with some level of existing knowledge on their topic, a framing which varied widely in formality from detailed research guides that determined "exactly what to be looking out for" (P05) to "a few different subject areas" (P06) to be explored. Initial engagement with the record was shaped by this pre-existing framing and can thus be seen to align with Palmer and Neumann's [29] definition of scanning as identifying details that intersect with their line of inquiry. Nonetheless, engagement with the record through scanning also helped to inform the participants' interpretation and thus went beyond merely identifying records of relevance and helped to build the participants "contextual knowledge" [13]. For example, P04 was at the archive to scope information on the topic of WWII spies. Attempting to confirm their "growing hypothesis that a lot of these people who were bilingual acted as spies, as well" they scanned the record for details that might confirm this. These "clues" were often single words or phrases that "jumped out" (P08) at the reader, such as an individual's "very special work" or seemingly significant references, e.g. to the R.S.H.A (P04). Often, participants interpreted these phrases in the context of the wider record and did not know the specific meaning of the word. P04 admitted that they did not know what R.S.H.A. was, but picked up on the phrase in relation to the wider context: "She says she thinks it would be impossible for her to resist telling the Russians all she knows about her work for the R-S-H-A, I need to figure out what R-S-H-A is, I don't know?" Another participant, P05, made a list of unfamiliar keywords from one record to help them interpret another document: this list served "just to have it, top of mind, the words that I should be looking for that might not spring to mind." As such, this style of reading can be seen to go beyond a simple identification of predetermined cues to demonstrate how the meaning of the record is determined through interaction between the user's own interests and the content of the record, within a particular semantic context. Even during a relatively lightweight interaction such as scanning, the user is still developing an evolving knowledge of their topic and the record that shapes how they interpret this information. It is noteworthy that this

process is highly selective, in that the user does not pick up on everything from the record. P11 commented that, "It's basically you know, maybe someone might read it and not really see it and someone else might kind of notice it" suggesting that personal interests and experience are influential in shaping the user's interpretation.

On occasion, scanning through the file as a whole – or "reading it through" (P08) – enabled participants to construct the broader context of the record or file, leading to an interpretation more than the sum of its parts. Seeking to complete a biography of a surgeon caught up in partisan fighting, P08 had hoped that these chosen files would provide them with evidence of why this individual had not received a posthumous award for bravery. Although there was no record of their research subject in the file, in reading the file as a whole P08 was able to find multiple examples of comparable individuals. Collectively, the records provided P08 with "a clearer idea of the decision-making process" and thus allowed them to construct a relevant, though slightly different argument than the one envisaged. The act of scanning through the document gave P08 the opportunity to interpret the connections between the records in the file and thus allowed them to arrive at a very different understanding of the significance of the records than their original framing had suggested.

Though the archival arrangement aided interpretation for some participants, others found that it "messes up the ideas in my head" (P05) or that they "might've organised it differently because of my interests" (P11). Whereas in many instances participants were constrained by the limitations of physical documents – being unable to rearrange the document order or only bringing a maximum of three files to the reading room table at any one time – participants utilising a digital environment were not subject to these constraints. As such, participants created their own context within which to read the records. In the simplest manner, this could be seen in participants working with databases of digitised documents, such as P01. The capabilities for keyword searching in genealogical databases meant that they could effectively reorganise the collection according to their own interests, creating a temporary finding aid for all documents on a particular individual in the form of the search results list.

P03 demonstrated a more complex example of this, which we can contrast with P08's "reading through" the file in a manner that could be described as 'reading across' the archive. P03 was working with a digitised collection of newspaper clippings, collecting information on a particular London borough to write a history of the area. Though P03 had chosen to work from this particular archive as a matter of convenience, the collection they were working with was stored and maintained by a different institution. Being able to access multiple archival collections from a single location, P03 could compare information from different sources, as they did on discovering a death notice for an individual they were researching. This discovery prompted P03 to "go into the reading rooms... window and try and see if, whether his [...] will, exists here." Opening multiple tabs enabled P03 to compare information with ease, ensuring that: "I don't have to keep going backwards and forwards, and so that I can open more than one to make comparison if I want to." While this breaks with the archival context by disrupting the arrangement of two closed sets of documents, it creates a new context more pertinent to P03's interests and allows them to create a new interpretation of the record.

### B. Collecting

Several studies have identified a shift in research practices, with humanities researchers now gathering large amounts of data to analyse in greater depth beyond the institutional repository [6, 33, 41]. Trace and Karadkar [41] have proposed two distinct models of archival research, defined as "in situ" and "ex situ" research. While "in situ" research resembles traditional archival research, largely reliant on reading materials in the reading room and selectively taking notes rather than copying materials, "ex situ" research reflects the observed trend towards gathering materials in large volumes and interpreting them elsewhere [41]. The findings here reflect Trace and Karadkar's definitions of in situ and ex situ research, with most

participants exhibiting a preference for one over the other. Nevertheless, the findings here also suggest that despite this alignment, these two models are motivated by the same underlying concerns and thus may be more similar than has previously been suggested.

