Archival Liveness: Designing with Collections Before and During Cataloguing and Digitization

Tom Schofield <tom_dot_schofield_at_ncl_dot_ac_dot_uk>, Culture Lab, Newcastle University
David Kirk <david_dot_kirk_at_ncl_dot_ac_dot_uk>, Digital Interactions Group, Newcastle University
Telmo Amaral <telmo_dot_amaral_at_ncl_dot_ac_dot_uk>, Digital Interactions Group, Newcastle University
Marian Dörk <doerk_at_fh-potsdam_dot_de>, Potsdam University of Applied Sciences, Institute for Urban Futures
Mitchell Whitelaw <Mitchell_dot_Whitelaw_at_canberra_dot_edu_dot_au>, Faculty of Arts and Design, University of Canberra
Guy Schofield <guy_dot_schofield_at_ncl_dot_ac_dot_uk>, Digital Interactions Group, Newcastle University
Thomas Ploetz <thomas_dot_Ploetz_at_ncl_dot_ac_dot_uk>, Digital Interactions Group, Newcastle University

Abstract

We present "archival liveness" as a concept in design and the Digital Humanities and describe its development within a Research Through Design process. Working with a newly acquired archive of contemporary poetry we produced designs that both manifested and "geared in to" [Durrant 2011] [Gurwitsch 1979] the temporal rhythms of the work and infrastructure of archiving. Drawing on user-centred work with participants, often poets themselves, we focused on marginalia as a material feature of the archive, developing a drawing machine and live Twitter bot. Our work addresses institutional concerns for outreach and engagement while also acknowledging and exploiting the inevitably incomplete or live character of archival collections. For designers working with digital archives, we demonstrate the pragmatic and critical value of liveness as a focus of the design process.

INTRODUCTION

Digital interfaces to archives and cultural collections have, in recent years, become a crucial means of accessing our heritage and their design has become a subject of interest in interaction design [Dork 2014] [Dork 2011] [Feinberg, Carter, and Bullard 2014] [Feinberg 2012]. With a wealth of digital material being made available by institutions many have produced rich and innovative interfaces of their own e.g. (Smithsonian Design Museum n.d.) or in collaboration with researchers [Whitelaw 2013]. A number of methodologies have been applied to such design processes including engaging potential users of the interface in its design [Povinelli 2011] [Huvila 2008], or developing interfaces as critical lenses on cultural collections [Dork 2014] [Feinberg 2012] [Feinberg, Carter, and Bullard 2014]. Despite the popular image of archives as static and authoritative, digital archives and cultural collections are dynamic. Cataloguing, description and digitization are slow and costly processes; as such archives exist in various forms of incompleteness yet institutions are under pressure to share digital collections in order to better engage with a contemporary audience [Mansfield 2014]. There is consequently conflict between the state of completeness of the archive and the need for institutions to share what they have.

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In answer, we present a novel approach to the design of archive and collection interfaces and introduce the concept of *archival liveness* as a concept which opens "the play of possibilities for design" [Anderson 1994] and affords designers new formal and conceptual considerations in working with archival materials before and during cataloguing. Archival liveness promotes a view of the archive as a set of on going professional, institutional and technical processes and precipitates a focus on the different kinds of temporality embodied within these. Throughout our design work we made a feature of some of the distinctive temporal features of the archiving process and used them to reflect on the way that the archive is used and presented.

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We describe a Research Through Design approach [Frayling 1994] [Gaver 2012] in which we designed a range of experimental interfaces, visualizations and interventions for an archive during the process of cataloguing and digitization. We discuss this work as Research Through Design because of its associated methods some of which we adopted through our work and because of its speculative and experimental orientation. Throughout this article we use "interfaces" to refer to the online catalogue interfaces we were developing. We refer to aspects of this interface work as "visualization" where it is specifically data driven and involving graphical representation.

Crucially, by considering the process of archiving as live and taking this as the focus of our design interventions we address an area of concern to archival institutions [Dooley 2013]. That is, we take the incompleteness and long time scales of archiving as features of interest, not as problems to be overcome. In doing so we identify benefits for design researchers working collaboratively with archivists and for producing aesthetically and critically interesting designs. We therefore hope that aspects of our approach are repeatable by other designers, for other archives.

We contribute:

- A definition of archival liveness emphasizing its formal qualities.
- A description of Research Through Design work undertaken to develop the above.
- A discussion of the implications of archival liveness and the benefits of applying it in the design of archive and collection interfaces.

Motivation

Our research comes at a time when an interest in the theoretical and critical concerns around archives has begun to pervade discussions of designing for the archive. This tendency reflects themes in archive-oriented humanities scholarship, since the early 1990's in particular [Derrida 1995], about the role of archives as repositories of culture and archivists and institutions as producers of versions of the past [Hardiman 2009]. As archival practice has become increasingly mediated by digital technologies, these themes have become of key interest to scholars positioning their work in terms of the Digital Humanities e.g. [Drucker 2013] [Kirschenbaum 2008]. Thus a converging set of theoretical concerns, disciplines and epistemologies center on the technologies and practices of archiving, and their relationship to older critical perspectives from the humanities. The overlap of Human Computer Interaction (HCI) and Interaction Design research with concerns from the Digital Humanities represents a compelling opportunity for inter-disciplinary research.

Project Context

Our research was conducted in the context of an eighteen-month-long research project. At the outset our university had recently acquired the archive of a publisher of contemporary poetry, Bloodaxe Books, consisting of around 60,000 items (see Figure 1), mostly edited manuscripts of poems.

