

TITLE: Using collections and worksets in large-scale corpora: Preliminary findings from the Workset Creation for Scholarly Analysis project

ABSTRACT

Scholars from numerous disciplines rely on collections of texts to support research activities. On this diverse and interdisciplinary frontier of digital scholarship, libraries and information institutions must 1) prepare to support research using large collections of digitized texts and 2) understand the different methods of analysis being applied to the collections of digitized text across disciplines. The HathiTrust Research Center's Workset Creation for Scholarly Analysis (WCSA) project conducted a series of focus groups and interviews to analyze and understand the scholarly practices of researchers that use large-scale, digital text corpora. This poster presents preliminary findings from that study, which offer early insights into user requirements for scholarly research with textual corpora.

INTRODUCTION

Scholars rely on collections of texts to support research activities across numerous disciplines, ranging from physics and public health to English and computer science (Underwood, 2013; Argamon, et al., 2009; Heuser & Le-Khac, 2012; Moretti, 2009; Petersen et al., 2012). To answer research questions about topics ranging from literary form to language and culture, humanities researchers may work with large numbers of complete volumes or smaller, hand-selected sets. While some researchers analyze the base texts, others work with derived features. Libraries and information institutions must prepare to support research using large collections of digitized texts, and need to understand the different methods of analysis applied to the collections of digitized texts across disciplines. The HathiTrust Research Center's Workset Creation for Scholarly Analysis: Prototyping Project (WCSA) conducted a series of focus groups and interviews to understand the scholarly practices of researchers using large-scale, digitized text corpora.

The HathiTrust Research Center (HTRC)¹ is the research branch of the HathiTrust (HT),² a repository of over 10 million volumes (3 billion pages) of text. HTRC offers a suite of tools and services, which enable computational access to the HT corpus. From digitized library collections in HT, scholars select subsets for computational analysis according to their particular research objectives. We refer to these subsets, along with associated, external data sources, as "worksets". Worksets are a type of machine-actionable, referential research collection. User requirements for workset creation grow increasingly sophisticated and complex as humanities scholarship becomes more interdisciplinary and more digital over time.

¹ <http://www.hathitrust.org/htrc/>

² <http://www.hathitrust.org/>

HTRC holds transformative promise for humanities scholarship: enabling scholars to sift through a massive corpus and, therefrom, to construct precise worksets required for investigation. How scholars use collections and worksets remains a central research problem in this initiative. Under the auspices of the HTRC, the WCSA team conducted a series of focus groups and interviews investigating how to facilitate scholarly selection of digital research materials.

WCSA is a two-year effort, funded by the Andrew W. Mellon Foundation, which aims to engage scholars in designing tools for exploration, location, and analytic grouping of materials so they can routinely conduct computational scholarship. The three major goals of the WCSA project are to 1) enrich the metadata in the HT corpus, 2) improve access and discovery through referenceable metadata, and 3) formalize the notion of collections and worksets in the context of the HTRC. This study gathers qualitative data on scholarly practices with text corpora to inform the development of tools and services for HTRC.

BACKGROUND

The use of digitized, primary source materials is growing in value and prominence among humanities scholars (Brogan, 2006; Palmer, 2005). In addition, the act of bringing together related information from various kinds of collections is essential to their research processes (Warwick, et al., 2008; Sukovic, 2008; Sukovic, 2011). In the course of their work, researchers create their own “digital aggregations of primary sources and related materials that support research on a theme” (Palmer, 2004). In certain domains, scholars create personal, digital carrels, gathering subsets of texts amenable to in-depth analysis using advanced tools and services (Mueller, 2010). Research collections comprise a variety of media and formats, which together function as a coherent collection of interwoven content and context (Brockman, 2001).

