Panel: The Architectural Touch: Gestural Approaches to Library Search

Andreas Kratky
University of Southern California

Virginia Kuhn
University of Southern California

Susan Luftschein
University of Southern California

Michaela Ullmann
University of Southern California

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Panel: The Architectural Touch: Gestural Approaches to Library Search

**Session Type**
90-minute panel session

**Abstract**
This panel centers on the *LibViz* project—a touch and gesture-based interface that allows users to navigate through library collections using visual queries—and the issues surrounding such efforts. The *LibViz* project, for which we have done initial research and constructed a prototype, aims to increase the discoverability of library materials, particularly those of non-textual objects, which are difficult to access via traditional search and which do not circulate. Many collections are currently preparing large scale digitizing of three-dimensional objects and it is imperative to develop appropriate methods to work with this new kind of data. The established methods only do a poor job at providing access to 3D-object data.

Based in theories of "grounded cognition," the *LibViz* interface will be optimized for use on personal mobile devices, but it can also be used on large format touch screens equipped with depth cameras that track user gestures. In other words, the interactive flow of *LibViz* allows both gestural interaction and touch commands, effectively extending the sensory modalities involved in the cognitive processing of the search results.

By engaging a fuller range of human cognitive capabilities, the *LibViz* interface also hopes to help transform search. The amount of data generated in the digital era is growing exponentially, and so we must find novel ways of analyzing and interpreting these vast data archives. Moreover, the ways in which information is categorized and databases are created are value laden. As such, the processes by which these structures are established should be more transparent than conventional systems currently allow. The project turns library search into a powerful and pleasurable experience, stimulating engagement with the collections and the library itself.

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The Architectural Touch: Gestural Approaches to Library Search.
Bridging the Gap - Physical Materials in Special Collections and the
Need for Innovative Engagement and Search Tools
Presented at the 2015 Digital Initiatives Symposium
April 29, 2015
University of San Diego

Michaela Ullmann, Exile Studies Librarian, University of Southern California Libraries
Abstract

This paper explores the challenges Special Collections librarians are facing in connecting users with their collections, and in bridging the gap between their rare, valuable, attention-grabbing, and unique materials and the often uninviting, inaccessible-looking, and highly secure spaces of Special Collections departments. Utilizing post-instruction assessment outcomes, research on the search behavior of millennials, and an environmental scan of newly developed engagement tools for museums and libraries, the paper aims at underlining the need for LibViz, a tool developed by library and cinema faculty at the University of Southern California, that aims at turning library search into a powerful and pleasurable experience, stimulating engagement with and discovery of Special Collections materials and the library itself.
The Architectural Touch: Gestural Approaches to Library Search.

Bridging the Gap - Physical Materials in Special Collections and the Need for Innovative Engagement and Search Tools

The recent development of a number of new tools and the increase of Digital Humanities initiatives underline the disconnection between the unique and highly engaging holdings of libraries’ Special Collections and museums’ holdings, and their potential audiences. This paper explores the challenges Special Collections departments are facing in connecting their collections with users, the changed search behavior of users, particularly millennials, and the need for new technologies that allow reaching audiences beyond the physical restrictions of a library or museum. Faculty at the USC Libraries and USC’s School of Cinematic Arts came together to develop LibViz, a tool that addresses these challenges and aims at turning library search into a powerful and pleasurable experience, stimulating engagement with and discovery of libraries’ treasures housed in Special Collections, and the library itself.

Challenges in Connecting Users to Special Collections’ Materials

One of the greatest challenges Special Collections librarians face today is bridging the gap between users who are increasingly used to accessing information in a digital environment and the actual artifacts in our collections. We know from experience and assessment conducted during instruction and outreach in Special Collections that once students and patrons see a physical artifact or rare book in front of them, they usually quickly engage with the materials. They are impressed by and get excited about an artifact’s age, its value, its historical relevance, its material, or its overall significance.

It is not so much our problem to engage our users with the materials once they are in front of them. It is our problem to get our potential users in front of the materials.

In addition, Special Collections departments are struggling to overcome the challenge of fostering discovery and engagement with their rare, valuable, attention-grabbing, and unique materials while their spaces are uninviting, inaccessible-looking, and highly secure. Students, particularly undergraduate students, are often intimidated by Special Collections, assuming they are only accessible for the more mature researcher. Tools to engage users with Special Collections outside of the limitations of the physical space are needed.

Currently, these challenges are met through events and proactively reaching out to our potential user community. Just as other Special Collections librarians, staff at USC Libraries’ Special Collections curate exhibits, host events in which materials from the collections are featured and the audience is invited to engage with them, and use Social Media such as Twitter and Facebook to promote our collections and services more broadly. In the instruction arena, the instructional design was switched to adding more hands-on activities and by creating quizzes aimed at increasing the interaction and the engagement with materials. Yet creating events and building new relationships with teaching faculty is staff and time-intensive and requires thorough and constant engagement from librarians and archivists. Even if a department does an outstanding job in creating outreach activities, a considerable part of the potential audience is still not targeted and thus reached.

Throughout 2014, staff at USC’s department of Special Collections conducted post-
instruction assessment, asking students in a broad variety of class visits to Special Collections about the top two things they learned about the USC Libraries’ Special Collections during the visit. From the 88 responses received, the majority referred to the fact that students were not aware of Special Collections’ existence before, and they did not know about its accessibility to students and the wide range of materials represented in the collections. In addition, many students pointed out an artifact or materials that they were particularly impressed with. The outcomes from the assessment are particularly interesting for the LibViz project as they indicate what students are most engaged with during a class visit, and what the greatest takeaways are for them. The results gathered provide guidance for outcomes the LibViz project aims to achieve.

A tool is needed that can recreate the engagement and that can transport the information about accessibility and individual, attention-grabbing collections and items, but without the limitations of the physical space and staffing requirements.

Addressing the Ways Our Users Search

While virtual exhibits, Social Media, and Digital Libraries are effective tools in creating engagement with and access to Special Collections materials outside the physical spaces, there is and remains an urgent need to develop more sophisticated tools that are geared to address the way current and future generations of users can discover and explore special collections materials.

Over the past years, we have seen an increased development of tools that aim at bringing together the physical and the virtual, yet most of these tools focus on representation of materials and on engagement but show no or very little re-envisioning of the search process. A new tool however should not only focus on the way we rethink the representation of our materials in the virtual environment. It more importantly has to address the ways students and patrons search for materials today and in the future.