The majority of participants used digital photography to capture records, and clearly exhibited an ex situ model of research. Some participants also used note-taking, though this was usually supplementary to capturing: very few participants exclusively took notes. As such, though some participants can be seen as working exclusively "ex situ", others presented an integration of these two approaches rather than working solely "in situ". While we can characterise participants' approaches to collecting broadly along these lines, it should be noted that these varied widely among participants and can be seen to be shaped by not only their chosen style of working, but also participants' own personal opinion on what might be necessary to preserve the meaning of the record for later usage.

Most participants perceived the context of the record as important to capture, in order to facilitate later interpretation beyond the archive. 'Context' was used by participants to refer both to the wider informational content of the record beyond the specific information they were interested in, as well as the broader setting within a particular file or series, which we might relate to the record's provenance. On several occasions, participants implied that a single record could provide "the context it's found within" (P11) to a single piece of information. However, this context also scaled rapidly: P07 used letters as an example where the content stretches across multiple documents, and multiple items might need to be captured "to know what you're looking at" when returning to the record. Participants' awareness of context also extended to preserving the archival arrangement within a wider file or even series, thus preserving a particular provenance for a group of records. This process extended into early organisation of materials, reflecting Antonijević and Cahoy's observation that organisation often begins during gathering of materials [1]. The

simplest way in which participants did this was through photography: P06, who focused on gathering materials without interpretation beyond a simple relevance check, was careful to request their documents in ascending order of series and file. This ensured that the photographs on their camera roll would be in the same order as accessed in the archive, once P06 got home and began processing them. Other participants had much more complex methods of preserving the context through a combination of note-taking and capture. P05 used both a spreadsheet for taking notes alongside cloud storage for images. While the photographs provided an opportunity to capture the most important material and "access it all, offsite. Through our little photographs", the spreadsheet provided an overview of the collection, arranged into files and series, that allowed P05 to "read as much as possible, in one go. Rather than having to go back to [the image] all the time."

Collecting archival materials could also provide participants with an opportunity to reshape the archive according to their own interests. Most participants indicated that they would do this once they had left the archive, at a later stage in their research, though occasionally this took place during the archival visit. Working with a series of minutes relating to the governance of Malaysia during colonial rule, P07 was seeking information relating to land tenure. As one of many topics discussed in the minutes of the governing body, not all the information would have been relevant and required a significant amount of time to look through. Although a series of thematic indexes also accompanied the minutes, the rules of the archival reading room stated that only one bound volume could be consulted at a time, meaning that P07 could not use the minutes and indexes together. Creating a workaround for this, P07 captured relevant sections of the indexes on a tablet, effectively creating their own finding aid for the documents. P07 was then able to cross-reference this to the minutes, compiling a narrower collection of documents relevant to their own research interests. Therefore, collecting can be seen not only as gathering material, but also as the first stages of interpretative activity through

the organisation of newly gathered research materials.

Participants capturing large volumes of materials more strongly reflected the "ex situ" approach described by Trace and Karadkar [41]. Notably, both P06 and P09 were on extended visits to the archive and did not see themselves returning once they had captured the relevant material. P06 described themselves as taking "anything that looks remotely like it's relevant"; P09 confirmed they were not very sure of an item's relevance before photographing it and that "since I just come here twice a year, I don't have the luxury of checking it again." Conversely, participants who were able to revisit the archive might be more likely to take an interpretive approach to collecting. For example, P03 – who exclusively took notes in a word processor on their laptop – only copied "direct quotes [...] when it's very relevant". Otherwise, they would gloss over less relevant sections, before "picking it up when it starts being interesting again".

Notably, participants working with materials beyond the archive suggested that they would carry out a secondary process of gathering materials from their own personalised archive at a later stage. P06 described themselves repeating their earlier process, "it'll be again, start from the top and work my way down and then I'll take notes." After this, P06 intended to discard any unused materials and keep the most relevant for reference, because "if you keep the picture, then you can always refer back to it." Whereas P06 describes a process of filtering materials again to get to the most relevant, other participants suggested that reorganising materials would help them with later interpretation: both P11 and P07 described a subsequent process of arranging materials according to themes. These participants also referred to writing at this stage, suggesting that such practices may reflect Palmer and Neumann's definitions of rereading and reading for writing [29]; as this was not directly observed in the archive, the role of collecting in supporting these activities merits further investigation.

V.    DISCUSSION

These findings suggest that users are instrumental in creating a context for records that goes above and beyond what is traditionally provided by the archive. While such interpretive activities have traditionally been seen as the role of the user [e.g. 27], we propose that a reconsideration of the division of responsibilities between user and archive is required to enrich the digital ecosystem and preserve information in a way that supports users' knowledge construction activities.