Figure 1. The Un-catalogued Archive

We were engaged to produce experimental interface design research as part of an inter-disciplinary team together with other researchers from the creative arts and humanities. Around thirty project participants, mostly poets themselves, were engaged in personal, creative-practice research in the archive. Importantly, the archive itself was in a completely un-catalogued state at the start of the project. Research was consequently being conducted *in parallel* to the cataloguing and digitization process and we will contend that this contemporaneity afforded a range of creative and technical opportunities that helped us explore, describe and use the concept of archival liveness.

BACKGROUND

Liveness

Liveness has been productively recognized as a concept in the field of HCI and has been investigated across areas including live electronic music [Hook, Schofield, and Taylor 2012] [Hook 2013], interactive art [Taylor 2011] [Reeves, Benford, and Malley 2005], and TV production [Bartindale and Oliver 2009] sometimes looking to theatre and performance art for comparison [Auslander 2008]. Liveness has been shown to have significant implications for user experience, particularly of live events. Some authors have suggested that work remains in considering liveness in interaction more broadly. During the early phases of our research we were frequently confronted with a number of technical and experiential ways that the archive could be considered as subject to live processes (such as the ongoing activities of digitization and cataloguing) and indeed, could be considered itself as "live". These considerations lead us to consider notions of archival liveness and its possible application to the study of the user experience of archives, collections and their interfaces.

Previous accounts of liveness [Hook, Schofield, and Taylor 2012] [Hook 2013] [Taylor 2011] [Reeves, Benford, and Malley 2005] [Bartindale and Oliver 2009] describe how a sense of liveness can be achieved and supported, and emphasise the power of a feeling of liveness to affect experiences of technologically mediated events. Definitions of liveness as "…the properties of intimacy and immediacy experienced by both spectators and performers" [Hook, Schofield, and Taylor 2012] are calibrated to evoke interpersonal, affective encounters. However the more recent use of the term in the context of data visualization [Jacobs 2013] provokes a reconsideration of its features of interest away from performance. An expanded sense of liveness has the potential to inform interaction design more broadly [Hook,

Schofield, and Taylor 2012]. The study of liveness has, in summary, hitherto focused primarily on the *experience* of liveness, through which performances, art or entertainment are lived.

In the context of data-driven technological experiences (such as viewing or using visualization) however, an account of how the formal characteristics of the supporting infrastructure actually contribute to the phenomenon of liveness is so far under-developed. As part of our second contribution, we develop this formal description and describe the role it played in affording opportunities for design. In this sense we find commonality with research in live electronic music, in particular Freeth et al. [Freeth, Bowers, and Hogg 2014] who describe how the experience of a live, networked, collaborative musical composition is shaped by the technical constraints of the system. Others [Tanaka 2000] have suggested that such constraints should be seen as features of particular material interest and be viewed as aesthetically integral to the piece of music, rather than being viewed as problems. In the study presented herein we follow prior work e.g. [Tanaka 2000] [Freeth, Bowers, and Hogg 2014] by seeing such technological materiality as part of the landscape of what makes the archive a particular kind of *live*.

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Archive and Collections Interface Design

Concerns about the power of archives to produce particular versions of our cultural past [Hardiman 2009] have motivated some researchers to adopt participatory design (PD) or similar approaches to involving future users of archives in the design process. Doing so raises a series of complex questions regarding the stakeholders in such archives (whose archive is it?) and their relationship to archival standards (by whose terms should the items be described?). Featherstone asks "should the focus be on received traditions and the canon, or on local knowledge and diversity?" [Featherstone 2006], and a number of research projects have opted emphatically for the latter. Povinelli [Povinelli 2011] describes the production of an archive of cultural information with and about indigenous Australians. The interface to this archive attempted to recreate patterns of knowledge sharing (and exclusion) particular to the group in question. Huvila [Huvila 2008] highlights the importance of knowledge held by future users of an archive of local history and describes its integration into the design of a records management system. These explicitly participatory projects come with a considerable commitment in time and resources. Although these results are valuable, we suggest that there is scope for approaches which are responsive to users but without the sometimes prohibitive costs involved in pure PD processes. One such process is described by Feinberg [Feinberg 2012] who suggests a notion of "dialogue" between collections interface designer (as author) and user (as audience).

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With the integration of archival record keeping and networked technologies (such as document-storing servers, online record aggregators [JISC], and front-end collection interfaces) [Hedstrom 2002, 21] Hedstrom notes that as a "critical node" in the relationship between archive, archivist and user, archival interfaces are implicated in the interconnections between power, institution, memory and artefact described above. As well as the decisions taken by archivists as to inclusion, preservation, access and description, a set of further considerations inform the presentation and curation of archives. Such considerations encompass interface design, data management strategy and access policy and are a site of potential interdisciplinary collaboration and user engagement. The context of a research project afforded us an opportunity to pursue creative exploratory work in this design space.

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Background: Summary

We have seen first that liveness has been of interest in design communities in providing clues about the experience of live performance and interaction. Significantly, we have noted that we can develop the concept of liveness in the archive by supporting the discussion of experience with a description of some of the formal features of the archival process which contribute to the phenomenon of liveness. The development of designs exploring archival liveness is proposed as a useful contribution to the rich but complicated design space of archival interfaces.

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Starting the design process

Research Through Design

We adopted a Research Through Design methodology as exemplified by Frayling, Gaver, Bowers and others [Frayling

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1994] [Gaver 2012] [Bowers 2012], in that artefacts produced "allow a range of topical, procedural, pragmatic and conceptual insights to be articulated" [Gaver 2012]. Research Through Design has been demonstrated as compatible with a critical [Bardzell 2013] orientation which is consistent with our aims to consider how archival liveness might support the production of a more open, experimental or creative engagement with archival materials. Our approach is critical in that we propose archival liveness as a concept through which to query existing design practices in archive interfaces and to provide pathways towards new kinds of design.

