

Webbs on the Web: Libraries, Digital Humanities and collaboration

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1.0 Introduction

The role and use of computing in all aspects of daily life, from the personal to the professional is profoundly altering the ways that information is both discovered and used. Whether in Universities, Museums, Libraries or individuals' homes the application of computing to cultural heritage is opening a host of new opportunities for studying and engaging with an ever-increasing volume of heterogeneous cultural heritage artefacts, along with a wide range of publication genres on them and computational objects that derive from them (Warwick et al. 2012).

Within the Library and Academic worlds it is the subject that is now called Digital Humanities that has been pioneering a good deal of the research that has given rise to such changes. Answers to the question 'What is/are (the) Digital Humanities?' are many, varied and disputed. Indeed, the first 'Reader' published for Digital Humanities (DH) explored exactly this (see Terras et al. 2013). Contested as particular definitions of DH may be it is possible to make a number of general observations about its problems, methods and contexts. It is generally agreed that DH research takes place at the intersection of computing and the Humanities. Notwithstanding the ubiquity of computing in all aspects of academic life, DH usually involves specialist or emergent applications of computing tools and techniques to research problems of the Arts and Humanities. This process is necessarily a bidirectional one and so a core aspect of DH research also focuses on asking 'Humanities' questions of computational technologies and applications. The aim of such research is often to allow old questions in new ways or to allow new questions to be asked in ways that would otherwise prove impossible. For example, text analysis research has opened new ways of studying authors, as Ian Lancashire demonstrated when his computational analysis of changes in the use of vocabulary across 14 of the works of Agatha Christy led him to argue that she suffered

from dementia towards the end of her life and that this was detectable in her writing (Lancashire 2013). The use of image analysis and 3D modelling has allowed digital reconstruction and transcription of damaged manuscripts such as the Great Parchment Book (Pal et al 2013) in ways that would otherwise be impossible. Other important topics addressed by DH include areas such as text encoding and knowledge organization, spatial analysis, visualization and distant reading (see, for example, Warwick et al. 2012; Schreibman et al. 2008; Gold 2012).

The intellectual and theoretical, institutional and socio-cultural conditions required to carry out such research are often different from those of mainstream Humanities. The emphasis that DH places on hacking, tinkering and building (you are not a Digital Humanist if you don't code was recently claimed and hastily revised (Ramsay 2011) is, to some extent, forcing a rethink of divisions long-held in the Humanities between making and thinking, or epistêmê and technê (see, for example, Galey & Ruecker 2010). Interdisciplinarity and collaboration is essential to Digital Humanities for the simple reason that a single scholar can rarely possess the complete range of Humanistic and technological knowledge and skills required to implement a digital project. Accordingly, the traditional stereotype of the lone scholar in the remote archive or library (if it ever were true) is being revised as scholars engage ever more with digital resources and the interactivity and communicational affordances they offer (see Bulger et al. 2011; Deegan & McCarty 2012). While traditional Humanities research has, officially at least, been seen as the preserve of Universities and Academies, Digital Humanities research usually crosses traditional academic boundary lines between Computer Scientists, Engineers, Library, Museum and Information Professionals and Humanities Scholars (Moulin et al. 2011). With its emphasis on crowd sourcing and public outreach there can also be a greater participation of the non-specialist in DH than has recently been the norm in the Humanities (see, for example, Causer & Wallace 2012).

The necessity of repositioning libraries in light of this digital shift is clear and, as a result, institutions from across the Galleries, Libraries, Archives and Museums (GLAM) sector are grappling with multifaceted changes as they implement new skills, knowledge and working practices along with developing the social and technical infrastructures required to support such changes (Arts Council England 2012; Tenopir & Volentine 2012; Zickuhr et al. 2013; Dempsey 2012).

