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UXperimentation: The Library as Design Studio
Presentation at Annual Conference of The American Theological Library Association
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The form and function of library services is today in a state of flux. Libraries that are not rapidly changing their services to address new realities in university budgets, scholarly communications, and information media are instead either being reduced or facing reduction with the next regime change at the level of library director or VP of Academics. Libraries that are changing in order to maintain resources and impact within their institutions face the daunting question of how to redeploy resources in ways that are sensitive to local needs and broader professional trends. The focus of my paper is one possible avenue for deployment of library resources that are redirected from activities that are outsourced or e-sourced at lower cost (e.g., LMS support, room reservation, and cataloging), or otherwise rendered obsolete (e.g., periodicals check-in, computer-lab monitoring, and some forms of research/reference support).

The purpose of my paper is to argue for the development of libraries as academic innovation centers and design studios on campus. I will argue that these business models should uniquely connect research and instructional design in our libraries to create desired, predictable, and consistent user experiences among students, faculty, and other target audiences.

Here is the central problem that libraries need to address: at many of our schools in a variety of academic programs, the design of our instruction and research is often disconnected from a needed or desirable user experience. This disconnection is multifaceted. There is disconnection from: 1) other disciplines and perspectives outside a specific academic department, 2) real world challenges and questions, 3) other people who are needed as interlocutors and collaborators, and, 4) disconnection from the needs of users of teaching and research, especially their needs and capacities for understanding.

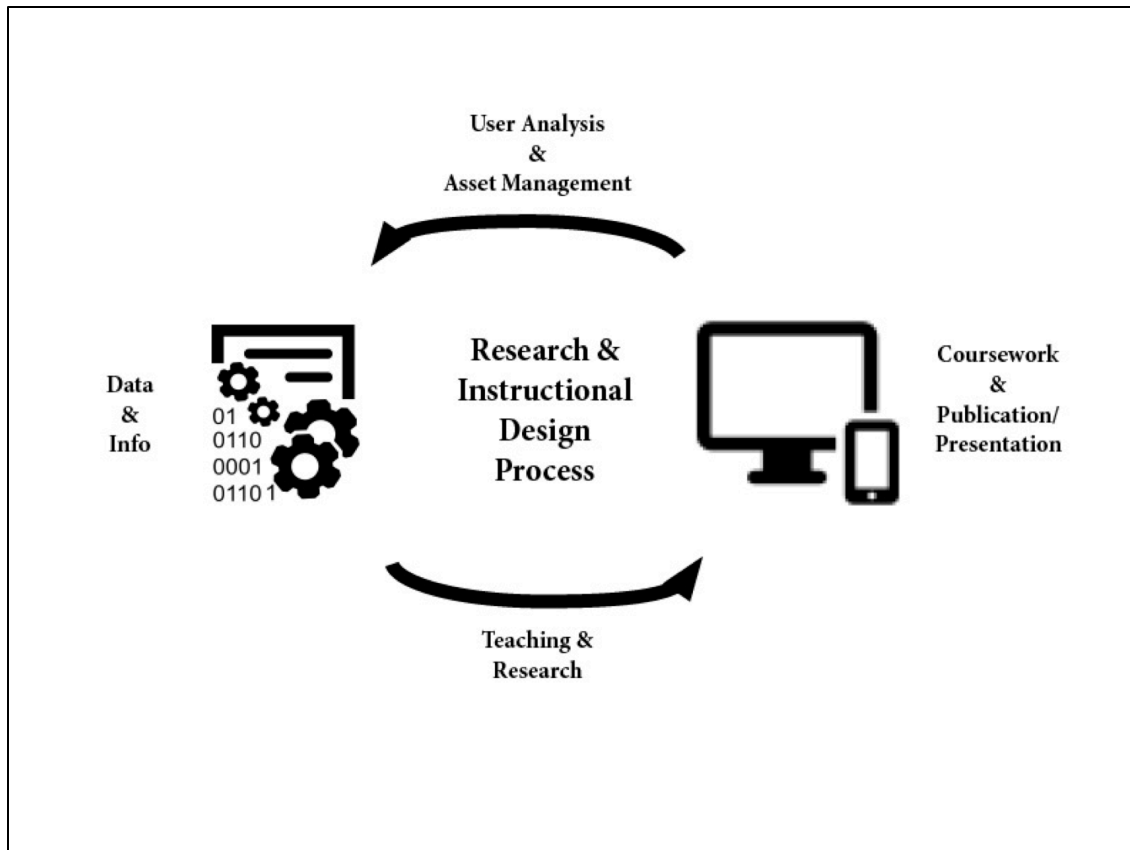
Among the examples of this disconnection is the proverbial “death by Powerpoint” that is still commonplace in academia. The presentation of research in classes and conferences often exhibit a disregard for the cognitive load that they place on users, especially through overcrowding of presentation slides.

