Introduction

For almost ten years, libraries have been building a tradition of usability testing that serves as an essential resource for all librarians. The rising interest in this kind of study has been brought on by an understanding of the power of the web; web sites are serving as stand-in librarians, information gateways, and sometimes as the primary mode of communication between librarians and patrons. In addition, librarians are facing competition from non-library related web sites such as Google and Yahoo! that do not offer the same access to free resources or value-added services that libraries do, but often offer a more efficient and user-friendly experience. In order to maintain free and efficient access to resources for all users through library web sites, libraries need to continue to hone their usability efforts. By doing so, libraries can provide the highest quality resources and services in order to serve patrons and fulfill the library's mission and obligation to society. As the internet changes and usability testing methods evolve, librarians can benefit from studying both the established library usability literature, and business-driven usability studies. The purpose of this paper is to shed light on some unique aspects of usability testing practices currently being conducted by businesses. These practices can add a fresh perspective to the well-established body of library usability literature and they focus on extracting the kind of in-depth qualitative data that librarians have already recognized as invaluable in creating a usable web site.

Businesses' usability studies

Businesses conduct usability studies to cut costs, streamline operations, and increase profits so that their web sites can function as a self-service kiosk. If users encounter problems and they are not able to complete purchases or tasks online, then they will call customer service for help, ultimately costing the business money. Worse, users may leave the site and do business elsewhere, costing the business more money in lost customers. In his book, The Elements of User Experience: User Centered Design for the Web "Jesse James Garrett explains that "businesses have now come to recognize that providing a quality user experience is an essential, sustainable competitive advantage" (5) Garrett, 2003). He continues, "simply put, if your users have a bad experience, they won't come back" (5) Garrett, 2003). Since businesses want to please existing customers and attract new ones, they need to understand their customers and the current business climate. One way they accomplish this is through usability testing. Currently, businesses are employing several methodologies to conduct usability testing, including: process oriented testing, testing their sites against the competition, conducting extensive interviews and user surveys both at the time of the testing and on separate occasions, creating hybrid forms of testing in which they combine several methods into one, finding new methods of qualitative data gathering, and administering satisfaction surveys after testing. In this way, businesses are taking a multifaceted approach to usability in order to get a holistic view of their users.

The importance of examining business usability studies

As Garrett suggests, businesses know that they must provide an online experience that is "coherent, intuitive, and pleasurable, an experience in which everything works the way it should" (5) Garrett, 2003). Librarians have recognized the value of keeping up with commercial sites because patrons use the web for "personal activities such as online shopping, banking, and news reading, [and] this increases their expectations about the functionality of a library web site" (9) McGillis and Tomis, 2001). [2] Augustine and Greene (2002) asked how their users' searching behaviors have been influenced by popular internet search engines. Dickstein and Mills noted that librarians can emulate businesses' user-centered approach:

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... while the business world has made great strides in focusing on customer service by studying customers’ needs and behaviors, libraries have tended to structure their holdings and services around what they believed was good for their customers ([4] Dickstein and Mills, 2000).

By having user-centered web sites that give users what they want the way they want it, businesses stand to make a profit and libraries can retain and build on their user bases. This symbiotic relationship between libraries and users can only exist if library web sites are intuitive, current, and meet users’ expectations of an online experience. If library users encounter problems, they have alternative information sources; they can leave the library site and go to Google, where they may be willing to pay for resources in return for efficiency and a user-friendly experience. This is a lose-lose situation – users have to sacrifice quality, reliability, and cost, and libraries lose patrons. The reality is that libraries have to compete in the information seeking marketplace; therefore, it is important to stay informed about usability practices outside of libraries.