As the role of the library shifts away from gatekeeper of access and discovery new expertise is required within the library. Indeed the need for professional training in emerging digital skill sets remains critical (Auckland 2012; DigCurV 2013; Lyon 2012). New models

of library service are also emerging to support new research methods, workflows, and expectations. While providing the requisite infrastructures and platforms the library is also, in line with its traditional mandate, ensuring the preservation of primary data sources along with outputs of research process such as new datasets and records of scholarly communications like emails and social media. In each case, whether it is a newly emerging role or a traditional role cast anew, we can observe the reorientation of the library within the community of researchers, locally and pan-institutionally, through the creation of new staff posts and organisational structures to support innovation and embedding of digital services. While national libraries have been involved in digital initiatives for a number of years, strategic realignment around the digital has only recently become visible (British Library 2010; Institute of Museum and Library Services 2009) . Indeed, Academic libraries have supported the open access agenda since its inception, but are only now creating posts to support digital preservation, research data curation, and user experience. The result is that new possibilities for collaboration are being opened up, for example between librarians and digital humanists and, as will be illustrated below with reference to the Webbs on the Web project, such collaborations are allowing new knowledge to be created at the intersections of academic research and professional practice

These broad shifts are exemplified in the LSE Digital Library, where the collection, preservation, and online dissemination of all digital material added to library collections (including the products of digitisation projects and born-digital acquisitions) is funded from core library budget. In essence this demonstrates LSE's commitment to the sustainable development of new working practices, skills, and infrastructure. This has necessitated a programme of organisational change which has led to the creation of new posts, changes to existing organisational structures, the reskilling of existing teams and secondment of staff from across the library to lead and contribute to innovation projects. Services that have been developed and embedded include preservation infrastructure and online interfaces for discovery of digital collections (LSE 2014a), collection- or format-specific functionality for textual comparison (see below) and location-based retrieval and rendering (LSE 2014b), mobile content delivery (Carroll 2013), collection visualisation (Carroll 2014) and enhanced information skills training incorporating data curation awareness-raising materials targeted at the research community of the institution and potential depositors of research data or publications (Raggett 2012)

These shifts are of increasing concern to the DH community not only for the practical reason that its practitioners are to be found across both the GLAM sector and Academia but

also because such changes carry with them a range of practical and conceptual consequences. Practical implications include questions about curriculum design: what are the crucial skills and expertise that the Digital Humanists we are training today need to have so that they may be better equipped for navigating and shaping the increasingly porous boundaries between the digital library and academic research? On a conceptual level the questions that are raised include ones about disciplinary and professional identity: how can such developments allow us to renegotiate entrenched (and increasingly artificial) boundary lines between those who do research and those who are the custodians of it?

This issue is one that has been discussed in a number of recent publications. For example, Prescott has argued:

Whereas the modern university segregated scholarship from curation, demoting the latter to a secondary, supportive role, and sending curators into exile within museums, archives, and libraries, the Digital Humanities revolution promotes a fundamental reshaping of the research and teaching landscape. It recasts the scholar as curator and the curator as scholar. (Prescott 2012)

Here it is important to briefly note the wider context of his remarks. Today it has become more common for those who care for collections to be trained to manage them rather than take a scholarly interest in their content. This is arguably related to the etiolating of the concept of the 'subject librarian'. The outcome, which is relevant to this paper, is that some present day academic librarians are less able than their predecessors to assist researchers in terms of knowledge of their collection content. This stands in contrasts with museums, galleries and archives, for example, where subject expertise and content knowledge is fundamental for curators to be able to do their job and satisfy user needs¹.

A European Science Foundation report similarly emphasizes the connections that must be forged between DH, traditional and digital libraries:

The establishment of partnerships and productive alliances across communities and institutions (scholarly community/libraries/ archives/museums) based on equality, a shared working vocabulary and mutually beneficial collaboration (such a cooperation platform can be perceived as being an infrastructure in itself) (Moulin et al. 2011).

¹ The authors wish to thank the anonymous peer reviewer who raised this point and asked for it to be added to the paper.

Nevertheless, some uncertainty (Showers 2012) still attends this issue and the practicalities of its implementation, according to Rutner et al:

To many in the history field and in libraries, it is unclear what the role of the library should be in digital humanities. This is not to imply that there is no role for libraries – only that this role has not yet been widely developed and adopted effectively. Libraries remain very much in transition when it comes to expanding models for supporting research on campus (Rutner & Schonfeld 2012).

It is notable that a number of publications have recently appeared which address the topic in a theoretical or more abstract way but examples of actual practice, are just beginning to be documented; this may well be a contributing factor to such uncertainty.