Academic administrators are not immune from poor visual communication, and our faculty’s research reports are sometimes not much better, decipherable, perhaps, only to the most initiated.

We in higher education might take solace in the fact that we are not alone in the poor visual communication. News organizations, for example, are not immune to broadcasting poorly designed and misleading graphics.

II. The Research and Instructional Design Process, Revisited

All of our schools have more or less effective processes in place for supporting the design of research and instruction by providing data and information resources, which, in turn, support practices of teaching and research that produce academic courses and research presentations. We have in place processes of data curation, learning management, course evaluation, learning metrics that are intended to better inform what should be an iterative process of instructional and research design. My question is how we can enhance this process, especially with a view to user experience.



In libraries, in the area of educational technology, intense focus has been placed in recent years on the bottom arrow in the figure above, that of leveraging digital data and multimedia information for better learning and research outcomes.

Extensive time and large amounts of money and prime university space have been given to the questions of how digital pedagogies of blended learning, flipped learning, active learning (such as through mobile devices), and massive online learning courses can create a desirable learning experience for students, while meeting the institutional objectives of our schools.

In research, the rise of digital data has transformed the scholarly input and output of many of our faculty. Increasingly libraries are addressing asset management, especially from the standpoint of collecting and curating data for analysis. So we see the rise of institutional repositories, among other strategies.

In digital scholarship, we recognize the importance of computation of data. Big data, whether big through volume, velocity, or importance, is increasingly important to our schools. Scholars and students both are emphasizing practices of analyzing and visualizing data, such as that produced by the Hubble telescope, which transmits about 140 gigabits of raw science data every week. One realization is that visualization is interpretation, which must frame the data from a different perspective, such as the infrared spectrum, in order to bring new insights into view. Or the data is so big and complex, such as in the human genome project and its mapping of most of the human genome's three billion base pairs, that new models and paradigms of visualization must be created.

Not only in the natural sciences, but in the humanities, arts, and social sciences, the quantity and complexity of data is producing new challenges in data storage, analysis, and management, (the library of Congress still has not been able to make its data store of Twitter data available to the public), but is also allowing scholars to ask and answer new types of questions about the human condition—questions both profound and somewhat profane (e.g., the mapping of swear words used in the USA at <https://flowingdata.com/2015/07/17/swear-maps/>).

The central importance of Geographic Information Systems to the scholarly and pedagogical tasks data is evident by the investments in GIS data on our campus, and is enabling new fields of inquiry and insight, such as the circumstances of Holocaust survivors in the days of their evacuation from concentration camps during the brutal winter month before liberation by the Russians in late January 1945.

In addition to data visualization, the media of video is enabling faculty to share their research data in increasingly accessible and compelling ways, such as scholarly storytelling about research, which allows complex ideas to be shared with students and other audiences in an immediate way. For example, at Abilene Christian University, faculty members are supported in the creation of videos to communicate their research findings, e.g., the digital story by Abilene Christian University (ACU) Literature Professor, Laura Carroll, at <https://vimeo.com/127084149>.

An important driver for this big data and other digital scholarship and teaching are federal requirements and repositories for data (e.g., data.gov), which, among other

things is producing a new breed of data storytelling that can communicate powerful narratives about our universe and our human experience through graphical representations of information (e.g., the NY Times project “A History of the Detainee Population” at projects.nytimes.com/guantanamo).

III. Innovation in Physical Library Spaces

These trends in digital scholarship are reshaping the places and practices of our colleges and universities. The rise of new centers for digital scholarship, (see Joan Lippincott, “Trends in Digital Scholarship Centers,” *Educause Review*, June 16, 2014), often in our libraries, is a relatively new development in a series of transformations, that began with computer labs and learning commons, evolved into media studios, such as the AT&T Learning Studio at ACU (<http://blogs.acu.edu/learningstudio>), and are moving into new types of creativity spaces (e.g., the Creativity Studio at NCSU Library), including visualization labs (e.g., CURVE at Georgia State), or data and visualization labs, such as “The Edge” recently constructed at Duke University.

