Interface Evaluation: Cognitive Walkthrough

Interface Evaluation of the University of Tennessee Library:

Evaluated Using the Cognitive Walkthrough

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Interface Evaluation of The University of Tennessee Library:

Evaluation Using Cognitive Walkthrough

Cognitive walkthroughs were used to evaluate the interface of the University of Tennessee Knoxville’s Library website. The UTK Library website is located at http://www.lib.utk.edu/. The UTK Library website was chosen because all group members have previously utilized this website. The website is a hub of information resources for the University of Tennessee. The website is designed for use by University of Tennessee undergraduate students, graduate students, faculty, and staff both on campus and at a distance. All evaluators for this project are graduate students at UTK and have previously earned a bachelor's degree with two members attaining advanced degrees including masters and PhD diplomas. One evaluator is also an instructor at the University of Tennessee. The website provides diverse resources covering the wide range of topics that are taught through the university. The cognitive walkthroughs were based on two tasks. One task was to find a book using the title or author. The other task involved identifying a database based on subject. Janet Wingard was the group leader. Corey Dehart, Deepa Deshpande, and Sharon Routh were the evaluators.

Interface Description and Features

The interface of the University of Tennessee Library website has a range of features including: a general search bar, an advanced search option, and a browse search option. Sections of the website are devoted to different types of resources including: articles and databases, e-journals, course reserves, Google Scholar, and the library’s catalog. Resources are also divided by potential users with sections for undergraduates, graduate students, faculty, community, and
distance users. Other features of the website include a libraries news and events section and a chat with a librarian service.

Two features were chosen for the cognitive walkthrough: the general search bar and the articles and databases section. These features were chosen because books and databases are common information sources for many of the website’s users. These features are also centrally located on the interface with books as the first resource type listed in the main search bar and articles and databases listed first under the more research options.

**User Task 1 Description and Benchmarks**

During the Preparatory Phase, group members met and selected the University of Tennessee Knoxville’s Library website, which was familiar for everyone. They also planned that of the two tasks to be analyzed, one would be a fact-finding task and the other would be an open-ended task. Planning for the different roles in completion of the final report was postponed until the results of the evaluators were available for comparison. The group leader then determined the tasks to be completed through addressing the inputs of the Walkthrough as recommended by Wharton et al (1994), including: “Who will be the users of the system?”, “What is the correct action sequence for each task and how is it described?”, and “How is the interface defined?” (p. 6-7).

Task 1 read:

A user is looking for a book on the University of Tennessee Knoxville Library website. The user is looking for the book *Fire in the Brain: Clinical Tales of Hallucination* by Ronald K. Siegel, and needs to know if the book is available for checkout and where to find the book. Write down the book’s availability and call number on the task instruction sheet.
Task 1 is representative of a frequent task that may be performed on the UTK Library website. Students and faculty may often need to search for a book on the library’s website for research or general study. Task 1 is a fact-finding task; this is because the user is given a specific book to search for, allowing for a single correct answer.

The task was created by the group leader, Janet Wingard. A benchmark representing the simplest way to complete Task 1 was also created by the group leader. The task was emailed to the group evaluators, Corey Dehart, Deepa Deshpande, and Sharon Routh, to be completed separately. Each evaluator conducted a cognitive walkthrough of the task with the mindset of an average user of the website. The walkthroughs included listing the actions taken to complete the task, any problems or errors encountered while completing the task, the affective or emotional states of the user during the task, and any questions the users may ask about the website. The evaluators were also asked to keep track of the time it took to complete the task. Any problems were ranked on a scale describing the severity of usability problems. The scale can be viewed in Appendix A. The benchmark was not shared with the evaluators until after the cognitive walkthroughs had been completed individually.

The Benchmark for Task 1:

1.0. Click on the bookmark tab for the University of Tennessee Knoxville Library website.

2.0. Type: “fire in the brain” in the “Search for books, journal titles, media, digital collections…” search box.

2.1. Hit the Enter key.

3.0. Take note of the first result: “Fire in the brain: clinical tales of hallucination.”

3.1. Write down that the book is “Available” in the Hodges Library Stacks.

3.2. Write down the book’s call number: RC553.H3 S54 1992
4.0. End Task.

Total Time: < 1 minute.

Appendix B is a table showing the benchmark for Task 1 and the actions taken during the walkthroughs of the three evaluators in Task 1. Several differences are apparent in the table. The first difference is the method used to reach the University of Tennessee Library website. The benchmark used a bookmark on the web browser, one evaluator searched for “University of Tennessee Library,” two evaluations typed in the website’s address, and the final evaluation returned to the homepage via the library logo. The next difference was the location of the search for the book. The benchmark, and all evaluators, first searched for the book in the main search box on the library’s homepage. One evaluator also used the Find menu as a second searching technique. The final difference is found in an additional step taken by two of the evaluators. After determining that the book was available and writing down the call number for the book, two evaluators went a step further and located the book on a map of the library. The longest evaluation of Task 1 took a total of eight minutes.