A recent THATCamp on the topic of DH & Libraries coincided with the 2012 Digital Library Federation Forum meeting and discussed collaborative activities with DH that digital library experts might engage in and the emphasis was on what librarians may contribute to DH ‘as experts and scholars in their own right’ (Dalmau 2013). Most recently, a special edition of the *Journal of Library Administration* has considered a number of facets of this question. For example, it included a conceptual model of the connections between libraries and DH (Sula 2013); administrative and institutional barriers to doing DH in library settings (Posner 2013); creating positive collaborations between DH and libraries (Vandegrift & Varner 2013) and library-based DH Skunkworks, which are semi-independent research-and-development labs staffed with librarians who act as scholar-practitioners” (Nowviskie 2013). This special issue prompted such wide-ranging interest in the library and Digital Humanities worlds that a response (Coble 2013) and open access versions of the articles included in it was subsequently published by the dh+lib group. This group aims “to provide a communal space where librarians, archivists, LIS graduate students, and information specialists of all stripes can contribute to a conversation about digital humanities and libraries” (Coble et al. n.D.)

Here we seek to make a contribution to this debate by presenting a case study of the ‘Webbs on the Web’ project and its wider context in the LSE Digital Library. Throughout, we describe the collaborations that underpinned this work, namely between the LSE Digital Library, Archive, and Bibliographic Services and teams within the LSE library; the UCL Department of Information studies (hereafter UCL DIS) and the UCL Centre for Digital Humanities (UCLDH); and the private companies who supplied the digitisation, transcription, and information architecture/user experience (IA/UX) services. Section 2 provides an overview of the project; section 3 describes the user experience approaches

which were integral to establishing and testing functional requirements; sections 4 and 5 describe the collaboration with the private sector and between academic and library partners in more detail; and section 6 presents conclusions and lessons learnt to inform the development of similar collaborations and digital cultural practice.

2.0 Webbs on the Web: an overview

The manuscript and printed works of Sidney and Beatrice Webb are among the founding collections of the Library at LSE. To this day their works are regularly requested by researchers and Beatrice Webb's extensive diary is a key resource for research into a wide range of subjects including, among others, politics in the late 19th and early 20th century, industrial relations, the role of women in society and family relationships.

The Webb diaries were chosen as the launch collection for the new LSE Digital Library; funding from the Webb Memorial Trust supported the digitisation of the collection. The outcome, 'Webbs on the Web' provides a single gateway to the works (published and unpublished) of Beatrice and Sidney Webb. It comprises:

- A bibliography of published works with links to digital versions where they are available
- Online access to the digitized transcriptions and manuscripts versions of Beatrice Webb's diary with browsing, full-text search, and textual comparison capability
- An online gallery of images of Beatrice and Sidney Webb drawn from existing digital collections

The diaries exist in two versions: an original manuscript of c. 9,000 pages, containing many corrections and alterations, and a typescript version which is an edited version of the manuscript running to 8,000 pages.

Both versions were scanned according to current LSE policy which specifies acceptable formats and standards based on the nature and condition of the original. In the case of the typescript diaries, Optical Character Recognition (OCR) produced acceptable results (>90% accuracy) but the technology remains inappropriate for handwritten materials and so other ways to make the manuscript diaries discoverable were explored. The legibility of the handwriting in the manuscript diaries made full transcription impractical, but it was possible to identify section breaks which marked date entries, a feature that could also be easily identified in the typescript diaries. The decision was taken to manually transcribe these date markers from both versions, along with the full-text of the typescript. Machine processing with further manual correction was then used to relate a page in the manuscript