When a student browses the library’s catalog today and comes across the record for a Book of Hours from the 1300s, what the student would see is a catalog record that provides a title, publication info, physical description, general notes that add more descriptive information, the language the book is written in, some provenance information, and hopefully descriptive information on the binding. If the student is not specifically conducting research on Books of Hours or related subjects and maybe just came across the record accidentally, the student will not be particularly curious to see the actual book, based on the matter-of-factly way the book is described in the record and the record lacking any kind of visual representation. When students however are given the opportunity to engage with the physical object during a class visit or in the Rare Books reading room, they are able to see that the same book is illuminated in bright colors and gold leaf, that its binding is made from leather, and that its pages are made from vellum. They observe the quality of the hand-painted miniatures in the book, and recognize the details of the ornaments tooled into the leather. They can even pick the book up, turn it around and look at all its sides, and feel its weight. The physical interaction creates a high engagement factor and makes the book more accessible and concrete which contributes to making a future use of Special Collections materials more likely as evidenced in the post-instruction assessment mentioned earlier.

An important task for the LibViz project therefore is to design an interface that reflects the ways current and future generations search. Research shows that millennials are used to
search engines such as Google that provide information at their fingertips. Although they understand that Google may not provide the quality information a library catalog can, they expect a library catalog to be similarly intuitive. A case study by Brandi Porter (2011) shows that millennials often expect search boxes, similar to a Google’s interface. Porter’s (2011) findings included that millennials use natural language in their search and spend very little time developing search strategies or search terms, and that they often chose the first result from a result list, making clicking the first link a common practice in their searching.

Environmental Scan

With the rise of digital humanities initiatives, the number of tools developed to provide information visualization has increased. Examples are digital libraries as well as tools that support the work of cultural heritage institutions in their efforts to share data, dynamically visualize their collections, as well as the access and discovery of materials in those collections.

In order to further develop Lib Viz, an environmental scan of platforms recently designed to support the work of cultural heritage institutions in their efforts to share data, dynamically visualize their collections, and access and discover items was conducted. Among these platforms was the Beta version of Smithsonian X 3D, featuring a set of use cases applying various 3D capture methods to select objects. The Smithsonian aims to use the Smithsonian X3D to showcase a larger number of the artifacts in their collections since currently, only about one percent of their 137 million objects, artworks, and specimen is on display in its museum galleries due to the limitations of physical space (“About Smithsonian X 3D”, n.d.). In collaboration with Autodesk, the Smithsonian developed the Smithsonian X 3D Explorer which contains tools that allow the user to examine the objects by rotating them and taking accurate measurements. The Explorer furthermore allows curators and educators to create guides to the collections and to feature their items on social media.

Amar Hanspal, senior vice president at Autodesk stated:
We hope that exploring these priceless artifacts, heirlooms, fossils and scientific specimens in 3-D will generate more public interest and learning around science and technology — especially among students. (Smithsonian unveils online 3-D viewer, 2013)

Another platform the Lib Viz team looked at in their environmental scan is the Bohemian Bookshelf, developed by the Innovations in Visualization Laboratory at the University of Calgary (Inno Vis). Bohemian Bookshelf is a digital book discovery visualization software that provides visualizations of different perspectives on the book collection thus offering multiple access points and serendipitous discoveries. Although an online version is available, Bohemian Bookshelf was also installed on a touch table in a high-traffic area of the library, providing a physical presence for special collections materials and providing a mechanism to attract wider public interest to a collection that otherwise is known only by specialist researchers (Berstler, Erdmann, Brosz, Sadler, Hardy, Wust, & Bernhardt, 2014).

Library Explorer is a beta application developed by Brown University and the Harvard Library, built to facilitate discovery of the Library's digital collections and to allow patrons to interact with these collections in new ways. Library Explorer was installed on three touch tables, allowing for experimenting with gesture-based technologies in library settings. The scarcity of affordable and library-specific commercial software greatly limited the functionality of the tables in the three libraries where they were deployed, but the tables' horizontal surface and ability to support both multiple touches and multiple users made them very popular with students, staff
and faculty (Berstler et al., 2014).

According to Berstler et al.: 
A key observation made by the project team was that table users exhibited a strong desire to interact with objects and to annotate and share content between the tables and other devices. The experience at Harvard also demonstrated the potential of these new technologies to enhance the discovery of library collections (2014).

In going forward, the LibViz team will further investigate the lessons learned and challenges faced by the projects in our environmental scan as well as others.

Conclusion

By designing an interface that allows users to discover, sample, and engage with materials in Special Collections without the restraints of the physical space, and by making the search process more visual and tangible, LibViz aims at bringing the libraries’ holdings closer to a younger audience and at recreating the high engagement factor students experience in class visits to Special Collections, as well as the serendipity they would usually only experience by walking among the book stacks.
THE ARCHITECTURAL TOUCH: BRIDGING THE GAP

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The Architectural Touch: Gestural Approaches to Library Search. LibViz - A Research Framework for Object Representation and Search in Heterogeneous Object Collections

Presented at the 2015 Digital Initiatives Symposium
April 29, 2015
University of San Diego

Andreas Kratky, Assistant Professor, Interactive Media and Games Division and Media Ars and Practice Division, School of Cinematic Arts, University of Southern California
Abstract

The LibViz project is a research framework tackling the multiple levels of challenges faced by the heterogeneous object collections characteristic for special collections departments. It aims to assess what is needed for this type of collection to thrive in a coming digital infrastructure of industry-scale object digitization. Starting with a comprehensive analysis the project will formulate methods and technologies to inform how this coming digital infrastructure can and should be implemented. The project team is interdisciplinary, joining the expertise of specialists in library science, preservation and literacy as well as computer science and human computer interaction. This paper gives an overview over the structure of the LibViz project and its philosophical and conceptual strategies.
Introduction

The *LibViz* project is a conceptual framework to research questions of object representation and search in heterogeneous object collections. It is designed to help to improve discoverability and access, and to reshape the search process as a pleasurable and serendipitous activity. We recognize that the challenges that special collections are facing are unique and present a compounded version of the challenges other collections with less heterogeneous holdings are facing. *LibViz* aims to approach these challenges as an integrated complex spanning multiple disciplines. While many library collections have benefitted from the digitizing efforts underway since the last fifteen years and increased their possibilities of access, object collections have been suffering an increasing lack of discoverability. In particular special collections departments with their heterogeneous collections of primary source materials have been fading from the surface of easily discoverable and routinely accessed resources. *LibViz* aims to change this with an approach rooted in a philosophy of medium-specific representation and search tools. With a broadly interdisciplinary team joining the expertise of specialists in library science, preservation and literacy as well as computer science and human computer interaction we are aiming to develop a methodology and infrastructure of object representation and search tools that is able to communicate the specific qualities of a wide range of tangible objects with different value attributions, answering to a broad spectrum of research questions.