In the following we describe four distinct design activities: Archive Inserts, Box Log Connections, The Marginalia Machine and a Twitter bot. These activities were conducted on an overlapping timeline; here we present them in a roughly chronological sequence that shows their formative role in developing our understanding of archival liveness.

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In The Archive

Inspired by previous Research Through Design work [Gaver 2007] [Gaver 2004] we conceived of a "cultural probes" activity to gain insight into the way the archive was being used by our project participants and to uncover some of the things they found interesting about the materials themselves. As poets with substantial domain knowledge they could be considered as "lead users" [Von Hippel 1986] with the potential to give insight informing future designs for a broader group.

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With our project partners we also held a series of four, hour-long discussion meetings with groups of around ten participants at a time. These meetings were audio recorded and transcribed. In the following section we draw on the probing activity and the results of the discussion together. We emphasize that these activities were undertaken not as information gathering or requirements analysis activities per se, but to sensitize ourselves to the material and its prospective users. That is to say our discussions were not directed towards user requirements specifically but instead tried to get some flavor of their experience in the archive.

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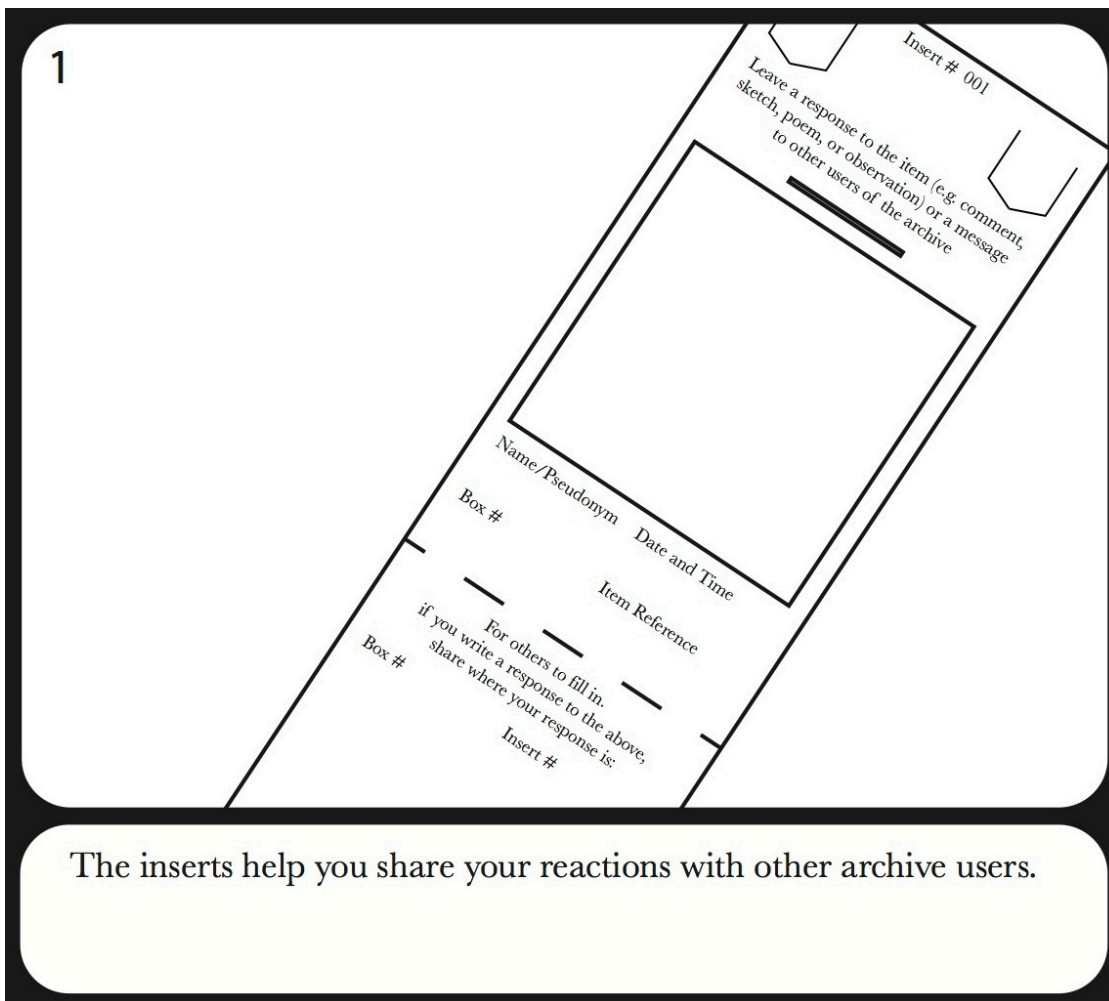
Figure 2. Detail of the Instructions for our Probing Activity Showing one of the Archive Insert Probes

Towards this end we also spent time physically situated in the archive ourselves. We observed during this period that the library silence imposed by the archive's location in the university "Special Collections" room meant that participants who were potentially conducting related research were unable to communicate. Indeed a participant commented during a session that, [19]

"Both times that I have been to the archive, I have requested a box and I was emailed back that somebody else had requested a box the same as me. So I got this strange feeling that there was this other me, who was interested in the same things that I am interested in. I think the fact that we were actually going to the same session, and wanting the same box for it, I started to feel a bit weird about it." [20]

Partly in response to this scenario, we created a probing activity, "Archive Inserts" (see Figure 2) which used a bookmark-like insert to act as a conversation "backchannel" for participants. A trial of this activity revealed a number of interesting features of the archive which focused our interests and informed future designs. [21]

We scanned the completed inserts and conducted a basic thematic analysis, sorting results into the following categories; "materiality", "typographical", "literary criticism", "questions about the cataloguing process", "poems" (several participants chose to leave poems for others to find), "links between items", "illustrations" (several participants drew pictures of what they found) and "declarations" (comments which didn't appear to solicit a particular response). [22]

Probe Findings

There were two principal outcomes from our analysis. First: it was clear that temporality was a significant factor in the participants' experience of the archive. Second: virtually all of the aspects identified as interesting by the participants [23]

were not intended to be described in metadata in the forthcoming catalogue, and thus would not be represented in future interfaces to the archive. This latter observation is fundamental to the value we identify for a Research Through Design process in this context. These outcomes are described further below.