Process-oriented testing

One case study that is relevant to libraries is the Disneyworld.com web site redesign project. Design expo case studies: Disneyworld.com redesign,” by [12] Sood et al. (2004) Disney World is appropriate for libraries to examine because it offers a huge array of services to its customers through its web site; because of this, it faces many of the same problems libraries do when presenting its reservation services on the web, such as overwhelming options and confusing terminology. The site’s original purpose was to allow users to book vacations online, but because of the “overwhelming scope and breadth of a Disney vacation,” ([12] Sood et al., 2004) users often failed to complete transactions online and called customer service, costing Disney money. One of the goals of the usability study and redesign was to increase bookings and improve the flow of the site, making it easier for users to move around the site ([12] Sood et al., 2004). Because of time constraints, Disney did not do a full contextual inquiry or extensive ethnographic study; instead, they conducted what they called “discovery” usability testing ([12] Sood et al., 2004). The designers at Disney divided users into two categories: “intenders”, or new visitors, and “repeaters”, or returning customers. This terminology frames users in terms of who they are and what they do instead of by statistics that are not directly relevant to user behaviors. As the team approached usability testing, they selected subjects based on these categorizations and did not delve into deeper demographic groups. This is quite different from library usability studies, where there is tendency to try to obtain a demographically representative user sample.

Disney tested 12 users (three intendees and nine repeaters) for 30 to 60 minutes each. The use of such a small pool of test subjects is common to businesses, which seem to be comfortable with the information in the literature by [11] Nielsen (2000) and others about doing iterative testing with small numbers of users. The authors state that they were satisfied with a small user pool: “although the testing consisted of only 12 users, we gained valuable insight to user goals and their vacation planning conceptual model” ([12] Sood et al., 2004).

Unlike typical library usability studies, the first half of the Disney test was conducted without the web site or a prototype of any kind. Instead, it consisted of an interview asking users what steps they take in planning their vacations and what role the Internet plays in the process. For a library, these questions could be centered on the research process. Testers would ask students what steps they take when they are planning a library web site or a project and what role the internet/library web site plays in this process. This focus on discovering users’ processes through interviewing is very different from asking users to complete a series of tasks; it goes further than other usability test methods by encouraging users to discuss their processes. In the second half of the testing, subjects were asked to use the version of the disneyworld.com web site to plan a vacation. In this way, users did not have to complete a series of different tasks, but rather they were instructed to do an elaborate, “real” task that they might actually use the web site to do. This method makes the tester more of a passive observer and gives the user more control.

Side-by-side testing

In the book Customer-Centered Design: A New Approach to Web Usability, [3] Chandler and Hyatt (2003) describe the usability testing of an online shopping environment that sells Hewlett Packard printer cartridges. This study involves testing competitors’ sites alongside the prototype as a different way of measuring a site’s effectiveness. Some relevant objectives of their study were to “understand the current customer shopping experience with e-commerce web sites and to identify customer expectations while performing common tasks” ([3] Chandler and Hyatt, 2003). These objectives focus on understanding the user experience outside of HP’s own site and even its own market. Libraries could stay in tune with current internet trends by broadening the scope of their testing to include non-library sites. The purpose of the study is not to examine tasks, but to uncover customers’ perceptions and expectations of their online experiences in general.

When conducting usability studies, libraries could test one or more library site(s) from comparable institutions against a prototype. If librarians test sites that they think are good models or that approach problems in different ways, they can experiment with variations on features such as navigational structure, labeling, and layout. If certain features work well, then they can be implemented: If they do not work well, then no resources will have been lost in development. For HP, one of the purposes of conducting this type of testing is to “establish overall user perception of the purchasing experience” ([3] Chandler and Hyatt, 2003). For libraries, this would be a way of uncovering user perceptions of library sites and other, possibly commercial sites, such as popular search engines.

When they conducted the testing, HP recruited six users “because six participants are considered statistically significant in this kind of testing” ([3] Chandler and Hyatt, 2003). Again, customers were divided into categories based first on their internet experience level: novice, intermediate or experienced. Only then were they divided into secondary categories based on demographics. For the test itself, users were asked to do ten tasks on a competitor’s site and then to do the same ten tasks on the HP prototype. This kind of side-by-side testing could prove to be a valuable tool for librarians for several reasons - to test the way other library sites do things, to test different versions of the same site, or to educate users on the difference between library and commercial sites.