The awareness of the value of object collections in the humanities as a way to better understand our society and culture and to pose new questions to our cultural heritage is firmly established. The *material turn* (Bennett & Joyce, 2010), (Clever & Ruberg, 2014) has brought many disciplines from history to cultural studies, from sociology to gender studies to look at material objects as their focus of study. Inquiries directed to objects have multiplied and lead to many new insights but still the accessibility of the collections housing those objects leaves much to desire and is getting more difficult rather than easier. Since the late 1990s many libraries have engaged in large scale digitizing of text holdings and empowered researchers to access abundant resources worldwide (Chepesiuk 1997). This effort has not only changed the nature and role of the library, also the ways we conduct research have been fundamentally transformed. The role of the library as the locus of information and the place to go to for research has diminished as large parts of the information that was formerly accessed there is circulating online. People are more and more used to online resources for many good reasons, such speed, convenience and the global linkage of databases, enabling researchers to search collections all around the world rather than only what they happen to have in their local library.

The focus on digital information and online networks has made it easy for holdings that can be digitized to circulate more widely than ever before – while in parallel holdings that cannot easily be digitized or made accessible through search engines are fading from access and circulation. It was not a big effort for a scholar who was conducting research in a library to pay a visit to the special collections and include objects from their holdings into her study – now this step is getting more and more difficult. Tangible objects pose a particular problem because it is still very difficult and labor intense to digitize them and we have no standardized methods to generate object specific meta-data for them, to effectively search for them and to represent them in adequate ways. These are all active areas of research and the progress in 3d-scanning in the last five years has been so fast that it can be expected that soon large scale object digitizing projects will begin. A prototype of the high-speed industrial-scale digitizing platform *CultLab3D*, developed by the Fraunhofer Institute in Germany, has been tested scanning
sculptures from the collection of the Liebieghaus Museum in Frankfurt and the Museum of Natural History in Berlin, Germany (Press Release n.d.). Research in these areas has been focused on specific domains such as 3d metadata for architecture or for archaeology, scanning of art-historic objects or science objects and institutionally overarching standards have not yet been established.

The LibViz project intervenes in this situation as an effort to investigate the complex consisting of the representation of the heterogeneous collections typical for the holdings of special collections, the formulation of metadata and the development of appropriate search methods for this specific class of objects. The contribution of LibViz is to analyze the specific needs of this kind of collection and develop methods and standards that will make special collections holdings perceivable and accessible in the digital infrastructure of future information seeking. The solutions developed in the context of the LibViz project will directly benefit special collections but they will also be a contribution to the work with heterogeneous object collections in general. The differences separating the library collections from special collections exists in similar ways in many other institutions. An example could be the distinction between the holdings of natural science, the taxidermies etc. in a natural history museum and the collection of documents such as the reports, diaries and tools of the explorers themselves in the science-historic department of the same museum.

The Special Case of Special Collections

Special Collections are a particular case compared to other library collections as they typically have a very wide range of different items. The special collections of the University of Southern California, the collection the LibViz project will work with as a test bed, contain rare books, artist books, images, audio documents, costumes, tools, stereo-slides and many other objects that cannot easily be represented by one consistent form of value attribution and representation. While library holdings generally are valuable for their textual content, the way special collections items are valuable to scholars vary (Rinaldo 2007). Rare books may be important for marginalia that can be found in them or for the special printing or binding techniques. Artist books may be important for their art historic value of their sculptural or dynamic properties or they may be viewed for how they embody discursive processes like a particular way of unfolding or of recombining their component parts in the process of viewing the item. The varied qualities of special collections items make them particularly interesting for humanities research, but they are currently underrepresented in the discourse about 3d-digitizing, which is mostly targeting objects of art historic, archaeological or scientific value. Representing these varied qualities in reference systems either specifically tailored for textual information, as in the case of library collections, or for systems with more or less uniform value attribution, as in the case of e.g. art collections, is not easy and tends to not adequately represent the specific values of special collections objects. The LibViz project is investigating different forms of representation ranging from 3d scanning to surface relighting, filmic representation and stop motion animation in order to find appropriate ways of representation and ways of standardizing them. These forms of representation are currently non-existent in the research about digitizing object holdings and the results of the LibViz project will be an important contribution to extending the ways object collections are treated.
Special collections have to solely rely on search tools in order to make their holdings discoverable and accessible. The items do not circulate because of the special safety and security measures they have to be subjected to. And while other object collections can showcase their objects in exhibitions, special collections are normally mostly hidden in vaults. Surveys done post-instruction and at the occasion of special outreach events at USC have shown that patrons engage with quickly with the collection objects once they encounter them and are impressed by their qualities such as age, aesthetic value or rarity. But most patrons are not aware of the special collections holdings and would rarely seek to find them. This is due to the fact that the objects are locked up in the, but it also has to do with the way they are currently referenced in the general library catalogue. From the text entries in the database it is very hard to evaluate if an object has potential value for a specific research question if the patron is not already familiar with the object. For images and archival documents the digitizing efforts have helped to increase accessibility even though search still has to rely on text entry and keywords. A similar effort and combined search across the various parts of the collections would be of tremendous help.

Rethinking Library Search

The LibViz project is conceived based on the notion that the issues special collections are facing and the challenges to formulate appropriate search methodologies for the coming digital infrastructures of object digitizing have to be tackled as an integrated complex of object representation, metadata creation, search methods and search interface design. One standard form of representation will not be sufficient to adequately communicate the qualities of objects with widely differing natures. We are looking therefore to extend the current forms of 3d digitizing, introducing methods of capturing textural structures of object surfaces and their dynamic process qualities such as the pragmatics of opening or unfolding of hidden layers of objects. These methods of object acquisition will be examined in their abilities to automatically generate certain metadata describing for example surface and material properties, size and volumetric aspects.