Temporality

A number of comments from participants suggested that being in the archive conveyed a sense of temporal connection with the people and events of the past. One participant jokes that the editor of Bloodaxe, was figuratively "looking over their shoulder". [24]

"…suddenly I became aware of somebody stood next to me and it was Neil! I felt as though I'd been caught out. Then I thought perhaps I'd conjured him up!" [25]

Remember the bird you once held on your palm,
how it struggled to fly? Its hot hard feathers
in panic-flutter were striped with the same pale
onyx colours as

shingle under almost invisible waves,
or smooth skin sliding through my practiced fingers.
The bird was blinded by fear. ~~Your eyes are blurred~~
in expectation.   *But your eyes blur*

Figure 3. Detail of a Manuscript (by Ruth Fainlight) with Editorial Notes

Similarly, a number of participants discussed the importance of the historical situatedness of the items. They speculated on the circumstances under which items were produced and this speculation was a significant facet in their experience of archival research. One item (a manuscript by the Russian poet Anna Akhmatova) prompted the writer of one probe insert to ask: "What was the process for the publisher to publish a book by a political prisoner still serving time?" Another speaking during our discussion describes the interconnection, for them, of wrapping materials and past events. [26]

"Picking up on the idea of an aura that's added by the fact that this material has suddenly become a part of history. I got really interested in the wrappers that material was in, in the box that I called up yesterday. It had half in envelopes which were the envelopes that the manuscript seems to have been sent in originally, so that there was that history of a poet addressing an envelope and putting a stamp on the packet." [27]

Materiality

The interest in the material aspects of the archive described by the participant above was a recurrent point raised both in discussion and in the probing activity. [28]

"I just think that's really interesting when you're then going into an archive, when you are seeing things that are finished on the page, but still having this other voice of the handwritten notes or the handwritten marginalia, or somebody else's marginalia. Coming in and still being in dialogue in those tiny and precise ways right to the very end. I am very much interested in the voice of the handwritten note and in marginalia generally." [29]

The items in the Bloodaxe archive are mostly late stage proofs of poems, often similar to the published versions of the work. The two significant differentiating factors therefore are first, the quality of the printed material in the forms of paper densities and grades, the marks of varying kinds of typewriter, word-processor and printer and second, the handwritten editorial notes (see Figure 3). These latter when inscribed in the margins are termed "marginalia" in archival parlance. The marginalia were interesting to us, firstly because they were interesting to participants and secondly because of the link described above between marginalia and the *temporal* sense of the archive. We decided to adopt the marginalia (taken in an expanded sense to include all marks which were not printed characters) as the material in a process through which we explore archival liveness.

Cataloguing Process

We have already described the importance of the archival catalogue and interface as "critical nodes" [Hedstrom 2002, 21] in the relationship between materials and the significance of archives in culture. A final group of quotes highlight the concern felt by some participants over the processes by which items were to be archived and made available. One participant, writing in a probe insert, had misunderstood the cataloguing process.

"there isn't an archive number, this is because it is an unpublished work […] Are unpublished works going to remain uncatalogued? Does this make the item invisible?"

The item in question had no "archive number" because the archive, at this stage, was in a semi-catalogued state and the item in question had not yet been catalogued. Also the state of publication has no bearing on whether items are catalogued (though it may affect their inclusion in an interface due to copyright issues). Another participant expressed concerns during our discussion over management practices for future items.

"…what's interesting is that the correspondence is fascinating, nobody prints correspondence anymore. All of the current correspondence will be on email, so I'm wondering what the onward strategy at Bloodaxe is for retaining that, because that would be gone."

These comments reinforced our early justification for designing within the archive during the cataloguing process and contributed to our growing definition of archival liveness in that they strongly associate the degree of definitiveness of the catalogue with a sense of time.

Preparing for Design

Our work with participants had revealed a number of features of interest in the archive that informed our designs. First our sense of the vital importance of the temporality of archive materials was clearly shared by participants. Second, the aspects of materiality valued by the participants presented us with some clear ideas about what kinds of material to work with. Lastly the comments about the relationship between materials and the ongoing cataloguing supported our earlier impression that presenting the archive during the cataloguing process might engage users at this critical and contested stage.

DESIGN INTERVENTIONS

Design Work

Having spent time in the archive and with project participants we developed two main design proposals both of which adopted the archival marginalia as a starting point for a creative design intervention. A further design was produced early in this process and is described separately. Although neither of the former two was in itself an interface design, both were produced to "lead" to the catalogue and future interfaces to it in different ways. The first design intervention was a live Twitter bot, connected to the digitization process in the library (see Figure 4). The server running the bot uses machine learning techniques to separate handwritten notes and illustrations before tweeting the resulting image with a link back to a catalogue page with basic catalogue information. The detection of this marginalia relies on the results of optical character recognition (OCR) as performed by the Tesseract OCR engine [Smith 2007].

Figure 4. Screen Grab of a Marginalia Tweet

OCR detects typewritten symbols, associating a level of detection confidence with each symbol. This allows estimation of the expected colour and dimensions of typewritten symbols for a given document. Regions of content either ignored by OCR or whose colour and/or dimensions lie outside the expected range for typewritten symbols are then deemed to be marginalia.