Test subjects were asked to make a sequence of purchases for the printer that they own. The moderator gave scenarios to the subject one by one, and timed, videotaped, and recorded each scenario. Users were asked to restake their experience after each scenario, which provides immediate qualitative feedback instead of waiting until the end of the testing, when the user might have forgotten about specifics. This also generates more dialogue between the moderator and subject. After going through this process with the first web site (a competitor’s site), the whole process was begun again with the HP prototype. This is a good way of loosening up test subjects and getting them used to the testing works so that they will be even more forthcoming about the prototype.

HP asked the questions:
- How often do you purchase this product?
- Why do you typically buy this product?
- Where do you normally shop for this product?

These open-ended questions could easily be adapted to a library scenario, and this would be a good time to ask other non-directed questions in terms of users’ actual and immediate experience ([8] Kuniavsky, 2002) such as: "Is this something you would use today?" and "What aspects of this site do you find valuable in terms of how you work right now?" ([8] Kuniavsky, 2002). These questions target qualitative information that librarians strive to pull out of users during traditional usability sessions, and since libraries often employ surveys at the end of the testing, this would be a natural addition. Other post-test questions could include: "When you do research, how often do you use the library, if at all?" and "Where do you normally go to fulfill your research needs?" These types of questions could be used in libraries to gain a greater understanding of users’ current research habits.

HP’s data analysis can help librarians organize test data into meaningful categories. While librarians may not have the time or tools to perform extensive data analysis, some aspects of HP’s methods may prove useful; for example, customer challenges are grouped by severity level ([3] Chandler and Hyatt, 2003) and a summary document is created with a matrix of short term and long term problems. Included in this report is a summary of navigational paths that documents whether users completed tasks, met with “dead ends,” purchased the right product or settled for something similar out of frustration ([3] Chandler and Hyatt, 2003).

HP’s reason for testing illustrates why it is crucial for businesses to look outside of their own industries: “usability measurement is your means to ensure that your web site keeps up with the important evolutions” ([3] Chandler and Hyatt, 2003). Businesses recognize the importance of keeping up with changes in the market because their existence depends on it. It is important for librarians to keep looking outside library literature in order to keep pace with the rapid changes in users’ expectations of web sites. Part of this means reducing library testing time and adapting testing methodologies because, as HP has discovered, users have other choices.

The online shopper and customer demographics have changed significantly from when we conducted our initial testing. Today - five years later - purchasers are younger, more savvy, and more conscious about choices. Products in the marketplace are also very different. Customers demand much more from online stores, and if they don’t get what they want, they will make a different choice. Their patience is less than it used to be with the time constraints they face, and they won’t hesitate to try another store if it is easier to operate ([3] Chandler and Hyatt, 2003).
In the article "Personalizing the user experience on IBM.com," by [6] Karat et al. (2003) the authors combined several methodologies in three progressive usability studies to test specific features of IBM.com. They conducted two group sessions and one individual session. These group sessions, or "group walk throughs" ([6] Karat et al., 2003) involved two to six participants and were very different from traditional one-on-one usability testing; however, many of the same techniques were used to measure the success of the sessions. This kind of focus group was conducted in much the same way an individual session would be, with a facilitator, a scribe, and recording equipment. Users were selected based on their experience level with the web and online shopping ([6] Karat et al., 2003).

In each study, about 20 participants were recruited for two hour sessions. The team created "task scenarios" that included a fictional personality for participants to take on as they attempted to complete the tasks. In library usability studies, users usually work through tasks as themselves, but giving them personalities to take on could relieve some of the pressure. The task scenarios were created to represent tasks that "might normally occur over an 18-month period" ([6] Karat et al., 2003), which meant that each task was more complex than the one before and would represent one visit that normally takes up a significant part of the user's time. This is a different take on task progression; normally tasks get progressively more difficult or complex, but the idea of adding a first visit and return visit aspect could be useful when testing a site's learnability. In the group sessions, three scenarios were read aloud to users and users were walked through them as a group using screen shots of the site prototype. After the presentation, there was a five-minute discussion, and comments were recorded on flip charts. This type of hybrid testing combines elements of one-on-one testing and focus groups and can help participants feel more relaxed than in a one-on-one site visit. It also gets users speaking freely to each other in their own vocabulary. In libraries, where jargon is always an issue, this kind of session could function as a way to test users' natural searching behaviors, but also as a way to listen to how they talk about the library site in their own words.