version to its equivalent in the transcription. This made it possible to retrieve the corresponding manuscript entry when reading from the typescript and vice versa (this is not necessarily page-by-page, as there is not a one-to-one correlation, the corresponding entry by date is retrieved). In this way, a search of the full-text can be performed on the typescript version; the manuscript version, for which full-text transcription does not exist, can be displayed alongside. As well as enhancing the discoverability of the manuscript this opens up the manuscript and typescript versions for textual comparison and allows alterations and disparities to be identified. This also emphasises the artefactual properties of the original manuscript that are either missed from or difficult to express in the typescript version, for example, the varying legibility of handwriting which can be indicative of the emotional or personal context at the time of writing as well as inserts of photographs or press cuttings. LSE Digital Library provides both a portal to the collected works of Beatrice and Sidney Webb ((LSE Digital Library 2013) and a platform that supports the affordances described above. The high resolution images and transcribed text (in TIFF and TEI-XML) are preserved by the library in other parts of the Digital Library and available for researchers who wish to make use of their own tools and processing on the collection. The use of a Creative Commons licence encourages reuse and similar openness from anyone who uses the materials in other contexts. In the next section we will describe the collaborations that underpinned this project more fully.

3.0 Usability testing

Usability testing can be defined as

Objectively judge[ing] quality by measuring the performance of a document, in actual use, against conventional figures of merit. [For example] How quickly can readers find facts in the hypertext? How well do they score on tests? Do readers report liking or disliking their encounter with the work? (Eastgate Systems 2005)

Central methodologies include the use of Focused Groups, Think Out Loud protocols, **structured questionnaires and tasks (for an overview of the many methods that can be used to study users see, for example, (Ruecker et al. 2011; Blandford & Attfield 2010; Oxford Internet Institute n.d.).** User experience (UX) testing is often considered to include further emphasis on the subjective emotions of the individual user (Law et al. 2009). To a large degree the **terms Usability and User experience (UX) testing are used interchangeably by those who work in the field. The project made use of various techniques from these disciplines and the collaborative aspects of deploying these**

approaches are described in this section. However, we do not critically analyse the reasons for selecting these approaches over others for reasons of brevity and our focus on collaboration rather than technique.

In general, the uptake of digital resources in the Humanities has been somewhat slower than in other disciplines; Warwick has drawn attention to the relative absence, until recent times at least, of usability testing of DH resources. She argues that a lack of awareness of user needs and expectations has been a contributing factor to low take up: “if users are consulted, and researchers take the time to understand their working culture and how digital resources fit into it, there is the possibility that attitudes to and levels of digital resource use may change” (Warwick 2012). Of course this experience in DH stands in some contrast to the wider Archives sector where user studies have a longer history as evidenced, for example, by a number of articles on user studies of digital resources were published in the *Journal of the Society of Archivists* in the early 2000s.

From the perspective of LSE, user testing of the Webbs on the Web project was seen as a desideratum so as to ensure that the resulting resource would actually be used by the research community and, within the parameters of the aims of the project, that it would meet their expectations. This aim also intersected with the strategic interests of UCL DIS. In the recently established MA/MSc in DH at UCL we aim to impress upon our students the importance of user testing of digital resources and to give guidance in the ways that it can be implemented. Furthermore, we aim to integrate ‘real world’ examinations and exercises into the teaching of the programme. Thus, the Webbs on the Web project offered an excellent opportunity for our students to engage in ‘hands on’, real-world user testing and to receive feedback about the contribution that their emerging skills were able to bring to a digital project.

The two strands of work on LSE Digital Library, the digitization of content and the preparation of the overarching interface and visual design (hereafter IA/visual design), were run in parallel but requirements were broadly gathered in isolation. Once the prototyping and iterative production stages were underway user testing and revisions to functionality were aligned.

At the overarching level of the LSE Digital Library, requirements for its IA/visual design emerged primarily from consideration of cross-collection functionality (for discovery and navigation) with an emphasis on supporting horizontal and vertical approaches to a variety of content, with authority through brand and exhibition space being important considerations. In contrast, the requirements of the Webbs on the Web project were anchored

firmly in DH theory and practice (see below) and the emphasis was on facilitating interactions with the textual content of the diary versions. Although approached from different perspectives, in user testing these approaches found synergy, and user groups involved with testing were asked to consider both platform-level and corpus/item-level functionality as part of a cohesive experience.