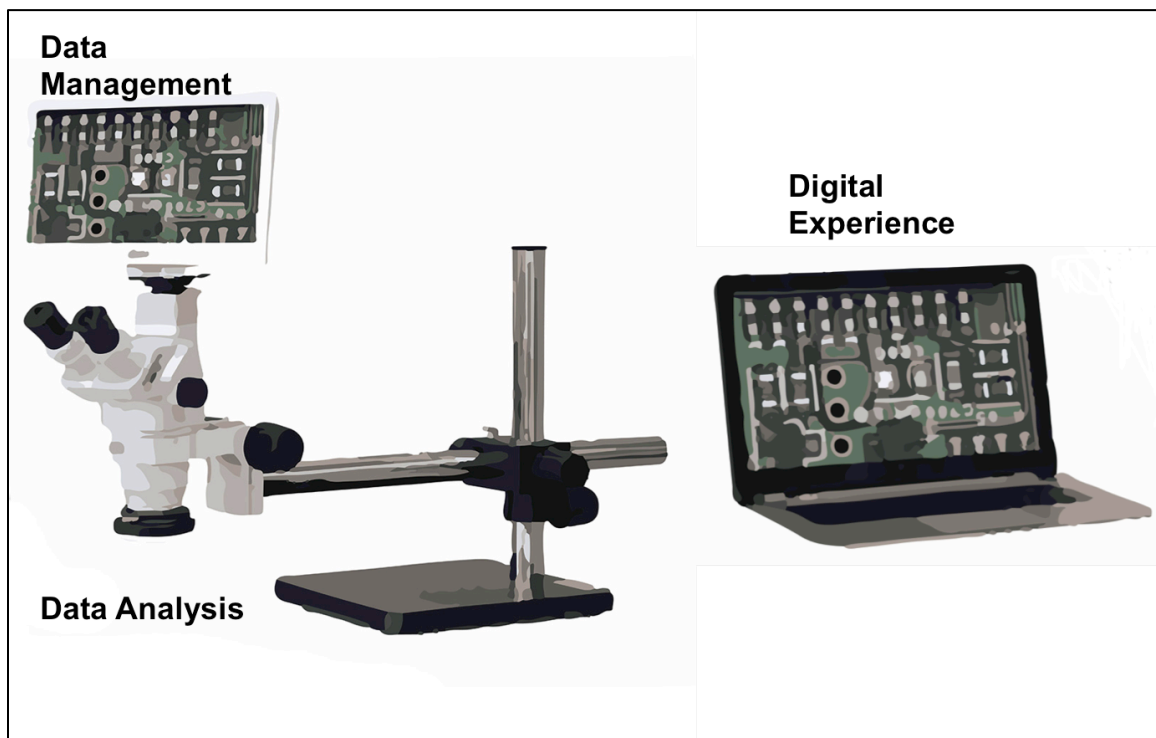
The rise of digital data has, of course, been driven by advances in computing software and hardware, including digital fabrication tools, which have in part pushed to the fore the possibility of constructionist learning, learning by making or doing, in our curricula and the spaces and personnel that support them. Coupled with principles of design thinking, this has led to the creation of Makerspaces (e.g., <http://blogs.acu.edu/makerlab/>) on a number of university campuses, which prototype products, often with a view to the marketplace and user experience. Like our media labs, these makerspaces increasingly utilize creative software to drive tools like laser cutters and CNC routers, which allow for rapid fabrication, and teach our students how to fail fast, to try to create meaningful products from the start, and to innovate early in their program of study, not only at the end. Our students also learn how to design products that are responsive to their environments, including devices that help to address challenges and solve problems, such as recent products in the ACU Maker Lab, e.g., a keyboard for wheelchairs and a therapeutic foot roller (<https://vimeo.com/126307668>).

III. Innovation in Digital Library Spaces

The increasing emphasis on computational methods and digital creativity is transforming not only physical library spaces, but also the digital spaces created and/or licensed by libraries. Creative and analytical software is increasingly important for research and teaching on our campuses, and there is need to democratize access and encourage new literacies for our emerging digital culture. For example, Adobe Creative Cloud tools (www.adobe.com/creativecloud.html) provide faculty and students with collaborative access to the design and visualization tools that are increasingly important to effective communication through images, sounds, videos, and websites.

At ACU, the library has led in the university licensing of Adobe Creative Cloud for all students, and presents to every incoming student about the importance of learning tools and processes for digital creativity. In this way, the library is becoming a design studio, focused on information and ideas, yes, but focused on their collaborative illumination, presentation, and iteration, as in a design studio's methodology. The key growth in the library's role is to focus more on the digital presentation of teaching and research through creative tools, like Adobe Illustrator, Edge Animate, and Premiere Pro. We are seeing the growth of a cottage industry supporting the use of creative software to represent research data and other information through graphical and pictorial.