Qualitative data gathering methods

The study "Schwablearning.org: a case study" ([13] Steinberg, 2002) presents some creative ways of collecting qualitative data. Schwab Learning is a small non-profit that employed Sapient, a large web strategy firm, to facilitate its redesign efforts. The methods Sapient used to gather information during the testing process are of interest. They held traditional focus groups, conducted one-on-one in-home interviews, and asked select users to create "visual diaries." The in-home interviews were conducted with seven members of the target audience, and lasted two hours each. In these interviews, users were asked to check out the site and see if they would recommend it, report any problems they might have encountered, and offer general comments. The in-home interviews also included questions about their daily routines and to take photos of their spaces. This type of diary would help libraries get an idea of the day-to-day lives of patrons and how the library fits into their research or other activities, and how they approach tasks. It would also serve to collect samples of users' natural language in an unmediated way. In addition, the blog-like feel of this activity lends it a hip and up-to-date feel that might make participating in it attractive to users.

Two rounds of usability testing were conducted with six users outlining a site's basic structure. This enables testing site structure very early in the design process and without investing a lot. This may seem more labor-intensive than testing a user interface or prototypes (which can suggest a finished product or a lot of hard work). It is also an effective way to test a site's organization early in the process and to find out whether or not it is viable.

User-driven testing

[10] Morgan and Borns (2004) "360 degrees of usability" shows the ways that users can be incorporated into every step of testing. This study profiles e-Bay's usability testing and redesign process of one particular page on their site, the Item Page, which gets over 100 million views a day. This page is very complex with a huge amount of detailed information comparable to a library home page. Because of its complexity, this page was overwhelming to new users. The goal of the redesign was to improve understanding of bidding concepts, and the process itself, as well as to reduce barriers to success. In the redesign, e-Bay introduced a "hand guide" page to help new users understand what was happening on the page. This was designed because it is a "page where users place bids and purchase items. The success or failure of the redesign could therefore affect sellers' financial success" ([10] Morgan and Borns, 2004). e-Bay wanted to be sure its page casted to experienced users, like Disney's repeaters, but was understandable to new users, like Disney's intenders.

e-Bay drew on several different methods to make sure that they were giving customers what they wanted. These methodologies included traditional usability testing, online surveys, and conferences call to focus groups termed "Voice of the customer." Instead of giving users a predesigned set of tasks to complete in a limited amount of time, testing involved users doing actual bidding and buying on a live prototype to simulate "real" tasks. By giving users real money and having them buy one or two items using their choice among their own accounts, the testing approximated natural use of the site, and movements were dictated by users, not testers. e-Bay hoped that this methodology would "simulate a true buying experience" ([10] Morgan and Borns, 2004). Although the tasks were essentially created by users at the time of the testing, traditional factors were still observed and noted. "Usability issues were noted along with user metrics on ease of use, time on task, assists, and error rates. This methodology proved extremely successful in providing the closest possible approximation to real life behavior" ([10] Morgan and Borns, 2004).

After this, a live preview of the new site was launched that allowed users to view the new page from the old page. Again, e-Bay provided an online survey for users to give feedback on the design. This "soft launch" concept worked for both users and e-Bay because users could try it out while e-Bay could collect user data and feedback. e-Bay's method of open dialogue through all phases of the usability testing process empowers users, keeps them in the loop about changes that will occur, and provides a feeling of give and take and openness between the business and the customer. In this way, e-Bay uses its redesign process as a relationship-building tool. "The user community helped drive decisions throughout the design process. User data helped determine the initial needs requirements, design improvements, validation, implementation plan, and future direction" ([10] Morgan and Borns, 2004). Libraries could benefit from involving their users in all phases of usability testing to generate a feeling of goodwill and demonstrate the library's interest in creating user-friendly sites.