Linked to the investigation of the kind of metadata that can cater to the many ways in which the objects can be valuable for researchers is the question of search methods exploiting the new forms of object representation and metadata introduced by LibViz. Only with a flexible and open search approach combining multiple forms of metadata and search strategies this can be achieved. We are looking toward the renewed interest in serendipitous search as an inspiration for the implementation of our notion of flexibility and openness. Aiming for serendipity is still an uncommon concept in the philosophy of library search, which is generally designed to establish control and precision rather than elements of the accidental and unexpected. The assumption is that patrons will find a search tool effective and precise when it brings them straight to the item they are looking for. This means the aim is to eliminate unexpected and tangentially related results from the search process. Recent studies about serendipity in the search process, though, have revealed that "serendipitous events were not just good; they were seen as extremely exciting and positive, as highlights in the information seeking […] activity." (McBirnie 2008)

A romantic notion of the experience of serendipity is paradigmatically embodied in the account of Gotthold Ephraim Lessing's meanderings through the library of Wolfenbüttel. After his arrival in 1770 Lessing engaged in long serendipitous wanderings throughout the library
stacks with his mind open for the forgotten and unexpected works that might turn out to be "the winner" for him. With a penchant for gambling, Lessing conducted his walks through the stacks indeed like a game of chance and is still praised for the findings of exceptional works he made (Krajewski 2011). The stroll through the library that reveals unknown treasures of knowledge harkens back to the desire for adventure and for surprise by new thoughts and connections that were not thought of before. This notion of serendipity, which is directly linked to the physical engagement of walking and proprioception, of way-finding and the physical exploration of tangibly existing objects, seems somewhat arcane from today's information technology perspective, but nevertheless there is value in revisiting it. While serendipity was not at the heart of library search after those early days of library science, until in the last ten years it has gotten renewed attention as a promising tool. This interest was probably fueled by the interest in computer science and information processing, where pioneers like Vannevar Bush, Ted Nelson and Douglas Engelbart tried to make serendipity an integral part of how we interact with computers. The idea again was to spark new ideas through unexpected connections and to enable "unsought findings" (Andel 1994). Even though there seems to be a paradox between accidental findings and a precise and controlled information environment several studies have since indicated how it might be possible to foster serendipity and how it can be useful for library search (Edward Foster & Ellis, 2014; Foster & Ford, 2003; Makri, Blandford, Woods, Sharples, & Maxwell, 2014).

Digital technologies have made abundantly more serendipity possible through the connected databases of the Internet and the technologies that visions like hypertext, the "Project Xanadu" and others have provided us with. The potential for serendipity is far greater than our abilities to actually benefit from it. Serendipity requires the mind to be open for a new finding and recognize it as an information that leads to new thinking and knowledge. This openness is far less likely to occur when the information seeker is stressed by too much information to process and struggles to maintain a narrow focus of attention (McBirnie 2008). In this respect Lessing's library wanderings had a beneficial aspect, he could only proceed in his search from topic to topic and from area to area at the pace of his walking and the scanning of new information was only as fast as his gaze moved over the rows of books. There are two valuable aspects inherent to this early scene of information seeking. The first is the speed and the sense of leisure and pleasure inherent to the stroll that makes information seeking an enriching and enjoyable experience; the second is the possibility to use all of his body, his skills in navigation and orientation, his process memory, proprioception and muscle memory to support the processing of the information he encountered.

Enhancing Cognitive Processing

The LibViz project uses aspects of physical motion and visual perception to support the cognitive processing of search results and to classify information that is encountered in library search. This approach is in holding with theories of grounded and embodied cognition formulated in cognitive science. The traditional view considered that knowledge resides in the brain as abstract semantic memory, and it regarded the body and its physical functions of perception, action and introspection as peripheral in the processing of cognitive tasks (Barsalou 2008). This view is one of the reasons why current search tools focus solely on textual semantic systems. In the last fifteen years a growing number of empirical studies in cognitive science have
been undertaken focusing on the role of the body and perceptual modalities as important parts of knowledge representations in memory (Barsalou 2009; Varela, Thompson, & Rosch, 1991). The findings suggest that the cognitive aspects of the information seeking process can be supported through a targeted integration of different perceptual modalities. The LibViz project extends the normal channels of information flow between the information representation and the user beyond the textual and integrate information visualization, touch and proprioception. Through the development of a multi-modal search interface LibViz aims to reduce the cognitive load of information processing in the search process and in turn provide more opportunity to engage with serendipitous findings and the creative-reflective component of information seeking. A valuation of this creative-reflective component of search and a recognition of taking time to search has entered the discussion about information retrieval and the conception of tools and is being considered as a design goal for information seeking systems (Dörk, Bennett, & Davies, 2013; Teevan, Collins-Thompson, White, Dumais, & Kim, 2013).

**Medium-Specific Search**

The current dominance of search terms and textual descriptors in search systems stems from an era when the majority of resources to be accessed through the search interface was textual. The textual search tools have reached a tremendous degree of refinement in particular with full text search and analytical tools for large text corpora as examples such as Google's n-gram (Lin et al., 2012) and other meta-analysis tools show. When in the late 1990s efforts were launched to digitize large corpora of images it became clear that the search tools and affordances developed for text retrieval did not adequately satisfy the ways users would search for images. New research projects developed new search interfaces and methodologies and identified meta-information relevant to image search (Ren, Sarvas, & Ćalić, 2010). Those new tools are focused on visual representation and image-specific properties such as color, the distinction of foreground and background or simple shapes (Zehnalová, Horák, & Kudelka, 2013). The user interfaces developed for image retrieval are aiming to implement visual formulation of queries through sketching or pattern choice, even though these interfaces are still rare in real-life use as the technology is so far not fast enough to satisfy search responses in a way users are accustomed to in text search (Szántó, Pozsegovics, Vámossy, & Sergyán, 2011; Wang, Yu, Jia, & Guo, 2011).

With the introduction of large-scale object-digitizing technologies it will be important to again rethink the established search methods in order to integrate object-specific categories and properties. Properties like shape, volume and dynamics will become important in this context, which is a domain of descriptors that has not seen a large amount of research. The LibViz project introduces the notion of medium-specific search tools that reflect the specific properties of the information-carrying medium. The task to make heterogeneous object collections accessible requires a coherent search approach across the different types of media such as rare books, archival documents, images, audio documents, tools etc. At the current state search is mostly conducted through keyword-based library search systems and from there sub-searches can be carried out in dedicated digital image or audio databases. LibViz is rethinking this approach aiming to integrate the different databases and create one coherent search experience across all media types catering to their specific properties.
As image search calls for image-specific interaction methods to formulate queries, also object search will require new forms of human computer interaction methods. People often use gestures to describe the shapes or sizes of objects. These non-verbal gestures form an important part of how we communicate and we are often better at describing an object through gestures rather than through words. Neuroscientists regard gestures as an integrated system of language production and comprehension (Kelly, Manning, & Rodak, 2008). Investigating how gestures can be captured, analyzed and used in the search process will be an important part of creating medium-specific search approaches. The computational analysis of gestures (Holz & Wilson, 2011) and the creation of gestural interfaces are active fields of research.

Project Stages

The LibViz project has three stages that allow the project team to consequently build up methods and technologies to arrive at sustainable solutions. Each stage is accompanied by tests and reviews that ensure that our solutions scale appropriately to the next stage. The LibViz project uses the holdings of the special collections of the University of Southern California as a test-bed to implement and test our approaches. The holdings comprise rare books, archival documents, images, artifacts, costumes, art-objects, tools - like shovels of the groundbreakings of various buildings etc. This diversity of materials gives us a concrete real-life example of the challenges our solutions have to address. As the project progresses through the different stages it will incorporate an increasing number of these collections.