**User Task 2 Description and Benchmarks**

Task 2 read:

A user is interested in bird watching and wants to know if the University of Tennessee Knoxville Library website has any bird related resources. Find a database about North American Birds.

Write the name of the database on the task instruction sheet.

Task two is another frequent task that may be completed through the library’s website. Databases are often chosen as general resources for background research. Task two is an open-ended task. This is because the user is instructed to find a database based on a specific subject,
but the database itself is not specified in the task. Open-ended tasks have the potential to have multiple correct answers.

Task 2 was created by the group leader. The group leader also created a benchmark representing the simplest way to complete Task 2. The task was emailed to the group evaluators along with task one, to be completed separately. Each evaluator conducted a cognitive walkthrough of the task with the mindset of an average user of the website. The walkthroughs included listing the actions taken to complete the task, any problems or errors encountered while completing the task, the affective or emotional states of the user during the task, and any questions the users may ask about the website. The evaluators were also asked to keep track of the time it took to complete the task. Any problems were ranked on a scale describing the severity of usability problems. The scale can be viewed in Appendix A. The benchmark was not shared with the evaluators until after the cognitive walkthroughs had been completed individually.

Task 2 Benchmark:

1.0. Click on the back button to return to the UTK Library homepage.
2.0. Select “Articles and Databases” under the main search box.
3.0. Select “Biology” under the “By Subject” header.
3.1. Scroll down.
3.2. Find the database Birds of North America Online.
3.3. End Task.

Appendix C is a table comparing the benchmark to the actions taken by the evaluators.

Task 2 resulted in more uniform actions than Task 1, but several differences were noted. First, the method of returning to the University of Tennessee Library homepage differed among the
benchmark and evaluators. Everyone selected the link for “Articles and Databases.” The benchmark and two evaluators selected “Biology” under the “By Subject” header. One evaluator opted to browse the “Complete List of Databases.” Scrolling was required for locating the database in every case. Everyone selected *Birds of North America Online* as the answer to Task 2.

**Problems and Error Descriptions: Task 1**

1) Whether to type the book title and author in the Main Search Box or to search in the Find menu under Books and Media:

   Although all three evaluators were able to easily find the book by typing in or copy-pasting either the title of the book alone or the title along with the author’s name into the search box on the website’s home page, one of the evaluators wondered if a novice user (possibly a freshman from a small town, or someone whose web usage had been well below the average) might think to choose from one of the two options that are displayed visibly on the main page. The first option was the search box and the second was to choose ‘Books and Media’ from the menu that drops down when the cursor hovers over the ‘Find’ tab on the toolbar visible at the top of the page just under the library logo. The ‘Books and Media’ option is displayed in Figure 1.

*Figure 1. ‘Books and Media’ option*
When the second option was tried, the user was taken to a different page, as shown in Figure 2, with a smaller search box at the top left corner. By typing in the title and author name into the search box, the same result was obtained as from pursuing the first option. The difference between the two options was just an increase of one step or mouse click, and a slight delay that may be caused if the user briefly pauses to deliberate over the decision of choice between two competing options.

Figure 2. ‘Books and Media’ option

The other problem common to both options is for the novice user who may wonder how to get back to the homepage since there is no specific button providing such an option visibly. This problem was discovered in Task 2 as well and is described therein. Applying Nielsen’s rating scale, the problem of availability of competing links does not seem to be a usability problem that needs to be fixed at all.

Two evaluators did not perceive this as a problem and the other evaluator agreed that it was mostly a cosmetic problem, with a severity rating of not more than 1, making it unnecessary to fix the problem immediately.

2) Difficulty reading UT Library map:
Although locating the physical location of the book, *Fire in the Brain: Clinical Tales of Hallucination*, was not intended to be part of the task, two team members interpreted the “where to find the book” component of the instructions as meaning determine where the book is located in the library. The “View Map” button, seen in Figure 3, is easily visible next to the bibliographic information, which was retrieved from the search by book title, and both evaluators determined that most users would probably access this feature to locate the book.