Testing satisfaction

End-user satisfaction is often of concern to businesses, but is not often mentioned in library usability studies. "Using the end-user computing satisfaction (EUCS) instrument to measure satisfaction with a web site," a study undertaken at UCLA for application to e-commerce web sites, presents some different dimensions for librarians to think about while conducting usability testing. This type of testing is usually conducted after task-based testing has been completed. The EUCS examines five aspects of end-user satisfaction: "content, accuracy, format, ease of use, and timeliness" ([1] Adbinour-Helm et al., 2005).

In this study, 176 college students were the subjects, and they were divided up into categories based on internet experience level and gender. The Land's End web site was used as a sample e-commerce site. Students were asked to perform five tasks on the site, but instead of being monitored by observers, they were required to record their own results including time on task. No more than ten minutes were allowed for each task, which is more time than usually allotted for tasks on a library web site. Students were instructed to complete the five tasks, the EUCS instrument, and an intent to return survey ([1] Adbinour-Helm et al., 2005). The tasks were complex scenarios which had the students play roles similar to the IBM tests. Because of the long fictional scenarios, this type of testing could be difficult for users to use. It functions less like a test of the user and more like a test of the site and gives the user more time to think. Libraries could perform these tests easily because subjects record their own data. A side effect of this is that it is another opportunity to gather users' natural vocabulary. This could be beneficial to libraries because it is cost-efficient and not as labor-intensive as other methods of usability testing.

The satisfaction survey questions focus purely on the user and follow Kuniavsky's guidelines for well-written, non-directed interview questions. For example, a question assessing the content of the site is: "does the site provide the precise information you need?" Questions such as "do you think the site information is presented in a useful format?" and "was the site information clear?" address the format of the site and how users respond to it. This kind of open-ended question gives users a chance to express themselves in their own words without specific library terms or choices being imposed on them. Asking these types of questions at the end of a task-based usability test would supply librarians with a more complete dimension to the picture of the user. Libraries can use this information to make improvements and increase perceived usability. As Garrett states, "user experience matters to users" ([5] Garrett, 2003), therefore, it should matter to librarians. By placing a premium on end-user satisfaction in usability testing, librarians can test the holistic experience of their web sites instead of just tasks. It could help them to design web sites that will please existing users.

Conclusion

Examining the business literature can help libraries keep up-to-date with emerging trends and pay attention to aspects of usability that have not been emphasized as part of library usability testing. Businesses focus on collecting qualitative data in order to give users what they want and increase profits; in many library studies, librarians often mention the value of the data they gather through informal comments and opinions given after the formal test is over. There are several things that libraries can learn from the business world about testing in order to streamline their processes, extract more qualitative data, and get more insights into user processes and expectations. For instance, in many of the studies undertaken by the large corporations mentioned in this article, testers were confident in evaluating a small pool of users. In addition, these users were often distinguished from each other based on experience level with the internet first and demographic characteristics second.
Businesses include more than just tasks in their tests; they often conduct lengthy interviews to ask users about their processes and daily activities. Many businesses employ hybrid testing techniques, combining two or three different kinds of test methods together. Some, like Hewlett Packard, test competitors' sites alongside their own. Several of the businesses cited in this article are now gravitating towards user-driven testing, or asking users to do "real" or natural tasks; although this allows users to dictate the tasks and replaces a predefined task set, observers use the same metrics to assess the tests. All of these concepts can be applied to library web site usability testing, and in so doing, bring another dimension to the process. The goals of library usability testing remain the same: save the time of the reader and make resources available to all users. Ranganathan's Five Laws of Library Science - especially his fifth, "the library is a growing organism" - suggest that librarians should seek to expand and improve their practices continually, and recognize the importance of helping the library keep pace with the changing world.

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[Reference]

Further Reading

[Appendix]
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Indexing (document details)
Subjects: Tests, Testing, Learning, Internet, Organization theory, Academic libraries, Studies
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