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The second intervention was an artwork, the Marginalia Machine (see Figure 5). The Marginalia Machine is an "X/Y" or "Cartesian" plotter which draws details [1] of the marginalia on a continuous scroll of paper. It was displayed during "Poetry International" an internationally recognized festival of poetry at the Southbank Centre, London, UK.

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The Marginalia Machine is based on a kit of parts sold by Makeblock [Makeblock 2014] which was significantly modified and improved. We added stabilizing belts and pulleys and designed a paper roller mechanism that would advance after each document was drawn. The Marginalia Machine was controlled by an Arduino microcontroller in serial communication with a Java application which we wrote specifically for the project. This application sent a series of point coordinates combined with "pen up" or "pen down" messages. To produce these coordinates we wrote a Python script which vectorised the marginalia images (produced as described above) and produced an XML document of coordinate data. A supporting documentation video, shown in the gallery space, described the technological processes behind the machine and its context in our design research.
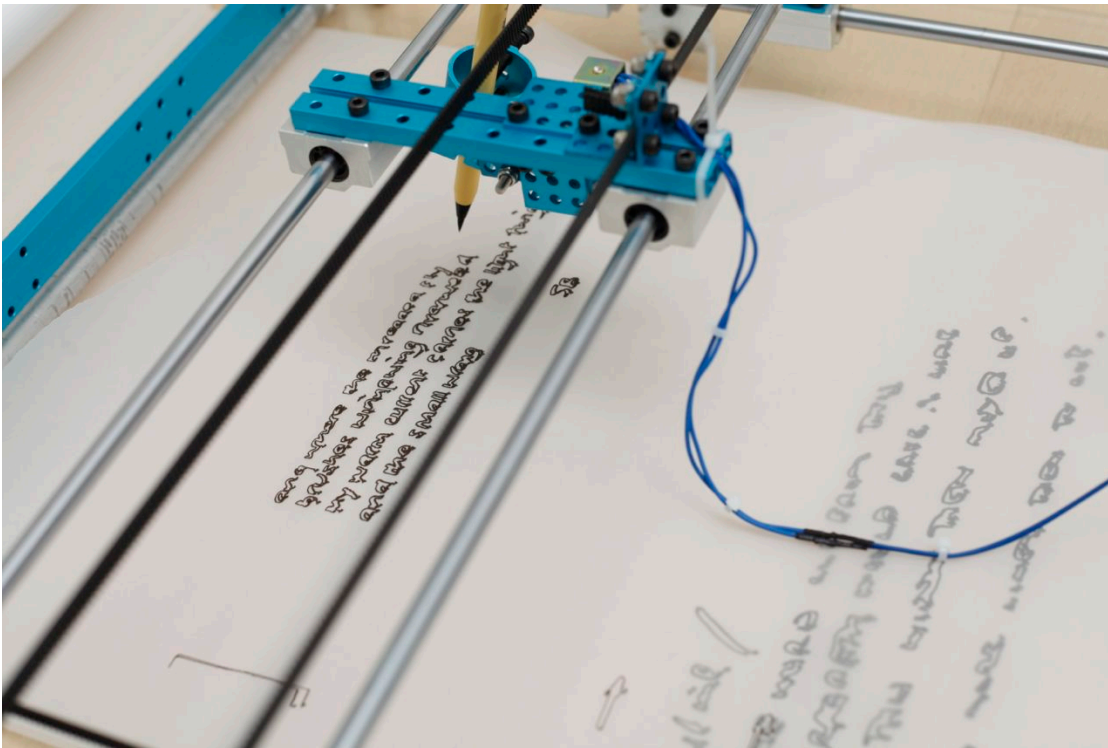
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Figure 5. Detail of the Marginalia Machine

Uncovering Liveness

The design process afforded a number of insights that support our contribution of a definition of archival liveness. As we developed our designs, a set of three "sites of liveness" emerged, each with its own, idiosyncratic sense of liveness. These were: the special collections area of the library itself, the server infrastructure that would host aspects of our design interventions, and the manifestations of our designs on Twitter and in the gallery.

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Working Hours, Working Rhythms

The production of both the Marginalia Machine and the Twitter bot entailed a long, friendly, and respectful exchange between ourselves and the professional archivist and digital assistant in the library. This relationship and the practices it uncovered informed our developing sense of archival liveness. A challenge of working with archival materials during the cataloguing process is that access to those materials and sources of metadata must be negotiated and then technically facilitated before formal procedures are in place or perhaps circumventing existing procedures. In the Bloodaxe Archive a conventional workflow was in place wherein items were catalogued and scanned, and image files converted for preservation. The cataloguing was conducted using a web-based tool which eventually aggregates the collection with other UK archives. This kind of workflow is based on a long production cycle and with the assumption that the catalogue will be published near the end of the cataloguing process. Further, there was little formal connection between the catalogue and digitized files. Although they were connected by reference numbers, the digitized items were not seen as part of the archive, but as illustrations for the catalogue.

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The cataloguing and digitization process as described above had a distinct *kind* of temporality associated with it. It was based on batch processing, a strict sequencing of cataloguing and digitization and an ultimate cycle of around eighteen months (after which point the funding would be exhausted). We felt that this rigid timescale concealed a host of rich features of the archiving process by effectively silencing the project until its conclusion. In this sense the "liveness" of the archive was suppressed.

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Despite the formality of this workflow, we were aware that a parallel set of informal organizational practices were at work in the library. For instance the archivist preferred to keep her catalogue in spreadsheets before transferring new records

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to the records management software at the end of the month. The digital assistant meanwhile had a complex but well-defined folder structure by which she kept track of which documents had been scanned, converted, uploaded and saved. Through regular contact we were able to negotiate access to these intermediate working structures in order to engage with the processes behind the production of an archive. While doing so we were careful to communicate our intentions to the archive staff so that they understood that these areas were to be partly made public. An example of one outcome of this access can be seen in a visualization[2] we produced for the participants.