Scholars also play a critical role in shaping how librarians and information scientists formalize collections to support research activities. A 2010 Council on Library and Information Resources (CLIR) report warned:

While a greater reliance and dependency on digital resources is inevitable, the quality of the data and their organization and accessibility in service to teaching and scholarship are major concerns. Without the guiding voice of scholars, the tremendous effort now being devoted to digitizing our cultural heritage could in fact impede, not facilitate, future research. (CLIR, 2010)

In 2011, the Center for Informatics Research in Science and Scholarship surveyed digital humanities scholars granted Google Digital Humanities Awards who were given large-scale text corpora from Google Books for their research projects. Among the major challenges and areas of need identified in the study’s findings were 1) identifying and retrieving materials and 2) identifying characteristics of textual content. The authors noted:

Researchers do not necessarily need huge sets of data to do interesting work, but the implication is that they do need flexible data delivery services that can deliver different kinds of data in different formats based on different searches for different kinds of research at different times. (Varvel & Thomer, 2011)

Developing such flexible services requires ongoing inquiry into the research practices of specific disciplines working with these sources, including investigation into the types of research questions posed by scholars and the types of analytical methods employed.

METHODS

This study addresses the research question: How do researchers, especially humanities scholars, use collections in the course of their research, particularly in the context of textual corpora? The WCSA team collected data through semi-structured focus groups and interviews, which targeted researchers in the humanities and others working with digital collections.

Participants were asked about how they identify, select, and obtain access to texts for inclusion in analysis; transformation and pre-processing steps; units of analysis (works, manifestations, pages, n-grams OCR, images, etc.); methods of analysis; problems encountered in obtaining text corpora and materials not currently existing in digital form; and challenges to working with these digital collections (e.g., OCR quality, duplication).

Focus groups and interviews were conducted at the Digital Humanities 2013 conference, the 2013 Joint Conference on Digital Libraries, and the 2013 HTRC UnCamp. Thirteen individuals participated in the focus groups and five scholars were interviewed, for a total of eighteen participants in the study thus far.

Focus group and interview recordings were transcribed, and transcriptions are being manually coded to identify emergent themes. Each transcription is coded multiple times to ensure inter-coder reliability. Further content analysis is ongoing.

PRELIMINARY RESULTS AND DISCUSSION

Participants included junior and senior faculty at liberal arts colleges and universities, computer programmers, librarians, data scientists, academic technologists, and graduate students. Scholars were specialists in English literature, classics, linguistics, library and information science, and history. Participants were affiliated with academic institutions located around the world, including Great Britain, Singapore, Germany, France, and different regions of the United States.

A set of key themes have emerged from preliminary analysis. The following three examples illustrate the roles of collections; the need to implement granular, actionable units of analysis; and the importance of expert-enriched, shareable metadata.

1) Researchers consider the processes of collecting and workset-building to be basic scholarly activities. Researchers collect on the bases of diverse criteria, but aim for exhaustiveness within defined analytic constraints: for example, complete representation of a genre over some period of time, complete representation of the works by a demographic, or a complete lexicon of some language, in print, for a certain time period (Figure 1).