The first – and most immediate – aim of the LibViz project to give special collections librarians an easy way to demonstrate objects without having to go through a paging process to retrieve the objects from the vault. The indirectness and time spent waiting for the item to arrive is a difficulty for patrons who are used to get immediate results to their queries. The tools developed during the first stage of the project enable librarians to quickly respond to user requests and demonstrate the bandwidth of the collections in a fast and flexible fashion. This stage realizes a search interface using a large touch-screen to make a subset of the collections available for presentation. The screen is located in the main reading room of the special collections.

Fig.1 Examples from the artist book collection of USC Special Collections
Key of object representation in the LibViz system is that they are represented visually in addition to the textual search. We do not want to abolish search term-based fast access to items the user knows, but our aim is to add a more playful, serendipitous way of exploring the collection. So far these objects exist in the search database as text records, which hardly give enough information to adequately evaluate the specific contribution they can make to various research interests. In order to forego a lengthy paging process before an object can actually be evaluated in terms of what it provides for a specific research question, such a virtual representation can do a lot to accelerate the process of finding the right objects and it makes it a lot easier to engage with a heterogeneous object collection.

For the first stage of the LibViz project we focused on the artist-book collection of USC Special Collections. The objects come in very different shapes and ways of unfolding their content: They are three dimensional, they have moving parts, they open, they spin, they have little drawers and many other forms of making their argument (see fig. 1). To really understand this type of object it is important to see them, to be able to explore them and to really communicate their characteristics to the user. We have formulated several techniques of representing aspects such as explorable 3d virtual objects; we have an interface to relight objects that have a relief structure so the user can explore how light plays on the three dimensional structure (see fig. 2), and for some objects for which it is important to understand their dynamics, such as their procedural unfolding we have experimented with strategies like stop-motion animation.

These representations are accessed through a search system that is designed to preserve the pleasure and benefit of exploring a collection of real objects in an associative and serendipitous way. The goal is to realize the feeling of walking between shelves looking for one thing but seeing many others that spark interest and connections one would not have while working with a text entry field of a search mask (see fig. 3).

In the two subsequent phases the project will be built out to make gradually the full range of the special collections available through its search interface. The implementation of the search interface will also be scaled to comprise multiple touch-screen terminals on campus all the way to a search client that can be operated on mobile touch screen devices such as iPads.
Fig. 3 Touch-screen interaction with early prototype of LibViz

Conclusions and Prospect

We have given an overview over the main motivating questions of the LibViz project. The project is currently in its first stage and will collect methodologies and user test results to be published once this phase draws to its end. The intention of the discussion in this paper is to share the conceptual underpinnings of the project with the larger research community and contribute to the discourse about the challenges of object digitization. As the technological basis for substantial object digitizing efforts is maturing it is timely and important to engage in a broad discussion about the benefits and dangers and to help shape this new technological infrastructure in the most desirable way.

As the LibViz project moves through the different stages of its realization each of the problems discussed on a general level in this paper will be investigated and result in concrete implementations and user tests. These tests and assessments will be published and shared with the community. They will be the foundation for the interventions of the subsequent phases.

Bibliography


The Architectural Touch: Gestural Approaches to Library Search.

The Near Future

Presented at the 2015 Digital Initiatives Symposium

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University of San Diego

Virginia Kuhn, Associate Director, Institute for Multimedia Literacy, Associate Professor, Division of Media Arts + Practice, School of Cinematic Arts, University of Southern California
Abstract

This paper explores the corollary issues surrounding the planning and execution of the *LibViz*, a tool under development at the University of Southern California, whose main goal is to turn library search into a powerful and pleasurable experience, stimulating engagement with and discovery of library holdings as well as the library itself. Using a series of artists’ books as a prototype, the *LibViz* comprises a tangible interface, novel visualization techniques to represent library holdings, and a visual search engine. The project raises issues around contemporary literacy, fair use and copyright, citation and archiving practices, as well as larger trends in data visualization, physical computing and information representation.
The Architectural Touch: The Near Future

The Architectural Touch: Gestural Approaches to Library Search

The Near Future

The first time I taught a class devoted explicitly to media literacy was also the first time I took students to the Special Collections section of the library. While I had regularly brought classes in to work with reference librarians to foster students’ research skills, this time it was the physical objects we were after, namely the collection of illuminated manuscripts. It was early 2005, with the first rumblings of Web 2.0, YouTube and social media, and students were required to produce media-rich digital projects for the class. In order to combat the notion that the digital is a break with all that has come before, I felt it crucial to explore these early knowledge objects—of particular interest was a high quality facsimile of the Book of Kells—that preceded the printing press. This visit constituted research, but not the type I was used to including in course curricula, that which is far more abstracted, dealing mainly with catalogue and search terms. This was practice-based research. Indeed, there were many similarly physical tasks associated with this class project, *The Digital Illuminated Manuscript*, which was part book, part film, and part website. The planning, location scouting, costuming, performing, filming, editing, and coding were physical tasks even as the end product was fully digital. I mention this as a reminder that there are no clear boundaries between the digital and the material, a fact that the currently popular concept of “the cloud” has effectively obscured.

Over a decade later, the overlap of the physical and the digital is far more pronounced and the link between research and practice is ever thinner as emergent technologies have shifted the ways that knowledge is produced. With its tangible interface, the *LibViz* joins the emergent field of physical computing, several examples of which my colleagues have already detailed. Here I focus on the corollary issues, since most digital projects and initiatives face ideological, technical and logistical challenges, which will only be amplified in the near future. Obviously these are complex and multifaceted matters, so I will simply touch upon a few key issues surrounding the changing nature of literacy, fair use and archiving natively digital projects.

**Literacy?**

The processes by which information is categorized, databases are created and users are posited are all value laden. The ways these structures are established should be more transparent than conventional systems currently allow, which is one reason that digital representations of artists’ books became the first objects to prototype for the project. Artists’ books present unique challenges to archiving and metadata, but they also present wonderful opportunities for visual representation. And when the gestural interface of the *LibViz* is attached to a large-scale database that include all library holdings on the backend, the project will support the type of 21st century literacy that is vital to a thriving public sphere.

Even though literacy is always in transition and nearly always in crisis, the term traditionally means the ability to read and write with words. However, in the current media ecology when one can author with extra-textual registers (image, video, sound, interactivity), received notions of literacy must be expanded to encompass the communicative potential of
these registers. In my role as associate director of the Institute for Multimedia Literacy, I have helped articulate, define and then refine a series of foundational and recommended literacies that include digital literacy, visual literacy, information literacy, as well as several others (see Appendix A). However, in my own scholarly work (which transcends institutional affiliations), I have established a useful working definition that derives from Aristotle’s definition of rhetoric as the ability to see, in any case, the available means of persuasion, and from The New London Group’s seminal manifesto, “A Pedagogy of Multiliteracies: Designing Social Futures,” (1996): with this orientation, I refer to contemporary literacy as *competent control of the available semiotic resources*.