The visualization shows relations between the roughly sorted boxes (see Figure 6) in which the archive was delivered to the university. If an author or title is in both box 6 and box 15, for instance, this connection will be drawn on the graph and a list produced on the right hand side. Also visible in the image is a figure for the most popular (as in most viewed by participants) box (44 in this case). While ostensibly a tool by which participants could more efficiently search the boxes, this visualization also served the purpose of showing a pre-catalogued representation of the archive; the archive in its nascent state. As such it was a "time marker" in the process of archive creation. More importantly for our argument it was made possible by access to two items; an informal spreadsheet provided by the vendors of the archive, Bloodaxe Books, and a Microsoft Word document in which the archivist recorded the participants' archive box requests. Neither were part of the formal cataloguing process but *working documents* used by the archivist as part of her day-to-day job. Opportunistic access allowed us to extract the data from those documents *in situ* on the archivist's working server space, and from there to make it available. We suggest that such documents which support the daily work of the archive are themselves *indicators of liveness*.
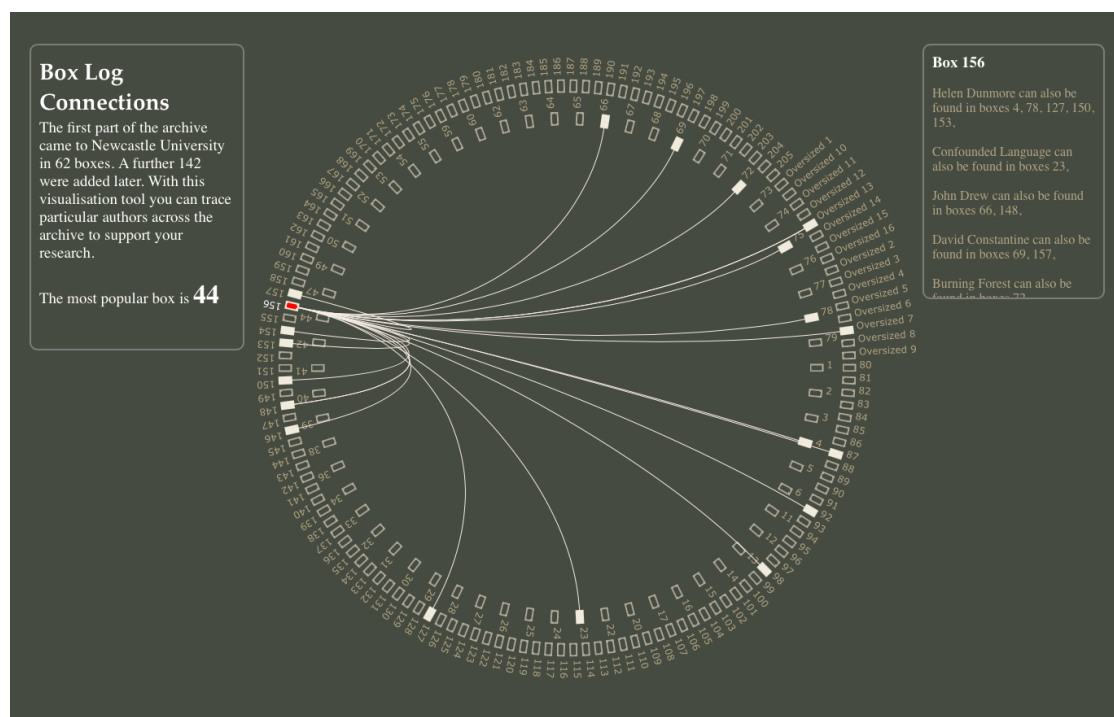

Figure 6. Visualization of Archive Box Connections

The approach taken with the Box Connections visualization influenced the development of the Marginalia Machine and the Twitter bot. Having become familiar with the archival activity in the library we became interested in releasing materials as and when they were produced rather than at the end of the envisaged production cycle. By releasing images early and often, alongside what parts of the catalogue existed, we were attempting to provide indices to archiving *as a live process*.

Scripts and Servers

In order to achieve the above we developed a technical framework to support our intervention. The particular affordances of the technologies involved also played a significant role in developing our characterization of archival

liveness. Such affordances defined this "site for work". We explored, tinkered with and organized those technologies according to a mixture of technical criteria (what will be stable) and aesthetic and theoretical ones (what organization of technical resources would most aptly reflect the work in the archive). By doing so, a sense of the human inflected our technical work, just as technical considerations inflect the (human) work of the archivist and digital assistant. That is to say that archival liveness reflects an integrated set of technical and human factors which together define the particular kinds of time in the archive.

Both the Twitter bot and the Marginalia Machine were intended to respond to the digitization of new images in the Bloodaxe archive. To make this possible we developed scripts that would scan a working folder on the server space of the digital assistant. With her consent, we asked the university technical services for read-only permission to this shared storage. Similarly, we wrote scripts to convert exports of the catalogue to a data structure to support a work in progress online catalogue. We emphasize these points because they are germane to our wider discussion that our process was not part of the envisaged production flow for the archive. We further suggest that these opportunistic technical interventions take advantage of the "mess" described by Dourish & Bell 2011 [Dourish and Bell 2012] as fundamental to the character of contemporary networked technology. ⁴⁸
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To check the status of the shared folder we wrote a simple shell script triggered by a Cron process. Cron is a Unix tool for scheduling the execution of scripts, but it comes with its own temporal constraints. It is designed for regular tasks and accordingly can be scheduled to run on the minute (at the most), on the hour (or n minutes afterwards), everyday and so forth. In that sense Cron became part of the temporal range of archiving activities as we connected it to our designs. While a scheduled check seems to break the immediacy implicit in the notion of liveness, we felt that "live" does not necessarily imply "continuous". The archive is live insofar as it is an ongoing process. Breaks and pauses such as those introduced by Cron are part of the *texture* of its liveness. Although it might be argued that Cron processes are not part of the core of the archive, we argue that its use as a scheduling process as part of the technological infrastructure of the archive effectively defines it as such. In this sense by using Cron as part of our design intervention we were making an *aesthetic claim* that this kind of time should be part of the texture of archival liveness in this archive.
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Having chosen this approach we encountered another significant temporal feature of the technologies. Our script cross referenced each item in the shared folder (of multipage scanned PDFs) with each item in another folder, where extracted and compressed JPEG versions were stored, in order to identify new PDF files. This process itself was lengthy because of the volume of files involved, taking around half an hour to run. Once a new file was found, a series of further processes added to the execution time. First the PDF was extracted to individual JPEGs using command line image processing software ImageMagick [ImageMagick]. Then the JPEGs were resized to produce thumbnails for the website. A PHP script was then called to update the catalogue with the new file information. Next a further script produced the marginalia image before finally the image was tweeted along with a link to the relevant page of the work-in-progress catalogue interface.
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The Right Time?