The user testing focused on three areas primarily:

- navigation (i.e. the relative ease with which information could be discovered and the paths taken by website users in order to discover that information)
- search (retrieval performance of the indexing engine)
- item-level functionality (for example, the use of page-turner software to view individual items within the collection and carry out textual analysis between versions)

In line with the target audience of LSE Digital Library (which includes undergraduate and postgraduate (taught and research) students, academic (teaching and research) staff, external visitors and alumni), a representative range of users were included in the user testing. These included, in a progressive fashion scaling up the number and diversity of participants:

- The internal technical team of the project (5 people)
- The expert and stakeholder group (c.20 people)
- LSE Library staff (c. 20 people)
- UCLDH and UCL DIS postgraduate students (c. 60 students)
- Other externals (>100 people)

This scaling of participation in user testing supported iterative revisions and releases of functionality, such that the smaller, expert groups could both influence big decisions quickly and catch obvious problems with the IA or visual design through richer, qualitative feedback methods. This way the opinion of larger groups could be used to refine detail through gauging subtlety of opinion using quantitative methods such as surveys, rather than being overwhelmed by repetitive and/or conflicting responses that provided no clear way to progress without expert decision making.

By the time of testing with the wider Library staff and UCL DIS postgraduate students, important pieces of the IA and visual design were in place, but important questions remained. Both groups used the same test script which contains questions in the areas described above; however, we found that the responses of each group focused on their respective areas of interest. Librarians tended to give more detailed criticism of search and retrieval accuracy, including the presence of tools to aid with discovery such as facets or complex configuration options, while DH students, although also reporting problematic

navigational journeys, tended to focus on item-level functionality to do with the page-turning and textual comparison functionality.

One way of interpreting these differing observations is to understand them as an expression of different but complementary expertise and subject interest in DH and library and information studies. On the whole, DH specialists are likely to be more concerned with what can be done at an item or collection level, see for example, the TEI Guidelines which is central to DH and focuses, for the most part, on item-level artefacts such as dictionaries etc. Conversely, librarians are more likely to be concerned about discovery at the cross-collection level (notwithstanding important DH work done at this level, the most obvious example being data mining). This perhaps reflects the current positioning of librarians as gatekeepers to large bodies of content — supporting discovery through information skills training and the provision of indexing/database content — rather than as embedded supporters of research through the lifecycle with an intimate involvement in the methodologies and technologies employed in academic departments. This expertise is both complemented and extended by what emerged as a central concern of DH scholars: their focus on the individual resources that support research, and shows how deep use of a smaller body of content, to the extent of utilizing innovative forms of retrieval, are as important as breadth availability of collections writ-large, using more traditional search and browse functions.

So, although this fits within the library provision of certain parts of the infrastructure framework (the general ability to structure collections and make them discoverable) the collection- or content-specific functionality requires close collaboration with domain experts and target users. Indeed, the insights that came about as a result of including digital humanists and scholars are ones that are unlikely to have been gained had librarians alone been consulted.

It is important to note that the project was initially conceived by the funders, who wished to transition the legacy of the Webbs into the digital age with the general aim of increasing and enhancing access. As a result, the collaboration and novel functionality explores innovative uses for the source material which could only be provided in a digital form, rather than targeting particular user groups with specific requirements. As we knew from physical user requests that access focussed on the typescript diaries - and that it would be relatively straightforward to provide a full-text search and images of that version - we focussed our innovation on the manuscripts, which are, generally speaking, more restrictive in the digital technologies which can be brought to bear. As a result, we were not serving a specific research interest, but looking to bring common techniques from the emerging field of DH to bear on content with the aim of increasing user interest in and engagement with digital collections within LSE Library. The common web analytic metrics of unique visitors and page hits, compared with physical access requests, showed that this general aim was met, although deeper analysis into

research carried out using this particular collection had not been completed at the time of writing (although it had for other digital collections within LSE Digital Library – which showed that subject- or technique-focussed scholars were using digitised collections in novel ways).

4.0 Collaboration with the commercial sector

A recent high-level report stated:

Our heritage and culture can reinforce Europe’s competitive edge in the era of the digital revolution and globalisation. Innovative business models, smart investments, collaboration between sectors (ie. public-private, cultural-business, creative-technological), policies adapted to the needs of stakeholders (ie. cultural institutions, creators, private partners, the general public) can help tackle the transition to the digital era in a dynamic and forward-looking way (European Union & Comité des Sages 2011, pp.44, S10.8)

In this section, we reflect on the public-private partnerships which contributed towards the delivery of the project. On the one hand, digitisation is an established practice with a mature market for services – hence the use of a commercial provider to convert the diaries to digital images and text was a simple procurement choice led by scale and cost-efficiency. While on the other hand the application of user experience techniques to digital cultural heritage remains embryonic – hence the use of a commercial provider in the broader context of designing LSE Digital Library forms part of a larger narrative about the changing role and required skills of the information professional. Public-private partnership at this frontier therefore reveals different aspects of collaboration which are relevant to both the librarian and the scholar.