**Fair Use and Copyright**

Fair use and copyright issues are crucial to consider with the *LibViz* project, as well as any project that is infused with overtones of visual and media literacy, and yet they are easily one of the most misunderstood facets of teaching and learning with the extra-textual resources of sound, images and video (Hobbs et al, 2007). Since current copyright law did not anticipate the digital, it must be reconceived, as many argue, including prominent law professor Larry Lessig (Lessig, 2009). Unlike their physical counterparts, for instance, digital books are not exhausted when shared. Thus, in my own research, scholarship and pedagogy, I make it a point to approach this issue from the perspective of fair use, rather than copyright. And this stance is preferable in the context of scholarly work, given the extent to which fair use can be demonstrated via citation protocols. The four tenets of fair use are: the purpose of the use; the transformative nature of the use; the amount of the original used; and, the impact on the market (for the original). By citing the source media, and only using as much of it as is necessary to make a point, fair use is applied.

The beauty of the doctrine of fair use lies in its flexibility, but this also means it is potentially litigated. As a result, many institutions adopt a stance of risk management, fearing the time and expense of litigation, rather than seeing the matter as an issue of free speech. But it is important to exercise fair use, or we risk its loss. The best method of navigating institutional constraints and discouraging copyright infringement claims—many of which are leveled indiscriminately (see Kuhn, 2010c)—is to rehearse fair use arguments proactively. Until such time as copyright is reformed or institutions become less risk averse, exercising fair use is a form of activism.

**Data and Ambient Intelligence**

The New Media Consortium has been publishing *The Horizon Report* series since the report for higher education debuted in 2002. These booklets identify key trends, challenges and developments resulting from the impact of emergent technologies and while initially focused on higher education, they have expanded to include other institutions—K-12, museums, libraries—as well as to other parts of the world. The reports’ content comes from the wider academic community but is curated by a panel that includes experts in the particular content area, as well as those working in technology and education. This cross-disciplinary, cross-institutional collaboration is vital since current disciplines were, by and large, reified during the ascendancy of print literacy and doubtless need reimagining for a digital era. A heterogeneous group is more
likely to rethink jargon and illuminate protocols that have become transparent and, as such, remain unexamined. The *LibViz* team is cross-disciplinary and we hope to expand to other institutions as the project develops.

![ Summary of the NMC’s Horizon Report, 2015 Museum Edition ](image)

The above summary of the *Horizon Report, 2015 Museum Edition* is interesting in both form (an infographic) and content (naming technological trends and timelines). These infographics have recently blossomed as a form of communication since contemporary life inundates us with massive datasets, arising from the digitization of analogue media, as well as from born-digital artifacts. The ways in which we read, interpret and construct the visualizations that represent these datasets becomes another crucial component of literacy and one that the *LibViz* encourages. Even choices about what constitutes a datum can be a contested issue, one with varying points of view depending on disciplinary differences (Drucker, 2011; Kuhn, 2010a).

The content of this infographic is equally interesting for the *LibViz* project. The list of current and future trends include “bring your own device” efforts (e.g. mobile apps) as well as “location based services,” and “natural interfaces.” All of these continue to be concerns of *LibViz*, from its design to its execution. And the design of any such system should be informed by usability but also by ethics given that people’s data can be tracked as they engage with such systems.

Ambient intelligence is a concept that informs the design of large digital systems with embedded computing functions (Aarts, Markopoulos, 2007). The concept of ambient intelligence is less concerned with the back end architecture of these systems and more with the social aspects. As the boxes and screens of computers are integrated into the world, the concepts of trust and security must be reimagined such that these systems support their natural and intelligent use. Interactivity designer Adam Greenfield suggests a set of criteria for the ethical design and deployment of location-based services, which he dubs “everyware” (2006) since once deployed, these systems are very hard to call back. In addition to a system that is well designed or “user friendly, the criteria include a self disclosure mechanism, a way to easily opt out, a contingency for failure that does not harm the user. These are well worth remembering, especially as we
move toward deploying the LibViz on mobile apps that will require user authentication, which means the potential for user tracking also exists.

Archiving Born Digital Projects

In many ways, the artifacts held by special collections, especially the artists’ books prototyped with the LibViz, are more similar to art than to books and this has implications for the metadata schema we adopt. As Susan Luftschein, our LibViz metadata expert, asks, “will we have to establish a new metadata crosswalk?” for this project, which we may well need to. Indeed, Special Collections librarians are used to documenting and indexing non-codex artifacts. But creating a schema for tangible objects is slightly more straightforward than establishing metadata for born-digital projects, which present a different set of issues that dovetail with LibViz as time passes and more library holdings have no material component.

Born digital projects are difficult to archive for many reasons such as media variety and platform obsolescence, but another obstacle lies in their tendency to be ephemeral and dynamic in nature. And in the context of academic work, these obstacles also make it difficult to access and assess the merits of born digital work. In order to counter all these challenge, many projects are documented with photographically and with video. Still images are fairly easy to integrate into text-based documents but they lack the ability to show the dynamic aspects such as gameplay. These aspects make video a great option.

Video provides a somewhat stable means for documenting projects that are ephemeral, idiosyncratic, or whose native platforms are obsolete and it can include words and sound in addition to the moving images, so particular elements of a project can be highlighted via narration. Indeed, in order to document the media-rich digital thesis projects students create in the undergraduate Honors in Multimedia Scholarship program, which enrolls students in every major across the campus, we have turned to video (Kuhn, Johnson, Lopez, 2010). We published twelve of these videos in a webtext for Kairos: A Journal of Rhetoric, Technology, and Pedagogy. The webtext features students discussing their natively digital and media rich theses, as well as the parameters we use for assessment. As the director of the Honors program, I had my own reasons for pursuing the publication—but it soon became clear that one of its most valuable aspects lay in its assessment parameters (Appendix B).

(Contingent) Conclusion

The LibViz hopes to reinvigorate interest and engagement with libraries, reestablishing their status as the public commons. The role that libraries have traditionally played in assembling, analyzing, curating and preserving knowledge objects and cultural heritage artifacts has waned in recent years with the rise of online sources of information. Few are aware of that libraries hold valuable and intriguing cultural artifacts. Further, they often have no idea how to access them in person. By making the search process more visual and tangible, LibViz can bring library holdings closer to a contemporary audience and stimulate exploration and discovery of important cultural and intellectual resources.
References


THE ARCHITECTURAL TOUCH: THE NEAR FUTURE


Appendix A

These foundational and recommended literacies were developed at the Institute for Multimedia Literacy.