![UT Libraries Results Webpage for Fire in the Brain](image)

*Figure 3. UT Libraries Results Webpage for Fire in the Brain*

The problems encountered upon opening the map webpage include the user’s inability to identify the elevators and the exact location of the book. The elevators are listed through a text box description as “red rectangles” while the book location was marked by an orange pin on the map. Both colors are faint with the elevator color appearing more orange and the pin a faint yellow as seen in Figure 4. These color inconsistencies were determined to be a minor cosmetic problem for users once Jakob Nielsen’s severity scale ratings were applied. As a result, this problem was initially given a score of 1 meaning that this problem only needs to be corrected if extra time is available on the project (Nielsen, 1995a). According to Tognazzini, however, colorblindness is somewhat common since “approximately 10% of human males, along with
fewer than 1% of females, have some form of color blindness” (2014). Upon reflection of the color inconsistency, group members agreed that for disabled users, including color blind and visually impaired users, the severity rating should be increased to a 3 meaning that the problem is a Major Usability Problem and as a result the priority level for correcting colors should be high (Nielsen, 1995b).

Figure 4. “View Map” option for locating the book *Fire in the Brain*

Choice of colors on the same screen for displaying an important illustrative feature such as maps should be given careful consideration by taking into account the following factors:

(i) Color degradation of image in transmission may cause the colors to be displayed as different from what the supporting textual guidelines claim

(ii) Choice of colors belonging to the same primary color family such as orange and red for displaying images, icons or symbols in the same visual area should be avoided because the objects may present themselves as indistinguishable by virtue of color, making it difficult for the user to locate them on the illustration, as was found in the case of elevators and the other markers around it, on the map displayed by the interface.
Problems and Error Descriptions: Task 2

1) No Apparent Home Button to return to the UTK Library Homepage:

This problem was experienced by all three evaluators in both tasks, because the subsequent pages do not provide a clearly visible button or option to go back to the home page if the user so desires. The novice user may not know that he could click on the ‘UT Libraries’ logo at the top to return to the home page. The Libraries logo is shown in Figure 5. The other option available is to use the ‘back’ arrow of the browser.

Figure 5. ‘UT Libraries’ logo

Two evaluators felt that a severity rating of 2 should be given, while the third evaluator felt it was at a severity level of 3, with a consensus for 2 after discussion. Applying Nielsen’s criteria of frequency, impact and persistence, the problem would be experienced frequently
throughout the interface by all users until they figured out that clicking on the logo would take them back to the home page. The rating is low because an alternative option of using the browser’s back button is always available to the user.

According to Shneiderman, “as much as possible, actions should be reversible.” This would relieve anxiety for the user, since the user would know his actions can be undone, and hence would be encouraged to explore unfamiliar actions. The problem could be fixed by providing a specific tab for ‘home’ on the toolbar that is visible at the top of all pages of the interface.

2) No Search Box for a Subject Search within the Databases:

All three group members experienced slight anxiety upon the selection of the shortcut link to “All Articles and Databases” since there was no Search Box available to search by subject within the databases. The only search boxes on this webpage available for users included a search box at the top center of the page to search by keywords within the entire utk.edu website, and another search box below this to “Find Database by Name.” The “Find Database by Name” search box is shown in Figure 6. This created frustration for all of the participants due to the need to scroll lists of subjects or databases.

![Figure 6. University of Tennessee Libraries Articles and Databases Webpage](image-url)
Since potential users, may not know the name of the database needed, all group members rejected the “Find Databases by Name” search box possibility for finding the database. There were several other options available for users to find a database without a subject search within the database field including scanning a “Complete List of Databases”, searching databases “By Subject” or searching “By Type”. Since the majority of users would not consult a research guide, article list, or E-Resource tutorials to simply find a database these means of selection were not considered as options by all three evaluators.

As a result, this problem was given a severity rating of 2 on Nielsen’s scale meaning it is a Minor Usability Problem and “fixing it should be given low priority” (Nielsen, 1995b). This feature should eventually be addressed, however, since Nielsen (1995a) also recommends in his “10 Heuristics” that Consistency and Standards are general principles needed in interface design as does Schneiderman (2010) who recommends that an interface “strive for consistency” (p. 70) across varied websites and interface options. Users expect common features and functions across diverse website according to all usability guidelines studied by the evaluators and therefore a search box for most components (articles, databases, E-resources, etc.) of a university website would be expected to include a search by subject search box similar to Google, Yahoo, social media, and vendor websites.

One excellent solution discovered for this problem was found through looking at a couple of different library interfaces used in prestigious university systems. Harvard University Library provides a more easily searchable interface with links for diverse search methods provided in a menu on the left hand side of the library home page. A screen shot of the Harvard University Library homepage is shown in Figure 7. The Harvard Library Homepage, and all linked library search webpages, provide an aesthetic minimalist design, with a familiar approach to the
interface which is available for multiple websites as recommended in the “Eight Golden Rules of interface design” (Schneiderman, 2010, 70), “10 Usability Heuristics for Interface Design” (Nielsen, 1995a), and “First Principles of Interaction Design” (Togognazzini, 2014).