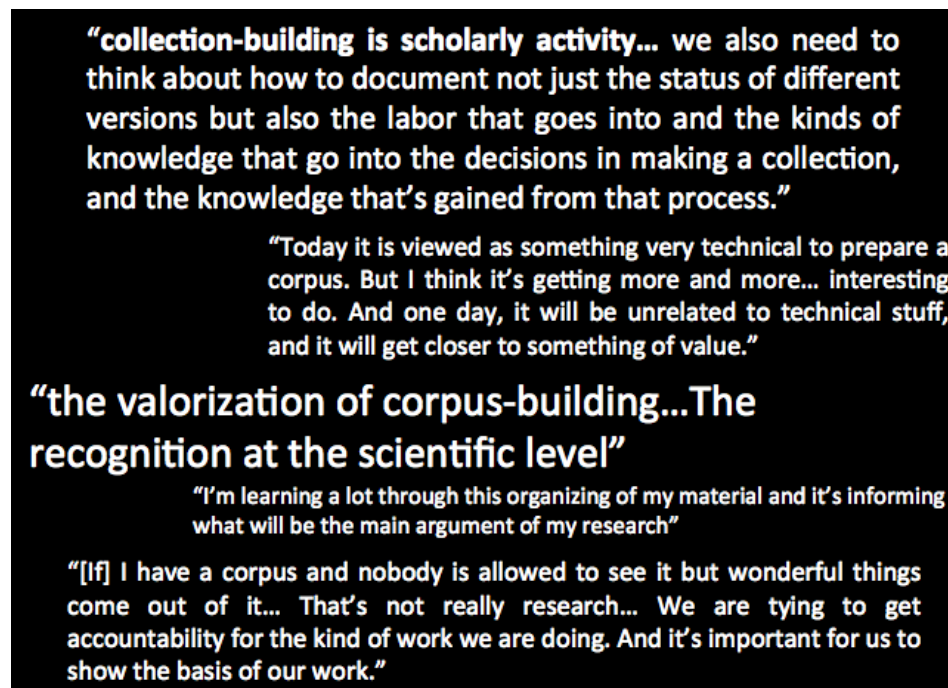


Figure 1. Selected focus group and interview excerpts on collection- and workset-building.

2) Researchers desire that collections, worksets, texts, and other objects of analysis be highly divisible, and that resultant pieces be identifiable, movable, and readily associable with highly granular metadata--what Mueller calls “re-diggable and multiply recombinable data” (Mueller, 2012). Participants described a range of targets for analysis: full authorial oeuvres, individual novels, pages and page images, word tokens, parts-of-speech trigrams, poems within books, notions or themes, characters, encoded TEI elements, lexicons, and more. They want to move subsets of worksets, or different logical or syntactic pieces of their data, between tools, collections, processes, formats, and standards, and track them throughout (Figure 2).

“...we need ways to slice this book. So we need to slice it by page...We need to slice it by poem, which doesn’t conveniently overlap or match the page boundaries. We potentially need to slice it by sections within a poem...”

“they use a lot of corpus configurations, like **subcorpora**. **Subcorpus** building... And partitions-building. Partition is to slice the corpus in parts, the sum of which is the whole. So this is for contrastive analysis”

“Books are often not interesting without knowledge of the **logical works or units within...**”

“that’s a whole different dicing intellectually ... Being able to support the huge variety of those kinds of ways of thinking about [texts] at that logical level is a bit challenging. But I think it’s one that somehow has to be approached...”

“We have words, text units, and intermediate structure. Those three levels hold different types of properties”

Figure 2. Selected focus group and interview excerpts on divisibility and objects of analysis.

3) Researchers critically need more and better metadata, beyond conventional bibliographic metadata, for multiple aspects of the scholarly research process—from precise retrieval of texts to defining units of analysis. Participants noted a common desire to share their expert-created or -enriched metadata more broadly, much as they would disseminate results of analytic work. Participants also expressed interest in collaborative, curatorial work on texts themselves (such as to edit, encode, or enrich the outputs of digitization).

“The book is not a unit of great interest – you want all the poems that aren’t listed in the metadata. The **metadata from the library is very coarse**, especially in respect to the goal you have. There’s no opportunity for the experts to provide **the deep metadata to share in the broad infrastructure** that librarians do very well.”

“Collaborative curation... You could create the data collaboratively, and then explore them collaboratively”

“one thing is getting the data out. But then the next step is, you’ve done all this work, and you then have the authoritative metadata. **You have the best metadata in the world, and no one will take that from you.** Because it has not been blessed.”

“it would be very important to have the ability to say [of the metadata], this is wrong ...having a workflow which supports that would be important. So the whole idea of **social addition** comes really into play here.

Figure 3. Selected focus group and interview excerpts on metadata enrichment and sharing.

CONCLUSION

Based on preliminary analysis, participants' responses indicate the need for formalized workset protocols that allow scholars to identify, select, and pull together subsets of texts within massive corpora. Ongoing data analysis will inform development of tools and services for HTRC, and best practices for other large-scale corpora. The study of user requirements for digital collections is critical to meeting the needs for rising levels of scholarly research with digital materials.

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