Foundational Literacies

Digital Literacy
+ Proficiency with basic tools of digital authoring
+ Understanding of storage, backup, compression, file types, naming conventions, etc.

Network literacy
+ Ability to use network-based software for sophisticated participation in online communities
+ Design literacy
+ Ability to use appropriate design principles in service of critical goals
+ Ability to control and articulate the relationship between form and content

Visual Argumentation
+ Ability to use multimedia to develop and express a persuasive thesis
+ Effective use of evidence and complex thinking in constructing an argument

Research Literacy
+ Ability to perform effective, critical online research
+ Knowledge of academically appropriate protocols for selection, citation and attribution of electronic source materials
+ Knowledge of fair use and copyright issues

Recommended Literacies

Presentation
+ Ability to deploy strategies for effective presentation using multimedia
+ Understand and use appropriate tools for the publication or dissemination of multimedia materials

Visual literacy
+ Ability to convey information visually
+ Understand and control systems of visual signification

Sonic literacy
+ Ability to communicate effectively with sound
+ Understand and work with various components of sound

Interpretation
+ Ability to use multimedia to enhance a critical interpretation
+ Ability to identify and articulate the cultural, historical and ideological contexts of a media object
Annotation
  + Understand strategies for critical annotation of text, images and media

Collaboration
  + Ability to work effectively in a group authoring environment
  + Ability to design and lead a team project

Narrative literacy
  + Knowledge of basic components and genres of narrative
  + Ability to deploy elements of narrative in a critical context

Pedagogical literacy
  + Understand strategies for creating an effective tool for teaching

Interactivity
  + Ability to communicate effectively in a non-linear, interactive format
  + Ability to design an effective interactive interface or navigational structure

Code literacy
  + Ability to understand the basics of how code operates
  + Ability to write or use basic code
Appendix B

These thesis parameters guide the creation of the digital thesis projects done in the Honors in Multimedia Scholarship program in the division of Media Arts + Practice at the University of Southern California’s School of Cinematic Arts. For more on the program, please see: https://cinema.usc.edu/images/iml/SpeakingWithStudents_Webtext1.pdf

CONCEPTUAL CORE
+ The project’s controlling idea must be apparent.
+ The project must be productively aligned with one or more multimedia genres.
+ The project must effectively engage with the primary issue/s of the subject area into which it is intervening.

RESEARCH COMPONENT
+ The project must display evidence of substantive research and thoughtful engagement with its subject matter.
+ The project must use a variety of credible sources and cite them appropriately.
+ The project ought to deploy more than one approach to an issue.

FORM & CONTENT
+ The project’s structural or formal elements must serve the conceptual core.
+ The project’s design decisions must be deliberate, controlled, and defensible.
+ The project’s efficacy must be unencumbered by technical problems.

CREATIVE REALIZATION
+ The project must approach the subject in a creative or innovative manner.
+ The project must use media and design principles effectively.
+ The project must achieve significant goals that could not be realized on paper.
The Architectural Touch: Gestural Approaches to Library Search.

LibViz and Metadata

Presented at the 2015 Digital Initiatives Symposium

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University of San Diego

Susan Luftschein, Archival and Metadata Librarian, USC Libraries
Abstract

LibViz, a gestural search and browse interface for discovery of library materials, will include materials in many formats. These objects have metadata that is one-dimensional. The systems in which this metadata is stored are one-dimensional. LibViz will be three dimensional. How do we apply this one-dimensional metadata to three-dimensional searching? The project will examine the repurposing of existing metadata (metadata management), and how this metadata can or will support the kind of searching we anticipate the project will allow—the ability to find the ofness or aboutness of an object.
The Architectural Touch: Gestural Approaches to Library Search.

LibViz and Metadata

What is metadata?

Metadata is loosely defined as data about data. This definition is so broad as to be generally unusable, which is why when we talk about metadata we are usually referring to descriptive and/or structural metadata. The former is data that describes contents—in libraries that means the contents of books as well as other types of documents and objects; the latter is information about the structure of data, for example, the structure of a MARC (machine readable catalog) record. In the scope of the LibViz project, both will play an important role.

The objects we anticipate including in LibViz will represent many formats—as many formats as we have in Special Collections. Traditional metadata practices include methods of describing (i.e., applying descriptive metadata to) all kinds of objects one would traditionally find in a library. Traditional metadata is one-dimensional—text stored in linear, albeit hierarchical structures. The systems that use this kind of metadata (online public access catalogs, for example) are also one-dimensional. Database structures are one-dimensional (or perhaps two-dimensional—the point is arguable, but they are certainly not three-dimensional). What we hope to do is apply this one (or two)-dimensional metadata to three-dimensional searching.

We also need to consider how we are going to repurpose our existing metadata (metadata management), and how this metadata can or will support the kind of searching we anticipate the project will allow—the ability to find the ofness or aboutness of an object.

Literature review

When I began to think about the role that metadata will play in this project, I realized there were two aspects that I had to consider. The first, and perhaps most important, is the management of our existing metadata. The second is the representation of “ofness and aboutness” or artifactual and evidentiary information.

Accurate and detailed descriptive metadata housed in an appropriate metadata structure is crucial to the process of digitizing, and then finding, special collections materials, and as more materials in library special collections are being digitized, its importance is growing. Much of the literature on the intersection of libraries, cataloging/metadata, and digitization (Deng, 2010; Zentner-Raasch, 2010; Bell, 2012; Laursen, Christiansen, & Olsen, 2012; Ilik, Storlien, & Olivarez, 2014) is focusing on the reuse of descriptive metadata, which makes perfect sense—why reinvent the wheel when we already have perfectly good metadata about our objects in our library catalogs? The question then becomes, how do we get this metadata out of our catalogs with the least amount of intervention and manipulation? Hence metadata management.

A quick review of recent literature reveals a few unsurprising things. First, metadata management is rapidly becoming an important part of the work of catalogers. As new platforms for discovery are created, as new structure standards for metadata are implemented, as more materials are digitized, the need for the management of metadata becomes increasingly important. Second, most of the projects described when discussing metadata management are
attempting to repurpose metadata from one existing system to another existing system. In other words, the platforms and databases in which this metadata was created and currently lives, and into which this metadata is being repurposed, are not new, nor are the structures in use for their creation and reuse. For example, from a MARC-based system, like OCLC’s WorldCat into a Dublin Core-based digital asset management system, like ContentDM. The majority of these kinds of repurposing projects are able to take advantage of the existence of sturdy structural metadata standards, like MARC and Dublin Core.