The digitisation of the Webbs on the Web project was undertaken in parallel with a broader piece of work to produce an information architecture and visual design for LSE Digital Library, which included a significant amount of usability testing with a range of stakeholder groups, as described above. The core benefit of the public-private collaboration was that it enabled the Library to outsource skills in IA and visual design that complemented in-house skills in discovery and preservation.

Historically, we can see online discovery and digital preservation emerging as extensions of ‘traditional’ library skills in description and analogue preservation, in some ways they can be seen to represent an upskilling of, but not a radical departure from, existing practice. Web-scale information architecture and design skills meanwhile are less familiar,

both within organizations and professional curricula. These new areas of practice mark a striking feature of the changing circumstances of libraries—in online environments there is considerable competition for attention over other content providers such as publishers, broadcasters, and newspapers who work at significantly larger scales of content availability and use. For Library resources (or scholarly resources that are presented from a library environment) this creates high user expectations because a given audience is used to higher standards of presentation and functional precision across platforms and technologies than libraries are generally known for providing (Nielsen 2000)

This makes the development of usability and user experience (UX) roles in libraries a clear priority for the future, and one that to the authors' knowledge is rarely present in the modern academic library. Indeed it is in large part due to the success of this way of developing digital library services that the necessity of a permanent focus on user experience techniques and approaches within the library was recognised by the creation of a dedicated post in LSE library. **Despite organisations such as the HathiTrust recognising the importance of these approaches (HathiTrust n.d.) and the recent founding of the journal *WeaveUX* this focus is uncommon in academic libraries:**

To provide a compelling (or even a reasonable quality) user experience, libraries need to realign the business of how they approach systems development. Notably, there is no such person as a libUX professional in UK HE libraries. This needs to change. (van Harmelen 2011)

One clear benefit of the increasing availability of online resources is that functional iterations, the 'perpetual beta' are both expected and accepted. This lowers barriers to releasing new digital resources and allows best practices to emerge. However a clear sign of the relative immaturity of usability and UX practice is that libraries are good at collaborating on shared workflows (eg for cataloguing) but have come later to the game in collaborating on usability (cf Blacklight/VuFind for 'next-gen' library catalogue interfaces)

This also demonstrates the necessity of embedding skills within the organisational and service infrastructure of the library, as well as collaborating closely with disciplines such as DH, so that user insights are continually refined and momentum is not lost between projects. Equally, from the DH perspective, where, as we have discussed above, awareness of the necessity of usability testing is fragmented, libraries have an important role to play in communicating in an applied way the importance of such efforts. While specific requirements can perhaps be served by short-term projects, the broader questions of re-centering online library services around the user, driven by these techniques, and of re-

orienting the library professional away from collections and towards users, are best served by a design philosophy of continuous improvement.

In contrast to individual projects and/or resources, where specific functional development may be required to support research methodologies based on a format or collection, it is our contention that UX design approaches the greatest utility in value for money in being applied across collections—where the audience is broader than a specific group who may be willing to persist against the foibles of an interface due to an intimate need that only that resource may fulfil (due to the exclusivity of content or data model to support investigations of a certain type) but when thinking about long-term usability and developing audience engagement, efficiencies are developed in a digital library environment which make the investment in UX an easier case to make than at the individual resource level.

5.0 Collaboration between academic researchers and information professionals

In this section we will discuss some of the additional requirements and technologies that a DH project such as Webbs on the Web made on the digital library services and the collaboration with academics in the area of DH that were forged in order to respond to this.