Figure 7. Harvard University Library Homepage

By selecting the “All E-Resources” option from the menu on the Harvard Library Homepage, a user is provided with a search within the electronic resource field. Three options are available within this field including searches “By Keyword/Title keyword,” “A-Z Title List,” and “Browse By Subject.” The search box within the All E-Resources field of Harvard Library is seen in Figure 8 showing additional search options above the search box. These options provide all users, from novice to advanced, the ability to search with familiar interface methods utilizing different interaction styles as recommended by Schneiderman (2010) including direct manipulation and menu selection styles (p. 67).
The results page provided by Harvard Library for a keyword search for “Birds” is easily readable and minimalistic. The results for this search within the All E-Resources field, includes three resources: *Birds of North America*, *IUCN Red List of Threatened Species*, and *Zoological Record Plus*. The search results are shown in Figure 9. The option to search by keyword reduces the memory load on the user (Nielsen, 1995a) allowing her to easily interpret “keywords” as a subject category thereby providing a “well marked road and landmark” for completion of the task (Toggnazzini, 2014).
3) Necessity to scroll to find the relevant database

One evaluator chose to search by scanning the “Complete List of Databases” and easily found the required database. After specifically scanning for Aves, Aviary, and Birds, the evaluator was able to locate “Birds of North America” upon scrolling through the list of database names. This method for finding the database was determined with the consideration that users would probably be anxious and frustrated and would therefore look for an obvious solution first such as a scan for the main subject “birds”, or a synonym/translation of that word, as the first word in the database title.

Two of the evaluators chose to search by subject when looking for the database on North American birds. Luckily, both evaluators chose the Biology subject area in which the database was located. However, when the list of databases within this subject area was displayed on the next webpage, each separate database was accompanied by two to three lines of text describing the database. This extra text allowed only a few databases to appear at a time and caused the
evaluators to have to scroll down a long list of subjects to find the desired link. A screen shot of the list of databases by subject: biology is shown in Figure 10.

Because scrolling is not considered a major problem, this issue was assigned a severity rating of 2 and was given low priority (Nielsen, 1995b). When considering possible solutions for this issue, one evaluator considered a previous experience with the online academic catalog. A screen shot of the online academic catalog is shown in Figure 11. On that webpage, several courses were listed on the same page, and a pop-up window appeared giving more information when a specific course’s link was clicked. The library’s website could use this approach when listing their databases, thus saving valuable real estate on the page and allowing all of the databases to be shown without having to scroll. These considerations were again based on Nielsen’s “10 Heuristics for User Interface Design,” especially “Match between system and the real world” (notably the university system), and “Consistency and standards” across the interface itself (Nielsen, 1995a). ok.

Figure 10. List of Biology Databases.
Best Success and Worst Failure Story Descriptions

According to Wharton, Rieman, Clayton, Lewis and Polson, the Cognitive Walkthrough Method allows evaluators to construct a story about how a typical user interacts with a specific interface (Wharton, 1994, p. 3). When the actions of members were analyzed each step was examined in order to tell the complete story and determine the specific features of the interface which would link the “user’s task description and the correct action” (Wharton, 1994, p. 9). As group members looked at each component of the task, they asked themselves the following questions that are addressed in Wharton’s article:

- Will the user try to achieve the right effect?
- Will the user notice that the correct action is available?
- Will the user associate the correct action with the effect they are trying to achieve?
- If the correct action is performed, will the user see that progress is being made toward solution of their task?

(Wharton, 1994, p. 3)
Best Success Story: Task 1

Task 1 read: A user is looking for a book on the University of Tennessee Knoxville Library website. The user is looking for the book *Fire in the Brain: Clinical Tales of Hallucination* by Ronald K. Siegel, and needs to know if the book is available for checkout and where to find the book. Write down the book’s availability and call number on the task instruction sheet.

The best success story for Task 1 involved the evaluator copying the author and title of the assigned book from the online assignment sheet and then pasting it into the Main Search Box on the UTK Library Homepage. After doing this the evaluator then clicked enter, on her computer keyboard, to retrieve the results page. The results page was viewed and the availability of the book was immediately noted as marked by a bright green bullet as seen in Figure 1. The evaluator took a few more seconds to easily determine the call number of the book, which was located next to the availability note. She then recorded both answers to the task, the call number and availability, on the printed assignment sheet. The user then clicked on the “View Map” button and retrieved the exact location of the book. This action took the longest, consisting of about a minute and a half, to determine that the red color denoting the elevators actually appeared orange and the orange pin marking the book location actually appeared yellow.