The second aspect I realized I would need to consider is the role that metadata plays in ofness and aboutness. These concepts have been discussed by library professionals since the 1980s, with the publication of Sarah Shatford Layne’s 1986 article “Analysing the subject of a picture: a theoretical approach”. Recent literature has focused on information seeking behavior in regards to images and their intended use, rather than on subject analysis. See EunKyung Chung and JungWon Yoon’s “Image needs in the context of image use: An exploratory study”, which also includes a good bibliography of recent studies on image searching, retrieval, and use in digital contexts. There is an inherent two-dimensional bias in studies like Chung and Yoon’s that goes back to Layne, and her source in the work of art historian Erwin Panofsky. The idea of ofness or aboutness is derived from Panofsky’s 1955 Meaning in the visual arts : papers in and on art history, in which he describes three levels of meaning: pre-iconographical, iconographical, and iconological. The first two were discussed by Layne as ofness and aboutness in the context of subject cataloging of pictorial works. These concepts attempt to attach to visual images additional levels of analysis and meaning via enhanced description. I have not yet found anyone discussing the importance and description of ofness and aboutness when discussing three dimensional digital surrogates. This raises the question of if and how our descriptive metadata can work in a new context like LibViz.

What makes metadata for special collections unique?

Documents (whether two or three dimensional, books, artworks, etc.) in special collections are housed in these departments because, literally, there is something special about them—age, uniqueness, subject matter, etc. Standard descriptive metadata, like the kind found in traditional library catalogs, is usually not sufficient to adequately describe special collections documents. As any rare book cataloger will tell you, in addition to author/title/subject, rare books (as one example) are generally cataloged at a much more detailed descriptive level. They include not only traditional author/title/subject, but also notes on bindings, publication history, previous owners (provenance), pagination, printer’s marks, etc. (see Figure 1). Archival collections include biographical information, provenance, and scope and contents. All of this information provides researchers with additional avenues of discovery for these kinds of rare and/or unique items.
Fig. 1 USC catalog record for Hartmann Schedel’s *Liber Chronicarum*
Arguably, enhanced descriptive metadata does not usually convey the complete “ofness” or “aboutness” of a rare book, as in the example shown in Figure 1. The former refers to factual subject; the latter to meaning. While this terminology has traditionally been used to discuss description of two-dimensional images (photographs or paintings, for example), I would like to use it in the context of LibViz, as our project can provide a way to enhance searching for ofness and aboutness. I am positing that in a case like LibViz, we are attempting to convey the artifactual and evidentiary qualities of the object, qualities that are akin to, respectively, ofness and aboutness, and which are terms more closely associated with archival materials. The meanings are a bit different--artifactual value refers to the item as a whole, and evidentiary value refers to the contents within its larger context. But there is a relationship between these two sets of meaning that three-dimensional representations of items can reveal and solidify.

LibViz will attempt to address the conveyance of these types of meaning. To discover ofness, researchers can read the catalog record; they will get a good sense, in the abstract, of the factual subject of a rare book. If the object has been digitized, they can also look at two-dimensional representations of that object. If the institution has a sophisticated page turning browser and the entire book has been digitized, they can virtually turn the pages, zoom in (if that capability exists), and examine the object closely in a two-dimensional interface. They can, therefore, also discover its aboutness. Or they can take advantage of projects like the Text Creation Partnership at the University of Michigan, itself a project that built upon early OCR initiatives and that attempts to make texts that cannot be OCR’d available to scholars (Martin, 2007). In addition, text mining and the text encoding initiative are making scientific methodologies for textual analysis available to humanities and social science scholars. While this is exciting for many researchers who do textual or visual analysis of rare books and who cannot see the object in person, this kind of interaction still leaves something to be desired when attempting to ascertain the ofness and aboutness of the object in its entirety. By this I mean the object as a three-dimensional entity--looking at more than just individual pages, but at the wholeness of the object. But...do ofness and aboutness, or artifactual and evidentiary qualities, apply to three dimensional, non-pictorial objects? I believe they do. And does metadata, therefore, play a role in this attempt to convey ofness and aboutness? I believe it does.

Arguably, the development of an interactive, three-dimensional search and browse platform for library objects needs to incorporate these concepts of ofness and aboutness. Conceptual mappings based on concepts other than author/title/subject will require a consideration of metadata that incorporates the kind of descriptive metadata on which special collections catalogers rely. In MARC terms, this metadata can be found in the 5xx fields--notes. Rare book catalogers rely heavily on 590 fields--local general notes (Figure 1). These contain information on a variety of topics unique to the item being cataloged. This information is therefore crucial to providing access to the digital surrogate of a library’s unique item. With other kinds of primary source materials, like those found in archival collections, 520 fields--scope and contents notes--also contain information critical for discovery. The contents of these fields are not governed by structural standards, but neither are they governed by descriptive standards (for the most part). While rare book catalogers and archival catalogers use specialized descriptive standards (DCRM and DACS), there are no hard and fast rules for the construction of the data that these fields are designed to house, although there are certainly best practices. So how do we harvest and repurpose a note like this scope and contents note? (Figure 2)
Questions and problems for this project

When we began discussions for the LibViz project, our discussions surrounding metadata were limited to “yes, we can use catalog data for this.” As the date for this conference drew closer, I began to think more seriously about how we would use this catalog data. A number of questions quickly came to mind—about the management of metadata, about the structural standards we would use and that the database would rely on, about the interface, about repurposing metadata.

Managing metadata

What kind of metadata will we include? How will this metadata affect the search results? What kind of schema should we use to enable sophisticated search and retrieval, on the order of complex digital humanities projects? How do we manipulate existing metadata to allow users to refine searches? How does traditional metadata support new kinds of searching and/or enhance discoverability? Is our existing metadata therefore relevant? Is MARC metadata appropriate for our needs? Is the MARC standard designed to do what we need it to do? And what exactly is that? Managing this metadata therefore becomes a crucial part of the process of designing this new tool.

Structure
Are we building a new platform or a new type of database and will we then have to develop a new metadata crosswalk?

*Interface*

Are we creating a new digital library collection or are we creating a new interface for digital objects? Or both? What will the new system look like from a metadata perspective?

*Repurposing*

How can existing MARC metadata be repurposed beyond Dublin Core, which we currently use for digital surrogates, to enhance the user experience, especially in a virtual 3D environment? Will the metadata need to be reformatted in its repurposing?

*Conclusion*

I don’t claim to have answers (yet) to any of these questions. What I can be confident of, however, is that we have structures and standards in place for both MARC and non-MARC metadata that will, once the project's platform and interface progress, allow for interoperability that will enhance discoverability for both beginning and advanced researchers.
References