The LSE Library Vision and Strategy states that we will “develop our digital library so we are able to acquire, preserve and provide access to digital collections” (Library Leadership Team, 2011). This requires certain baseline capacity in terms of staff skills and infrastructure to enable the acquisition and preservation of digital collections in format-agnostic ways (in digital preservation terms this means ensuring our ability to ingest content and preserve the bits). The ways in which we provide access to our digital collections are defined by the requirements of our user communities, and can range from very general (e.g. search a metadata record and display the returned images) to the very specific (such as the textual comparison we see in the Webbs on Web project). In cases where the functional requirements tend toward the more specific, and therefore the technical implementation more complex or domain-specific, the library must work with domain experts to capture requirements and carry out user testing to ensure that the resulting resource is fit for purpose. This tends to go beyond what the library can core-fund and so requires external funding sources, again as in the case of Webbs on the Web. Anecdotally it seems that this position is not unusual within the wider ecology of Academic Research libraries.

As mentioned above, the Webbs on the Web project was planned as a digital resource capable of supporting scholarly research and its requirements were anchored firmly in DH theory and practice. In order to make the text machine readable and thus support end-user

interactions with the textual content of the diary versions it was encoded in line with TEI. The Text Encoding Initiative (TEI) is the “*de facto* standard for literary computing” (Jannidis 2009, p.258). It is recommended by agencies such as NEH, AHRC and the EU’s Expert Advisory Group for Language engineering. TEI P5, the current iteration of the TEI Guidelines, “specify encoding methods for machine-readable texts, chiefly in the humanities, social sciences and linguistics” (TEI Consortium n.d.). As TEI offers advice and examples of how a given textual feature from any one of a number of domains may be encoded it draws on a wide range of contexts. For example, specific guidance is given on a range of text types and textual features from dictionaries (chapter 9), primary sources (chapter 11) and on Names, Dates, People and Places (chapter 13). At present, P5 comprises some 504 tags, having grown from 163 in the first edition of the Guidelines published in 1990 (Jannidis 2009 date p. 258).

In order to explore how TEI might best be applied to Webbs on the Web the project consulted with staff of UCL DIS and UCLDH. This collaboration was necessary because while members of the Digital Library team are familiar with the practice and theory of marking up texts in-house, expertise on the application of TEI to the literary research methodologies enabled by this project was not available. In addition to the transcriptions of the complete text it was specified that the following features would be appropriately encoded in TEI in order to make them machine readable:

- Dates which indicate the beginning of a new diary entry; dates which appear in the body of an entry should not be included
- Additions and corrections
- Handwritten additions which appear in the top-right-hand corner of each page;

It is necessary to distinguish sequential numbers which appear consistently from other additions which may or may not appear on each page (see examples below)

In collaboration a TEI schema capable of representing the desired textual features was agreed upon. This aspect of the Webbs on the Web collaboration emphasised how the skills of DH academics who specialize in topics such as TEI can be transferrable beyond the specific institutional environments that they work in and the specialized humanities artefacts they often address. It also points to how such collaborations between library staff and DH researchers can open a kind of virtuous circle, that benefits all involved, despite the extra resources and time required of them, and that is transferrable beyond the context of one particular project. While the library had to commit additional resources to this aspect of the

project so that the TEI encoding could be implemented and so that staff could attend meetings with UCL staff, they ultimately gained expert advice about how TEI (and other relevant metadata schemes) can be applied to its collections so as to better serve researchers. Similarly to the library staff the DH researcher needed to schedule additional time, in an already hectic schedule, for meeting with staff of the library and for advising on the implementation of the TEI encoding. Yet, they benefited immensely from being given the opportunity to see how focused interactions with specific sources, such as the Web diaries, fit into broader infrastructural and collection-level approaches to digital library development. This not only helps to inform the research of the particular academic and the teams that they work in but can also contribute to conversations and actions on curriculum design and the future directions of disciplines, particularly in terms of transdisciplinary and transinstitutional collaboration, as described above.

6.0 Conclusion

In this paper we have reflected on the kinds of collaborations and partnerships that underlined the development of a digital resource such as *Webbs on the Web*, which is at once a complex digital resource capable of supporting scholarly research and also fully integrated into the innovative platform that is being developed by LSE Digital Library in order to serve a wide variety of stakeholders.

