Redesigning for Usability:
Information Architecture and Usability Testing for Georgia Tech Library's Website

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[ABSTRACT]

Case study

Purpose
To describe the efforts by the Georgia Institute of Technology Library to keep its website relevant and current by incorporating user testing, both outsourced and in-house.

Design/methodology/approach
A chronological history of the Library's web presence with a discussion of how user testing was conducted with a vendor and how future testing will be conducted by the Library itself.

Findings
Illustrates issues the Georgia Institute of Technology Library has faced in regards to its website in the past, and future plans to test the site to maintain currency and strive to meet the users' needs.

Originality/value
This paper offers practical information for undertaking usability testing of a library website.

[KEYWORDS]: Usability Testing, Academic Libraries, Information Architecture, Digital Libraries

Library websites can not afford to be static informational sites; rather, they must be fluid and ever-changing. In many ways a library's website is the library. It used to be that library websites contained information about resources, not the resources themselves, but that's all changed. Now users can, for instance, retrieve full-text articles without leaving the comfort of their homes or dorm rooms. Gone are the days when they had to travel across campus and into the library itself to retrieve a copy of an article. With the increased popularity of distance education and users' demands for online research, it is essential that library websites meet their clients' needs and provide access to a wide variety of information. Currency is thus a major issue for library web designers.

As libraries add an increasing number of often complex resources to their websites, it can become difficult for users to find what they need online. With the addition of databases and other resources, users are faced with searching through a barrage of search interfaces, which can lead to confusion and wasted time. Of course, library websites contain, or provide links to, vendor sites, databases and catalogs, many of which utilize their own interfaces. Library web designers need to focus on creating pages that set and reinforce expectations of searching technologies by supporting screen-to-screen learning while reducing branding changes and maintaining design consistency. Streamlining, therefore, is a second major issue for library web designers.

Two major concepts that apply when designing or redesigning library websites are information architecture and usability. Information architecture is defined as "the structural design of an information space to facilitate task completion and intuitive access to content" (Rosenfeld and Morville, 2002). Usability refers to the measure of success a user achieves when utilizing a product or system, such as a website. Usability combines the following five aspects: ease of learning, efficiency of use, memorability, error frequency and severity, and subjective satisfaction (Usability.gov, n.d.). A successful library website features a solid, sensible information architecture, and is highly usable to non-expert users. This has been the Georgia Tech Library's goal when redesigning its website.

In the last several years the Georgia Tech Library has undergone two major redesigns of its website, the first focusing on utilizing web design best practices and creating a solid information architecture. The second, and current, redesign has been focusing on usability for its non-expert users. The first redesign resulted in soundly-organized information. Once it was confident that the information available via the website was organized well, it focused its attention on how it could make that information easily accessible to its non-expert patrons. In other words, the information was there; how could the Library help users find it?

Early Attempts at a Library Website

The Georgia Tech Library has had a website since the early 1990s. The very first website was designed and maintained by a number of Library employees. At that time, the website primarily consisted of information about the Library and provided access to the telnet version of the Library Catalog. In the late 1990s the Library created the position of Web Developer. With the web resources growing at a rapid rate, the Library decided it needed a point person to implement procedures and maintain consistency across pages. A committee was formed, and a redesign to the very first Library website was underway. The committee consisted of Reference Librarians, Systems employee and various other staff members. While the committee worked hard to develop the website, the primary input was from in-house expert users. For the next several years, the website continued to grow by adding informational pages and a variety of online resources, including an online catalog interface, databases and electronic journals. At that time, the focus was more on quantity instead of quality – content was added to the site with no overall vision for how it would impact the users and their quest to find the information. The site was occasionally tweaked to make everything fit together, but the only suggestions and input were from in-house expert users (i.e., librarians and other staff members that were using the site on a daily basis), without feedback from their student and faculty population. This informal, unorganized methodology continued until the site reached a point where the technology within the site was no longer robust enough to sensibly hold all of the resources added during the past several years. It eventually became obvious that a major overhaul was needed (Figure 1).