Looked in the aggregate, the digital spaces of the library are moving toward an more seamless and more purposeful integration of tools for data management, data analysis, and the digital experience of the users of this analysis, who are often our students, other faculty, or interested members of our communities, like church leaders. There is a growing ability of students and faculty to create a digital experience of their teaching and research that goes beyond words and that focuses even more on the user experience of teaching and research.



Libraries have long focused on research as user experience, e.g., in our focus on researcher's use of standard bibliographic citation styles, as well as our focus on authoritative and reliable sources. Now as the data our students and faculty use and create becomes more complex, and as human patterns of communication shift back to the visual, the graphic representation of research data is becoming an

increasingly important skill for librarians to learn, teach, and support through the digital tools they provide, tools like Adobe Creative Cloud.

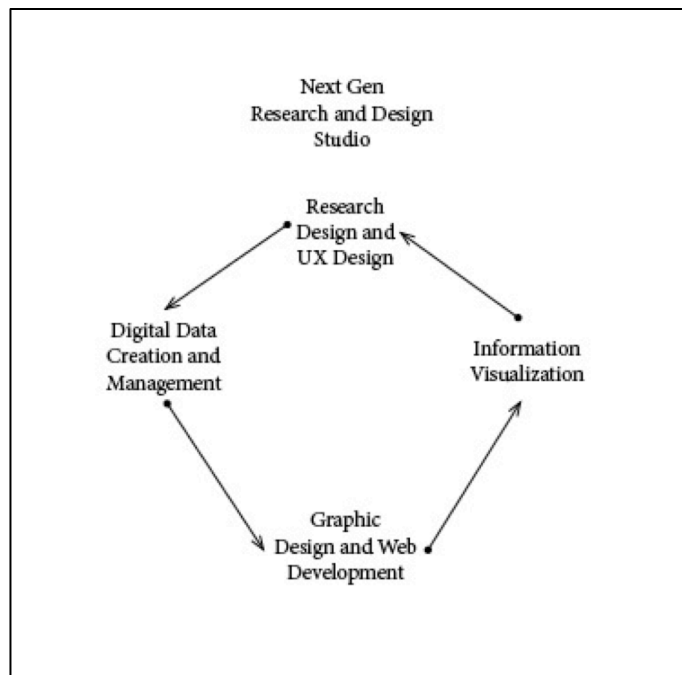
IV. The Library as Design Studio

Beyond the Learning Commons, Media Labs, and even the Digital Scholarship Centers, what we are seeing is the rise of processes and practices in digital teaching and research that emphasize both research design and graphic design as key components. This focus on design is necessitated both by the increasing quantity and complexity of information (design helps to focus and order), and the increasing ability to discover rapidly information and to model an expression of that information (design helps to illuminate a problem and to rapidly prototype a solution).

For example, a student's ability to discover and to seek to address the root causes of poverty in her community is now possible at an unprecedented level. This is due to her ability to articulate an enterprising research goal with a clear focus on the needs of a user and to collect and analyze data on poverty that can be powerfully communicated through visual media in ways that others can see and act on. In large part, these are abilities enabled by the services and resources that libraries are increasingly able to provide.

These abilities are also skills that our schools are increasingly pressing our students to have. These are pedagogical principles we regularly hear or reiterate: the ability to learn by being challenged, to learn by finding and interpreting data, to learn by making something (experiential learning), to learn with your outcome or user in mind, and to learn by and with others (collaborative).

As in a Design Studio methodology, students in our schools and libraries are learning to approach research topics as a challenge or "problem space" that they quickly *illuminate, sketch, present, critique, and iterate* in a collaborative and visually oriented way. When we imagine our future library—the labs and services that will support this methodology—there are at least ten principles that should guide their formation:



1. Provision of para-curricular service, with deep curricular integration
2. Cultivation of teams that are challenge-focused and hyper-collaborative
3. Operation by professional staff, with expertise in project management, data services, educational technology, and digital design
4. Hosting of faculty mentors and student leaders
5. Support of a common core of digital analysis and design tools
6. Pursuit of academic mission with dual focus on research and teaching
7. Support for Data Management, Data Preservation, and Data Sharing
8. Focus on User Experience, bringing insights and innovators into view on Web
9. Engaged in community and globally
10. Development of enterprising and entrepreneurial practices

At ACU, this model of library lab is taking shape in the form of a new space and service called the “Innovation Foundry.” The nature of this prototype and the initial results of its operation are a story for another day.