The evaluator effectively addressed the criteria from the analysis questions suggested in Wharton’s article of the Cognitive Walkthrough. She tried to achieve the right effect by selecting the Search Box, a uniform selector available for all users on most websites, to look up the location, call number, and availability of the item. She noticed that the correct action, reading the bibliographic entry, was available as evidenced through her noting of the green bullet marking both the availability and call number of the resource. The correct action was available and easily visible for users via the “View Map” button to pinpoint the location of the item.
Finally, the evaluator easily saw that progress was available toward solution of the task as she wrote down the availability of the item as well as the call number and then the specific location of the item on the fifth floor of the library, behind and to the right of the elevator entrance.

Through application of the benchmark, this action story was deemed credible. As all evaluators accessed the university library web page through typing in the URL of the library, the benchmark for accessing a tab is consistent with entering a memorized URL followed by hitting the Enter key for starting the application. The next step in the benchmark to type or paste the title in the search box, are also familiar actions for the user group of this website “because they have experience using a system” and “Because the system tells them to do it” (Wharton, 1994, p. 13) through the instructions in the search box to “Search for books, journal titles, articles,...”. The user will know that “everything is going OK” (Wharton, 1994, p. 13) when they see the bibliographic information returned by the search with call number and availability both noted and highlighted by a green bullet.

**Worst Success Story: Task 1**

The worst success story for Task 1 consisted of the user not noticing that the correct action was available to perform step 2.0 of the benchmarked actions. Assuming that the user is a legitimate user of the UTK Library’s website, the user would be able to achieve the right effect while performing step 1.0 of the benchmarked actions, which consisted of going to the home page. But the availability of competing actions, as she tried to achieve the right effect, prevented her from noticing that the correct action of typing the name of the title in the search box was available. She was distracted instead by the ‘Find’ tab on the toolbar, which displayed a drop down menu as her cursor hovered over the word ‘find’.
On noticing the option ‘books and media’, the user clicked on it and correctly associated it with the effect of finding the book that she was trying to achieve. When she performed the action of clicking on ‘books and media’, the interface displayed another screen that contained a search box at the top left corner of the page. Since that was the only option of achieving the right effect of locating the book, she correctly associated it with the effect she was trying to achieve, and typed the title’s name into the search box. The interface displayed the result that was the availability of the title on the Hodges library stacks, and the user saw that progress was made towards obtaining the book title. The entire process took less than a minute.

The user’s actions were different from the benchmarks, from step 2.0 because she either failed to notice that the search box was available, or failed to associate it with the effect she was trying to achieve, or was distracted by the availability of a competing link and chose to pursue it instead. Either way, the number of mouse clicks increased by one, when she decided to pursue the option described here. However, she was able to achieve the effect successfully, and an increase of just one mouse click was not evaluated to be a usability issue.

The user noted down the accession number and decided to check out the location of the title on the library stack. She noticed the button that displayed the words ‘view map’, associated it correctly with the effect she was trying to achieve, and clicked on it. She saw that she was making progress when the interface displayed a floor map and guidelines to locate the book. The problem that arose and has been described above was with a mismatch between the displayed color and the color mentioned in the guidelines arose in reading the displayed map to identify the physical location of the book.
Best Success Story: Task 2

Task 2 read: A user is interested in bird watching and wants to know if the University of Tennessee Knoxville Library website has any bird related resources. Find a database about North American Birds. Write the name of the database on the task instruction sheet.

The best success story for task 2 consisted of the user correctly following all benchmarked actions, as per the four questions described by Wharton (1994). She knew from experience that she would reach the library’s website by typing in the URL into her browser. She knew to look around for links to achieve the right effect of finding the database. She noticed the link ‘Articles and Databases’ under the main search box and associated it correctly with the effect of finding a database about North American birds. She clicked on the link and reached a screen displaying an alphabetical list of subjects, and saw that progress was being made. She noticed the link for ‘Biology’ and correctly associated it with birds from prior knowledge. When she clicked on it, she could see that progress was being made in finding the database because a listing of databases appeared on the screen. She tried to find a bird related database by scrolling down the list, and found the database, ‘Birds of North America Online’. She knew that she would reach the database by clicking on it. After clicking, she reached the homepage of the database and knew that she had succeeded in finding the resource she was looking for.

Worst Success Story: Task 2

The worst success story for Task 2 involved the indecision met by all three evaluators when deciding how to proceed when searching for the assigned database. Once the main database page had been accessed, there were no clear guidelines to assist the user in finding the correct database. There was a search box that allowed users to search for a specific database by name, but, if the user did not know that name, that search box was useless. There were also
options for a) searching all databases, b) searching by subject, and c) searching by type. One of the evaluators chose the first option and eventually found the relevant database after scrolling through several pages. The other two evaluators used the second option and searched by subject area. Both users guessed (correctly) that the database on North American birds would be found in the *Biology* subject area, and both were able to find the appropriate database after scrolling down just a few pages. All three users reported frustration and indecision when first attempting to locate this database.