Figure 1: Front page before initial redesign
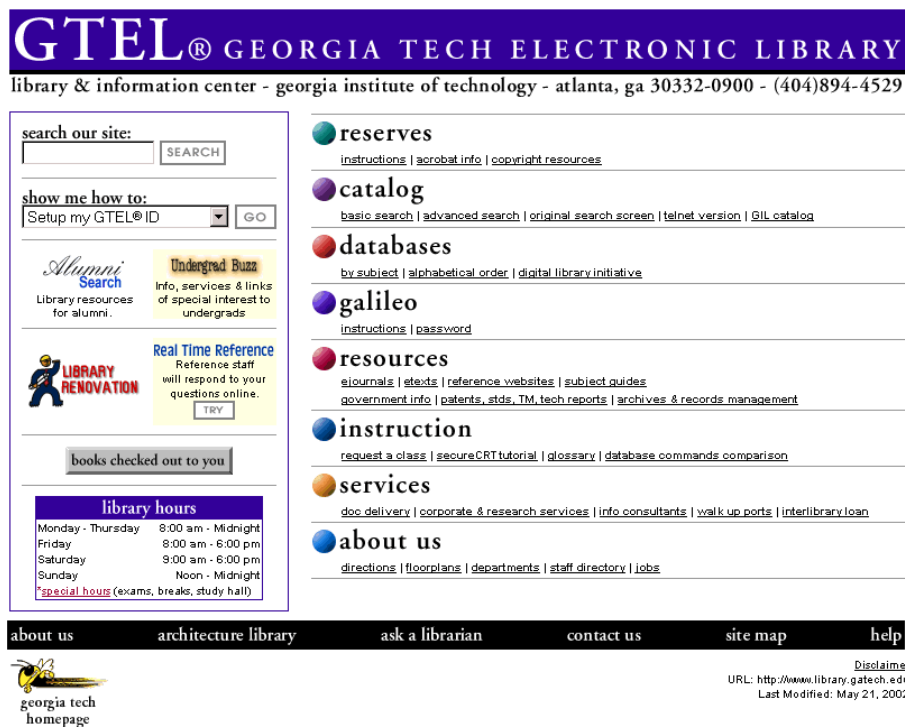
The First Redesign: Focusing on Information Architecture and Best Practices in Website Design

In early 2002 Georgia Tech announced it was working with a local web development and consulting firm, MacQuarium Intelligent Communications, to assist in redesigning the campus website, and the university asked all its departments and colleges to keep their pages consistent with the university's main site. The Library, recognizing the magnitude of a website redesign and agreeing with the need for consistency, hired this firm as well. MacQuarium helped the Library create an entirely new information architecture that utilized the new campus template as a design guide. Together, MacQuarium and the Library performed a competitive analysis, which involved looking at what peer institutions were doing, ran user surveys (focusing on library terminology/jargon), and implemented web design best practices. Once the Library had some rough wireframes (a.k.a. prototypes), its Web Developer met with campus faculty, students and librarians to get their reactions. Using their feedback, the Library continued to fine-tune the wireframes until it had a final structure and design that seemed to meet everyone's needs (Figure 2). All of the pages were created from scratch. In other words, the Library did not simply convert existing pages; rather, it created new pages for the entire site. This allowed the Library to rewrite content, create entirely new content, and delete unnecessary sections and pages. The successfully redesigned website was launched in Autumn 2003 (Figure 3).

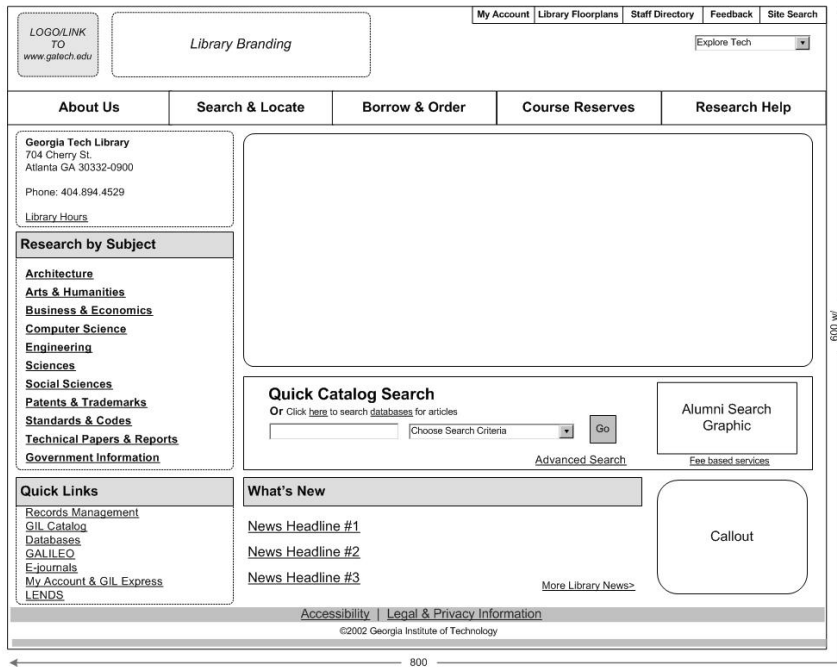Figure 2: Home page wireframe from initial redesign

Figure 3: Home page after initial redesign

The Current Redesign: Focusing on Usability

In Fall 2004, Georgia Tech redesigned the campus site once again. In an effort to stay in line with the campus image, the Library was prompted to take another look at its web design. Before converting to the new campus design, the Library decided to conduct a formal usability study, so its changes would be focused on assisting their users to find the wealth of information available within the Library's multitude of pages and interfaces. It did not want to start reorganizing and redesigning without first getting feedback from their non-expert users.