As well as the timeframes already described regarding the working rhythms within the library and the various running times of scripts and processes the public manifestations of our designs introduced a third temporal issue that pertained to the experience of archival liveness.
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The micro-blogging service Twitter is based on short updates which appear as a mix in a user's timeline. We were conscious of the risk that a heavy stream of updates from the archive would overload followers' timelines and alienate or annoy them. Equally however we wanted to retain a sense of the particular rhythms of the archival process, so to tightly schedule updates felt restrictive. To reconcile these two opposing concerns we allow a maximum of three marginalia images per hour to be tweeted. As this compromise shows, we sought to manage the performance of archival liveness in the public realm.
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The Marginalia Machine presented its own constraints. Because the working pattern of the digitization process is irregular, and of course takes place on weekdays, there were significant problems with presenting a live-connected version that was in synchrony with the archival process. For an artwork in a gallery, long periods of inactivity do not
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often make for a satisfying experience. To provide a satisfying experience for visitors while attempting to maintain a connection to the live archiving activity we had the Marginalia Machine draw from a bank of twenty of its most recent images. We hoped that the constant, noisy activity of the machine would be indicative of the activity of the archive even though some of the direct temporal correspondence had been broken.

DISCUSSION

Kinds of Liveness

In the previous section we described three distinct temporal facets to our work in the archive: the working rhythms of the archivist and digital assistant, the execution and scheduling times of the technologies, and the frequency with which we updated the Twitter feed and Marginalia Machine. Our motivation for these designs was to manifest the liveness of the process of archiving within our designs but a tight binding to this process was in conflict with the technical and experiential concerns we outlined. However rather than seeing this as a compromise, we suggest that archival liveness is embodied equally in these three facets and that weight should be given to each within the design process. Following Freeth and Tanaka [Freeth, Bowers, and Hogg 2014] [Tanaka 2000] we prefer to see these different temporal qualities as features of material interest. We observe that the adoption of and experimentation with such features of materials is entirely characteristic of Research Through Design processes and indeed one aspect that differentiates them from other design practices.

By distinguishing between the working rhythm of the staff in the archive and the various constraints and affordances of the server infrastructure we reflect an obvious historical tension between the working patterns of people and technologies design to support them. Rather than representing this distinction as a binary one however, our approach based in archival liveness nuanced our understanding of the particular kinds of temporality in different parts of what might be thought of as an ecosystem of work and technology. The pursuit of archival liveness, as we have said, brought us into closer contact with the archivist and digital assistant as well as the library technical services team. With this close contact we gained unusual access to the way their work was organized across a diverse technical infrastructure. We observed a disjuncture in the temporal patterns of the archival process and the way that the archive was accessed by our participant researchers. Where the archivist and digital assistant worked to long time frames with a tendency to batch processing and repetitive activity, the participants were inclined to "dip in and out" of the archive irregularly. Our intervention through Twitter in some senses mimics this comparison. After running the bot for several weeks, we noticed that in periods when digitization was taking place, tweets would commonly appear around 5pm; seemingly the digital assistant placed scanned PDFs in the "complete" folder as one of her last tasks of the day. The appearance of the tweeted marginalia image on followers' Twitter timelines however will be interspersed with other material. What was a semi-regular event for the digital assistant manifested as sporadic for the followers of the bot.

"Gearing In" Through Liveness

As well as presenting design opportunities, we note that our particular engagement also created a kind of "gearing in" [Durrant 2011] [Gurwitsch 1979] to the archiving process and the technologies around it. Durrant et al. [Durrant 2011] referencing Gurwitsch [Gurwitsch 1979] describe a scenario wherein visitors adjust to the infrastructure of a theme park as it aims to present a particular mode of experience. The process by which the visitors begin to socially organise their visit around this infrastructure is one of "gearing in". In the context of the archive we can see the progression of our design interventions from the cultural probes to box log connections, to the Twitter bot and Marginalia Machine as ways of learning to "mesh" our designs with the work of the archive. Our treatment of archival liveness was in many ways a process of orientating ourselves to the various rhythms of the archiving process and the materials available at each stage. One practical advantage of this "gearing in" was that we were able to produce engaging, timely designs at stages of the project earlier than might have been otherwise possible. More significantly, this gearing in gave us access to a rich set of materials and concepts, prompting designs that offer new modes of engagement and reflection on the archive.