Through application of the benchmark to this action story, it was determined to be the worst failure story. Failure was seen in two of the criterion including the first criteria to return to the homepage and the third criterion to search by subject for the database. First, users as previously mentioned, either have a bookmarked or memorized URL for accessing the library homepage. The ideal method for returning to the homepage was not visible, or identified, to users as a shortcut to the homepage. Many users would not know that the UT Libraries or Libraries icon in the upper left hand corner of each library web page was actually the shortcut back to the home page. As a result, evaluators determined that most users would follow the same path as they initially used to access the library homepage such as typing the URL into the browser or accessing a bookmark. The second step in the benchmark to select the shortcut “Articles and Databases” is easily visible below the main search box on the homepage and is again familiar to the user group so will usually be successful. The third step in the benchmark is where the failure is again evident, as users will have difficulty determining how to achieve the desired goal. All evaluators determined that “Will the User Know that The Correct Action Will Achieve The Desired Effect?” very good. criterion was not met since users would not know immediately how to select the correct database and would have to scroll lists of either subjects or
databases. Additionally, users would not know which choice to select for optimal results with the options to search by a “Complete List of Databases”, “By Subject” or “By Type” all seeming equally feasible. The need to scroll lists for any of the options creates frustration for users, as previously mentioned, and does not allow users to see “If the correct action is taken, will the user see that things are going OK?” Until, the database is found, users experience anxiety wondering if this was the correct action to take to find the database.

**Questions Raised**

For Task 1, only a few minor questions were raised and none had an impact on the completion of the task for an average user. These questions included: “Should I choose the main search box?” and “Where are the red rectangles and orange pin on the map?” The second question would, however, have a major impact on a disabled user’s completion of the task. As previously mentioned, a colorblind or visually impaired user would not be able to distinguish between the color inconsistencies in the “Help” instructions and would be unable to locate the physical location of the book leading to an inability to associate the correct action with the completion of the task.

For Task 2, several questions were raised including: “How do I return to the library Homepage?”, “How do I search by subject without a subject search box available within the database field?”, “Which option should I choose out of the five available options to find a database about ‘North American Birds?’”. According to the article, “Cognitive Walkthrough for the Web”, two of the authors of the original “Cognitive Walkthrough Method” emphasize that the most critical questions pertaining to web navigation include: “Will the user connect the correct sub-region of the page with the goal using heading information and her understanding of the sites page layout conventions?”, and “Will the user connect the goal with the correct widget
in the attended to sub-region of the page using link labels and other kinds of descriptive information?” (Blackmon, 2002, 463). In Task 2 the questions raised all addressed these two critical questions and resulted in the user’s ability to select alternatives from the web page's layout to achieve the desired goal. All users were able to access link labels including “Complete List of Databases” and “By Subject: Biology” which connected the goal with the lists offered through following these links.

Summary and Conclusion

The cognitive walkthroughs conducted by this group for the University of Tennessee Library website originally found only cosmetic or minor usability problems. On the severity rating scale, cosmetic problems are 1s and should only be fixed if there is extra time available. Minor usability problems are 2s and these problems are given a low priority. The problems encountered include: a poorly labeled homepage button, the misleading color coordination of the map feature for finding books in Hoskins Library, the lack of a search by subject feature for the databases, and the need for users to scroll to find a database within a list. After review, the usability issue found in the map of Hoskins was promoted to a 3 on the severity rating scale or a major usability problem that needs to be fixed, because the colors may make it impossible for those with color-blindness or other visual impairments to use the feature. If time permits after the correction of the map feature, it is suggested that the library website also revise the minor usability issues mentioned.

Reflections:

Corey

As mainly a quantitative researcher, I have made it a professional goal to engage in more qualitative type activities to improve my facility in this type of research. I felt that this cognitive
walkthrough provided me with an opportunity to do this. One of the most important benefits I received from this exercise was the interplay between the group members. By having several sets of eyes look at the same topic, different opinions were formed and shared. I was pleased that others had found areas of concern that I had not even considered, and this sharing of ideas made me appreciate the use of the cognitive walkthrough as an evaluative tool.

Deepa

Like Corey I too am mainly a quantitative person who is not comfortable with accepting the findings of a qualitative approach as valid and credible. This term I had other occasions to conduct field observations and interviews apart from IS588. I am still trying to understand and relate to the process of coding, categorizing and thematizing data. Although I was skeptical at first of the effectiveness of the cognitive walkthrough evaluation as a useful tool, the teamwork which allowed a sharing of experience and ideas, has been a meaningful learning experience for me.