The Library contracted with a local usability company, User Insight, to assist in this process. By conducting a formal usability study using the talk-aloud method, actual Georgia Tech Library users provided insight that would help as work was begun on the new design. Once User Insight was hired, creation of usability documents started immediately. Their first challenge was to get at least one member of the usability team certified by the Institutional Review Board (IRB), so the study could get approved. IRBs review research studies, and ensure that the rights and safety of human subjects participating in the study are protected. The next hurdle was determining the Library's typical user. The Library thought it would be best to focus on undergraduate and graduate students with little or no experience using the website. It felt these users would provide the most telling data because they would not be familiar with their site and not have established patterns of use. At that point, a screening document was created that would help User Insight recruit the study participants. Next, Georgia Tech Library and User Insight developed the scenarios or tasks that would be used during the user test. Once they had all of the documents created they had to submit them to IRB for approval. After everything was signed off by IRB, they were ready to start the recruitment. The Library sent out an email to 600 randomly-selected undergrads and 300 randomly-selected graduate students. The email asked the students to respond via email if they were interested in participating. The response emails went directly to User Insight. User Insight then randomly phoned potential participants and screened them according to the approved screening document. They recruited a total of eight participants, two for each time slot. This was to ensure they would have participants present for each session. Jakob Nielsen's (2000) research showed that the best usability results are obtained by testing no more than five users. Nielsen (2003) also surveyed usability professionals and they reported an 11% no-show rate among recruited study participants, which is why User Insight double-booked each timeslot.

On the day of the study the usability team assembled at the testing facility, where they would observe each user test and participate in breakout sessions, during which they would discuss what they had observed and create a list of findings that would then establish a list of action items. The following day the team met to discuss how they would handle each action item and determine its priority. Most of the action items would be addressed in the design recommendations provided by User Insight.

Luckily, information architecture on the site as a whole seemed to work quite well. The main problem, it was believed, was guiding users to the appropriate search interface (e.g. catalog, databases and e-journals). The usability test that User Insight conducted showed that the users had no idea why they would visit one resource or interface versus another. This indicated that information literacy was a problem, but the Library could not expect its users to seek out instruction from a librarian when accessing their site remotely, so it would have to focus on ways to guide its users to the right sources via the website. User Insight provided the Library with design recommendations that attempted to guide the user through clear navigational choices. These redesigns would assist the user in informed decision-making by using consistency and screen-to-screen learning. The recommendations supported the user's mental models, not the interface-based searching strategies or the Library's expectations of how users approach the site. The recommended home page design (Figure 4) reflected the new Georgia Tech campus branding. It also utilized consistent content columns. It provided links to the Catalog and Database search instead of subject search. The "Quick Catalog Search" was removed from the home page because all of the users treated it like a Google search, which ultimately led them down the wrong path, resulting in failed searches. The "Quick Links" mainly used by librarians were featured in a drop-down menu, thus cutting down on the clutter and reducing the distraction of our users. The recommended Search & Locate landing page (Figure 5) highlighted the primary ways to locate resources. It featured "3 ways to find what you are looking for." The page maintained consistency in the design and the

layout. It presented a visual hierarchy in the menu. It utilized a breadcrumb trail for easier navigation, and it alerted the user of external links by using a visual cue or icon that would appear next to all external links throughout the site. This was important because it communicated to the user that they were leaving the Library website.