We have reflected on the types of new knowledge that were created during the project, for example, the unique but complementary perspectives on the *Webbs on the Web* project that were identified through the inclusion of both DH and Information Professionals in user testing. So too it has been argued that the kinds of collaborations that took place in this project reflect broader changes in academic communities and digital library development and that a host of mutually beneficial outcomes can be pursued through them. The *Webbs on the Web* project brought together a partnership of funders, library, and domain experts working together to develop a digital scholarly resource. Where LSE Library brought a core understanding of the infrastructure and skills needed to support long-term sustainability, domain experts from UCLDIS brought use cases for library collections (existing and to-be-digitised, or to-be-deposited once created) and research methodologies or technologies, and funders provided capacity for the addition of content and/or implementation of functionality to augment core preservation and dissemination infrastructure.

We conclude that greater awareness of synergies of skills from library and DH perspectives is necessary in order to make resources suitable not only for the widest possible audience (in making 'traditional' discovery/retrieval functionality available) but also for more detailed and forward-looking methodologies such as those used by researchers in specific fields—shown through the unique but complementary perspectives that each of these groups seized on during user testing. The benefits of the project were not only to the end users but by incorporating students we gave them insight into and experience of development methodologies and the bridging of academic and curatorial concerns. In this way our article presents a range of examples of kinds of breaking down of boundaries and hierarchies that is possible in a world where there is greater connections between the academic library and DH and the benefits that can flow from this.

In this paper we have focused on an individual case study, *Webbs on the Web*. Nevertheless, we recognise academic libraries must serve the digital needs of all researchers and that these will include those from the Sciences and Humanities and many other areas. Furthermore, as research tends ever more towards interdisciplinarity and collaborative working practices, and digital resources offer access to materials that might otherwise be unavailable to certain groups, it is difficult, if not unwise, to conceptualise digital projects with only particular groups in mind. As in the case of this project, it was essential that the online resource be embedded within the broader context of an integrated (yet emerging) digital collections strategy of LSE Library. This manifested in the provision of the resource through the infrastructure of LSE Digital Library – thereby also providing generic, cross-collection support and services for discovery and reuse. A key architectural principle has been to layer content- and collection-specific functionality such that certain baselines of discovery and interaction are available across all locally-published digital collections, with more targeted functionality - which may be provided only for a subset of content - available only when it is relevant, and provided for use in ways which do not interfere with the generic functionality nor create silos of content where cross-navigation to the broader set of collections is prevented in favour of serving only particular groups with very specific functionality. In this way, the specific requirements of particular groups can be balanced with those of other users to the detriment of neither – the specific functionality is available when required for those who are looking for it (or who have been introduced to it and up-skilled in using it) but fading into the background when more generic requirements will serve the needs of a different audience. In this way, multi-faceted user needs can be considered when designing rich user interactions with digital content.

It is for this reason that we conclude by listing some of the core lessons that we learnt from this project. We hope that by presenting such lessons in the general way that we have below that they may speak to a wide cross-section of the DH and Library community. The main lessons that we have learnt are based on the issue that the type of collaboration described here is one that is not common in either the traditional library or academic setting. Participating in such a collaboration is time-consuming, difficult, interesting, challenging (in the best sense of the word) and a learning experience for all involved because we brought with us little prior training in, or experience of, such cross-institutional collaborations. Therefore, we submit that:

- (i) It is becoming increasingly necessary that both library professionals and academic researchers should receive more training in collaborative and trans-institutional working practices**
- (ii) More projects and collaborative working teams should document their experiences and make them publicly available, even if the outcome of a given project is not a wholly positive one. Not only does this open the possibility of inspiring further projects but it may also allow us to begin to approach (and study) such partnerships in a more systematic way.**
- (iii) The kind of collaboration described here takes time to develop because it is not one that is rooted in traditional library or academic experience. It is important to have realistic expectations about what can be achieved via such a collaboration. It is also important to have ambitious expectations.**
- (iv) With such collaborations one is, to some extent, playing a long game. The kinds of mutually beneficial outcomes that emanated from this project and that are described above were not clear and perhaps not, in terms of their specifics, even predictable at the outset. Therefore it is essential to approach such collaborations with a somewhat playful attitude as well as a good deal of patience.**

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