Participants' research practices reflected a desire to work with the totality of the record, including the broader context: this was largely interpreted as incorporating the record within the wider file or series. For example, though all participants engaged in scanning – identifying details that intersected with their own research interests [29] – during interaction with archival records, this process also enabled them to consider information in relation to the wider context of the file, sometimes leading to an interpretation more reliant on the file as a whole than on the individual record. This enabled researchers to expand their own interpretation of the record with direct reference to the broader context it was found within. On occasion, this went even further, with researchers identifying details that they had not come across before which informed participants' own evolving knowledge base. This suggests that digital preservation efforts need to consider whether further work is necessary to contextualise archival records by making these connections explicit. Approaches to provide additional contextualisation for artefacts in museums [7] and libraries [8] suggest that this is increasingly popular among knowledge heritage institutions: as the digital ecosystem becomes more interconnected, it is likely that users will come to expect these types of connections to be preserved.

The desire of participants to work with the totality of the record was most clearly seen among those who needed to work with the record elsewhere. Researchers who did not envisage a return to the archive were more likely to take large numbers of images. Although this is indicative of a

fear of missing something, we believe this also reflects the reliance of researchers on the context and structure to interpret a perceived 'archival' meaning of the record. These research practices are suggestive of the need by researchers to create a fixed point for themselves – in the form of a static collection of archival images – from which they can refer back to and recreate an 'archival' meaning of the record. Participants primarily working "in situ", who were able to easily return to the archive, did not appear as reliant on recreating this archive through captured images, possibly as they were confident that they could easily access the archive itself should they need to. As such, we suggest that digital preservation efforts will also require making available to the user the totality of the record. On one level this refers to the record itself, ensuring more than just a presentational view of files and limited metadata is available to the user. However, as seen in the findings here, participants often saw the meaning of the record defined relationally among other documents within the same file. This will necessitate providing access to digital records at scale, to facilitate knowledge construction by enabling this type of connection-building that can enable an interpretation that is more than the sum of its parts.

Nevertheless, it seems likely that users' personal collections of research materials perform an additional role in supporting knowledge construction, as the selectivity demonstrated in their research practices creates a narrower context for interpreting archival materials. It has been suggested that researchers may return to their existing materials to further select materials of relevance [22] or assembling materials to support writing [29]. While this requires further study as we did not observe what participants did when they left the archive, our participants did suggest they would undertake such activities at a later stage in their research. As such, the digital preservation community should also consider what types of tools and environments will be required to empower users to do this work. Tools such as Tropy [39], that enable the user to collect, organise, and arrange digitised records support some of this functionality. Nevertheless, more could be done to further integrate such activity within the routine workflows of archives to ensure that digital records are preserved in a way that facilitates these later stages of knowledge construction.

These findings complicate the picture that has emerged from previous studies, namely that archival research is increasingly moving away from the physical location of the archive building [6, 33, 41]. What this study reveals is that the user's initial attempts to construct meaning from the archival record is intimately tied to the wider archival context – as perceived by connections created between materials within a file or series – whether users are working "in situ" or "ex situ". An enriched digital ecosystem would rebalance responsibilities for this contextualisation of records, with the archive providing a greater level of linkage between documents, while supporting the user's research practices by facilitating greater access to the complete record and providing additional tools that support these activities.

VI.    CONCLUSION

The meanings of archival records change over time and depending on who reads them, and as such creating meaning from records has often been left to the user rather than as part of the archival workflow. While this makes it impossible and undesirable to preserve a fixed meaning of the record, we can and should support users' knowledge construction processes. There has so far been a lack of detailed investigations into humanities researchers' research practices beyond discovery. This study examines such practices, taking a particular focus on knowledge construction and what, in practice, these end-users do with archival information once it is found. The findings have revealed the particular importance of contextualisation that extends beyond what the archive would traditionally provide to the user. To facilitate an enriched digital ecosystem, digital preservation efforts should rethink what connections are provided between records and what is necessary for users to successfully interpret the record with reference to the archival context.

At present, users seeking to access the archive at a distance are at a distinct disadvantage, as they

do not have access to the full 'archival context' necessary to interpret the record with confidence. As such, they end up creating vast amounts of digital records for their own collections to preserve connections between records for future research. To support these users, the future digital archival ecosystem needs to ensure it provides access not only to the content of records, but also recreates the context to a degree that users are confident that they can accurately create the meaning of the record (i.e. the record within its archival context). This is a promising avenue for future design and research efforts aimed at ensuring that digital archives preserve materials in ways that best support their users in engaging with and making meaning from those materials. In doing so, digital preservation can facilitate repeated knowledge creation for generations to come.

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