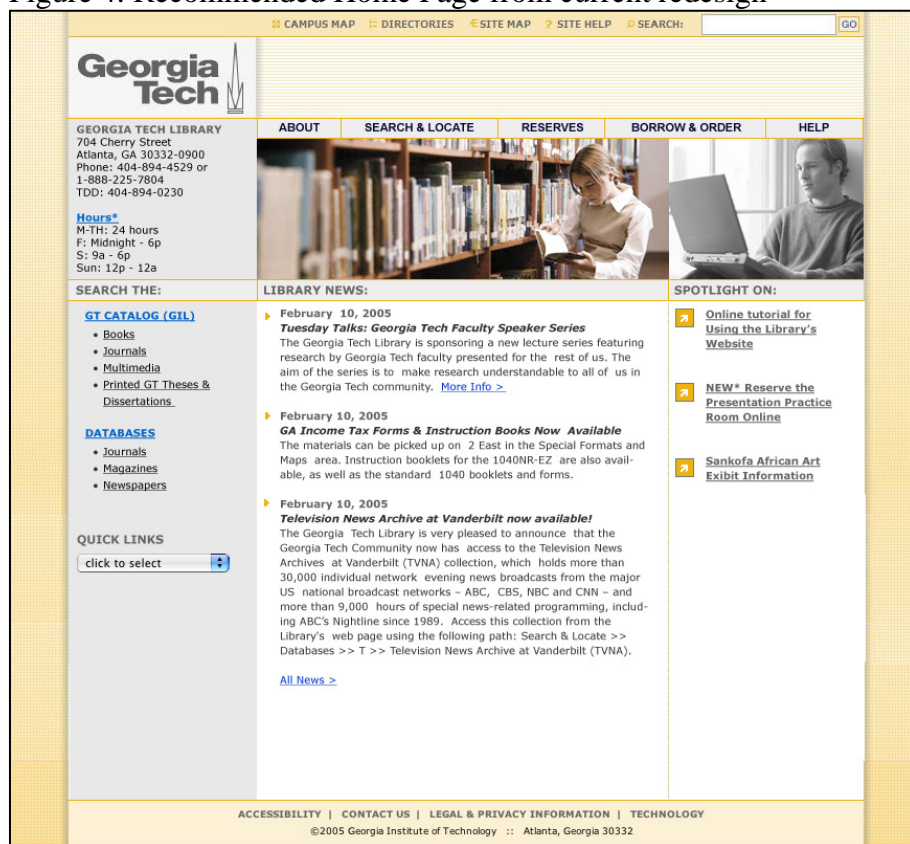Figure 4: Recommended Home Page from current redesign

Figure 5: Recommended Search & Locate landing page from current redesign

Continued Usability Testing at Georgia Tech

One of the desired outcomes from the Georgia Tech Library's work with User Insight was learning more about usability testing so it could conduct testing on their own. The Library is planning a small "lab" in which to conduct these tests. Once the testing area is established, it will test the results of its redesign. After finalizing the top level site redesign, it will not abandon further iterative testing; however, it will also redesign and test other areas of its domain in an effort to improve its entire website presence. One of the first areas it hopes to redesign in the image of the Library site and then test is that under the auspices of the Digital Initiatives Department.

Incorporating Digital Initiatives

The current Digital Initiatives Department was formally created in January 2003 when a Digital Initiatives Manager was hired. Georgia Tech Library had completed digital projects in the past led by the Associate Director for Technical Services. These projects had their own site labeled "Digital Library Initiative" within the library's website. This site looked very much like the library's old site-- basically a text-heavy list of links which belied some of the interesting and useful information contained in the site.

For the first eight months of its existence, the Digital Initiatives Department consisted of one librarian. Charged with creating an electronic theses and dissertations (ETD) program followed by an institutional repository program (http://SMARTech.gatech.edu), the department worked closely with other Library departments on these projects but, in the beginning, did not concern itself with usability. The one concession the department made was to have the Web Developer change the digital projects website. The site was redesigned to look more like the Library's new site.

Using Virginia Tech's ETD software for theses and dissertations and MIT/Hewlett-Packard's DSpace for SMARTech made usability concerns less important for the moment, as information architecture took a back seat to merely getting these initiatives to program status. Using these two out-of the-box solutions allowed them

to concentrate on the content of the projects without having to start from scratch designing user interfaces. It became evident, however, that there are usability issues involved with the out-of the-box solutions as well as branding issues in moving between the various sites of the different projects and the library's page. Compounding these problems is the desire to use the Virginia Tech ETD software only for submission of theses and dissertations, then loading these resources into, and having users search for these works, in SMARTech.

Conclusion

Armed with recommendations on design and information architecture based on usability test findings, the Library will now be redesigning the digital initiatives site and the repository site. Once those sites are redesigned, it will undergo testing in their in-house lab. Digital Initiatives present some difficult challenges for testing. One issue the department anticipates is that the concept of an institutional repository is a new one, and users may have no background for understanding what they will find there. They will start by testing the repository site itself. Once the Library determines that the SMARTech site works for its users, it will develop scenarios where it asks users to begin at the library's site and retrieve an item from the repository – testing the terminology and the functionality.

Over the past decade and a half, Georgia Tech Library and Information Center has had increasingly more complex and better-designed websites, and is currently working on a redesign with the help of a usability testing firm. The need for a site streamlined from the top level down to vendor-provided resources that are current and relevant for their students motivated the latest redesign. Through this process, the Library hoped to learn enough about usability testing to apply best practices throughout its site in an in-house testing lab. The Library plans to establish this lab to follow-up on the work accomplished on the main site and begin testing other areas, including its digital initiatives programs and exhibits, and offerings to distance education students.

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