The four questions of Wharton were really helpful in thinking about each action thoroughly through the user’s perspective, and finding ‘issues’ which normally I would not have thought about. The team work has also broadened my perspective, since I would never have been able to identify some of the issues by myself. Overall the experience has been extremely useful and I will definitely be thinking about the cognitive walkthrough as an instrument to evaluate some of the technology interventions such as simulations and spreadsheet that we use in our program to enhance learning outcomes.

Sharon

The Cognitive Walkthrough was a difficult concept at first for me to understand in that it may be very subjective if a broad range of users, including those with disabilities and all age
groups, are not taken into consideration for the user group. This was a consideration I had to constantly keep in mind, as this method does not involve actual users since experts make predictions based on what could occur. I enjoyed learning about the newer “Cognitive Walkthrough for the Web” also and see that it can overcome some of this subjectivity. This is possible through breaking down the webpage into sub-regions and focusing on the one which contains the goals or actions needed through selection of the correct “widget” (Blackmon, 2002, 463). I think it would take a lot of experience to become adept at this method, but feel that it could prove very valuable in determining specific interface levels appropriate for a broad range of user groups.

**Janet**

Although I did not complete a cognitive walkthrough, I did have several usability revelations during the course of this project. The first came after reviewing the actions taken by the other group members in the completion of Task 1. I was surprised by the inclusion of the map feature by two of my fellow group members, because this was above and beyond my expectations of the task. This situation reminded me of many other times throughout the semester when we were told that the user will not behave as you expect them to. The cosmetic, minor, and major usability problems uncovered by my group members’ walkthroughs have enlightened me about the value of this usability testing technique. When I designed the tasks, I believed them to be fairly straightforward, and I thought that any problems encountered would be minor. My group mates took to heart the users’ perspective and ensured that any usability issues with the features would be identified and solutions provided.
References


Appendix A

The following 0 to 4 rating scale can be used to rate the severity of usability problems:

0 = I don’t agree that this is a usability problem at all
1 = Cosmetic problem only: need not be fixed unless extra time is available on project
2 = Minor usability problem: fixing this should be given low priority
3 = Major usability problem: important to fix, so should be given high priority
4 = Usability catastrophe: imperative to fix this before product can be released
Appendix B

Task 1:

A user is looking for a book on the University of Tennessee Knoxville Library website. The user is looking for the book *Fire in the Brain: Clinical Tales of Hallucination* by Ronald K. Siegel, and needs to know if the book is available for checkout and where to find the book. Write down the book’s availability and call number on the task instruction sheet.

<table>
<thead>
<tr>
<th>Benchmark Actions</th>
<th>Corey</th>
<th>Deepa Walkthrough 1</th>
<th>Deepa Walkthrough 2</th>
<th>Sharon</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Action</td>
<td>Action</td>
<td>Action</td>
<td>Action</td>
</tr>
<tr>
<td>1.0. 7:20 - Click on the bookmark tab for the UTK Library website.</td>
<td>1.0. 12:20 - Search for “University of Tennessee library” on a browser</td>
<td>1.0. 8:39- Go to lib.utk.edu</td>
<td>1.0. Go back to the homepage by clicking on the logo in the top left-hand corner</td>
<td>1.0. 9:00 Type lib.utk.edu in browser</td>
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<tr>
<td>1.1.</td>
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<tr>
<td></td>
<td>Click on link to UTK library</td>
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<tr>
<td>2.0. Type “fire in the brain” in the “Search for books, journal titles, media, digital collections…” box.</td>
<td>2.0. Copy &amp; paste title and author into search box.</td>
<td>2.0. Copy-paste the title and author into the search box.</td>
<td>2.0. Drop down the ‘Find’ menu in the toolbar at top</td>
<td>2.0. Locate the Main Search Box on the Home Page (about 5 seconds)</td>
</tr>
<tr>
<td>2.1. Hit the Enter key.</td>
<td>2.1. Hit Enter</td>
<td>2.1. Hit Enter</td>
<td>2.1. Click on ‘books and media’</td>
<td>2.1. Copy the title of the book and the author from the assignment page</td>
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<tr>
<td>2.2.</td>
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<tr>
<td>2.3.</td>
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<td>2.3.</td>
<td>2.3.</td>
<td>2.3. Hit Enter</td>
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<td>3.0.</td>
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<td>3.0.</td>
<td>3.0.</td>
<td>3.0.</td>
</tr>
<tr>
<td>Take note of the first result, “Fire in the brain: clinical tales of hallucination.”</td>
<td>12:23 - Info &amp; link to the book is displayed in search results</td>
<td>8:41 - The book title is displayed in the single result</td>
<td>Copy-paste the title and author into the search box.</td>
<td>Read Results and Write down Call Number and Available (about 2-3 min.)</td>
</tr>
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<td>3.1.</td>
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<td>3.1.</td>
<td>3.1.</td>
<td>3.1.</td>
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<tr>
<td>Write down that the book is “Available” in the Hodges Library Stacks</td>
<td>Available - Hodges Library Stacks</td>
<td>Book available in Hodges Library stack.</td>
<td>Hit Enter</td>
<td></td>
</tr>
<tr>
<td>3.2.</td>
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<td>3.2.</td>
<td>3.2.</td>
<td>3.2.</td>
</tr>
<tr>
<td>Write down that the call number is “RC553.H3 S54 1992”</td>
<td>RC553.H3 S54 1992</td>
<td>RC553.H3 S54 1992</td>
<td></td>
<td></td>
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<tr>
<td>4.0.</td>
<td>4.0.</td>
<td>4.0.</td>
<td>4.0.</td>
<td>4.0. Click on “View Map”</td>
</tr>
<tr>
<td>7:21 - END TASK</td>
<td>12:25 - Click on View Map button next to book location</td>
<td>END TASK</td>
<td>Book available in Hodges Library stack.</td>
<td></td>
</tr>
<tr>
<td>4.1.</td>
<td>4.1.</td>
<td>4.1.</td>
<td>4.1.</td>
<td>4.1. Study map to locate elevators and “Orange Pin.” (about 2-3)</td>
</tr>
<tr>
<td>Examine map to pinpoint location on 5th floor of Hodges Library</td>
<td></td>
<td>RC553.H3 S54 1992</td>
<td></td>
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<tr>
<td>4.2.</td>
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<td>4.2.</td>
<td>4.2.</td>
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<tr>
<td>Close map</td>
<td></td>
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<tr>
<td>5.0.</td>
<td>5.0. 12:28 - Click on UT Libraries logo to return to homepage. END TASK</td>
<td>5.0.</td>
<td>5.0. END TASK</td>
<td>5.0. END TASK 9:07</td>
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<tr>
<td></td>
<td>Write down location of book.</td>
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</tbody>
</table>
Appendix C