Performing as a Live Archive

In this project we were focused on the liveness of the archiving activity principally because of our desire to engage users with the archiving work. However by highlighting the archiving process we were also creating a public performance of the Bloodaxe Archive as live. Liveness was being presented as part of the public identity of the archive. In this presentation, we find direct accord with other digital heritage initiatives. As archive catalogues are aggregated into web services and interfaces, a number of interesting points arise regarding the permanence and stability of archives and their expression through catalogues and interfaces. Application Programming Interfaces (APIs) such as [National Library of Australia] now provide aggregated access to the collections of thousands of institutions. The constantly changing nature of the collections defined by the scale of such aggregations suggests a particular sense of the live archive (as growing, more available, more diverse) in contrast with the "dead" one (as complete, finished and closed). The National Archives of Australia recently launched "SODA" [National Archives of Australia] a service which publishes the most recently digitized records from across their aggregated resources. The developers make the point that the constantly changing state of the catalogue makes it difficult to know which new records are available. By facilitating easy access and sharing the Archive's aim to convey a sense of the rate at which the collection is growing [National Library of Australia] they hope to engage potential users in the new content. As in our case, liveness is implicitly part of the way the public identity of the archive is performed.

Similarly, Circus Oz maintains a "Living Archive" [Circus Oz] of video and photographs of its performances since its inception in 1978. Through their "stories" tab, they emphasize the connection of the archive to the lives of the performers and audiences. By doing so they suggest that the archive is also live in the sense that is engaged with the daily lives of the people represented in it.

CONCLUSIONS

Earlier, we suggested that our work designing with and for liveness offered a response to concerns about the role of archives in institutionalising the past. In our case, the Marginalia Machine and the Twitter bot were ways of simultaneously investigating archival liveness and engaging our project participants and wider audiences with the archival process, with the work-in-progress catalogue interface design and with the project more generally. While our own work (so far) does not afford significant opportunity for users of the archive to intervene in the cataloguing process we believe that further potential for this exists.

To produce such design work has methodological implications as described but also, we feel, indicates a role for a particular kind of researcher. Such a researcher would have an interdisciplinary background, sensitizing her to the value and interest of the archival materials while bringing a range of technical and creative skills enabling different kinds of design intervention. She would be in a position to quickly conceptualize, develop, and release work in an opportunistic and occasional fashion, using the materials made available, early and often. This particular kind of working practice (one that is agile, responsive, opportunistic) may encounter difficulties at larger scales. As we have suggested, one of the values of our way of working was in supporting a kind of familiarity not only with materials and technical systems but also with the working patterns and concerns of our colleagues in the library. Much of our work was produced with what was effectively unfinished materials (the work-in-progress catalogue particularly) and this access was negotiated on a personal level. A future challenge for this work is to consider how some of the rich temporal features of archiving may translate on a scale where such negotiation is not feasible. One emergent design consideration here is how the technical tools of archivists (such as archival data base software) might be designed to reflect a variety of states of "finishedness" rather than simply being unavailable until the point of completion. It is interesting to at least speculate on the possibilities for design if the default state of catalogues in progress were accessible rather than closed. They could then be used in a timely and experimental way taking advantage of the liveness of the process of archiving.

Other aspects of our work are more broadly applicable elsewhere. Although user-oriented processes for designing archival interfaces are not without precedent e.g. in [Huvila 2008] they remain the exception. Rather than as a set of more general user experience (UX) concerns focused on usability, we indicate the suitability of Research Through Design methods as a kind of culturally sensitising activity which we maintain is appropriate, indeed necessary for designing for archive and cultural collection interfaces. We deem this sensitivity "necessary" given the vital role such interfaces have in mediating our cultural heritage. If we, as a society, are to encounter our cultural heritage in digital

forms online and elsewhere it seems appropriate to engage ourselves in a conversation about not only usability but also aesthetics and creativity informed by engagement with future users. With this inclination however we immediately encounter future questions regarding the relationship between presentation and interpretation in design work such as ours. Much of the work we produced exemplified our particular attitude to archival materials in which we see them as having value for future creativity. Although our particular interventions were informed by our work with project participants it is undeniable that in their presentation as (at least partly) creative works, we injected our own interpretative stance into their presentation. The later results of this approach can be seen online in our catalogue interface[3]. This work (which we will discuss in more detail in a forthcoming paper) combines conventional functionality such as search and filter with facets of visualisation, text-mining and image processing techniques to generatively produce connections around the archival materials.

One of the motivations for maintaining an ostensibly neutral catalogue based on international standards for record keeping is to defer the interpretative moment outside of the catalogue and its interface to allow for a plurality of approaches later on. We sympathise with this position but it is hugely problematized of course by the nature of any claims to neutrality. As Drucker [Drucker 2013] has pointed out, the design of our interfaces already embodies an epistemological commitment inherited from particular cultural traditions and emphasising hierarchy, standardization, and objectivity. With this characterisation in mind we feel that there remains a huge role for user-oriented, Research Through Design methods in exploring the line between presentation and interpretation. `62`

Archival liveness addresses a desire (and a need) for the archives and collections to make their holdings publically accessible. Digital archives are dynamic: continually expanding, taken up in larger aggregations, being re-catalogued and described. Thus, a model of design that treats the archive as static, whole, and complete is often not appropriate. With this research we have demonstrated that design interventions before or during the cataloguing and digitization process benefit from early access to a wider range of materials and have the potential to engage audiences and future users of the archive along the way. Above and beyond this though, we have demonstrated the use of archival liveness in a particular kind of Research Through Design process. Archival liveness encouraged us to treat the various temporalities of the archive as material with which to design and provided us with a number of distinct ways of "gearing in" [Durrant 2011] [Gurwitsch 1979] with the people and technologies at work in the archive. `63`

ACKNOWLEDGMENTS

Notes

[1] These were curated for the exhibition and chosen for their features of formal interest.

[2] http://bloodaxe.ncl.ac.uk/sandpit/bloodaxe_archive_box_connections/blood.php

[3] http://bloodaxe.ncl.ac.uk/

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