Task 2:
A user is interested in bird watching and wants to know if the University of Tennessee Knoxville Library website has any bird related resources. Find a database about North American Birds. Write the name of the database on the task instruction sheet.

<table>
<thead>
<tr>
<th>Benchmark Actions</th>
<th>Corey</th>
<th>Deepa</th>
<th>Sharon</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1.0. 7:50 - Click on the back button to return to the UTK Library homepage.</td>
<td>1.0. 12:40 - Search for “University of Tennessee library” on a browser</td>
<td>1.0. Go to lib.utk.edu</td>
<td>1.0. 9:15 Typed lib.utk.edu into browser again since no Home button or icon to choose from</td>
</tr>
<tr>
<td>1.1. Click on link to UTK library</td>
<td>1.1. Click on link to UTK library</td>
<td>1.1.</td>
<td>1.1.</td>
</tr>
<tr>
<td>2.0. Select “Articles and Databases” under the main search box.</td>
<td>2.0. Click on “Articles &amp; Databases” under Search box</td>
<td>2.0. Click on articles and databases below search box.</td>
<td>2.0. Click on articles and databases below the Main Search Box</td>
</tr>
<tr>
<td>3.0. Select “Biology” under the “By Subject” header.</td>
<td>3.0. Under “By Subject,” click on Biology link</td>
<td>3.0. Click on ‘biology’ under ‘by subject’</td>
<td>3.0. Click on “Complete List of Databases,” the first option below the Search in Databases</td>
</tr>
<tr>
<td>3.2.</td>
<td>3.2.</td>
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<td>3.2.</td>
</tr>
<tr>
<td>Find <em>Birds of North America Online</em>.</td>
<td>“Birds of North America Online” database 11th link down the page</td>
<td>Find ‘birds of north america online’</td>
<td>9:18 Found database “Birds of North America” (scanning about 1 to 1 ½ minutes)</td>
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<tr>
<td>3.3. 7:52 - Wrote down database name</td>
<td>3.3. Click on link</td>
<td>3.3. Click on it</td>
<td>3.3. Write down “Birds of North America”</td>
</tr>
<tr>
<td>3.4. END TASK</td>
<td>3.4. 12:44 - Homepage <a href="http://bna.birds.cornell.edu.proxy.lib.utk.edu:90/bna/">http://bna.birds.cornell.edu.proxy.lib.utk.edu:90/bna/</a></td>
<td>3.4. Find the home page of the database: birds of north america online.</td>
<td>3.4. END TASK</td>
</tr>
<tr>
<td>3.5.</td>
<td>3.5. END TASK</td>
<td>3.5. END TASK</td>
<td>3.5.</td>
</tr>
</tbody>
</table>