Nathalie S. Baudrand. Usability Testing of the North Carolina Digital Heritage Center's Website, DigitalNC.org. A Master's Paper for the M.S. in I.S degree. July, 2013. 34 pages. Advisor: Ryan Shaw

The North Carolina Digital Heritage Center's website, DigitalNC.org, has provided access to digitized cultural heritage materials from many small North Carolinian museums and libraries since its inception in 2003. The current website has been in use since that time, and is in sore need of usability analysis prior to a major redesign effort. The current DigitalNC.org site design is the only way for contributing institutions and researchers to access the digitized materials online, making access and use of the website via its design of paramount importance to the NCDHC's mission. No data has been collected about the usability of the site thus far.

This usability study will help to collect data to inform a user-centered redesign of the current DigitalNC.org site. Furthermore, data collected will provide quantitative information to help create a hierarchy of priority for any perceived issues with the current interface. This study was designed using guidelines developed by Jakob Nielsen and Steve Krug. The guidelines developed by these two usability experts were used in this case because they are intended to be implemented in instances when usability testing needs to be inexpensive, iterative, and lean.

Headings:

Human-computer interaction

User interfaces (Computer systems)

Usability Engineering (System Design)

Usability Testing of the North Carolina Digital Heritage Center's Website, DigitalNC.org

by
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Approved by

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Usability Testing of the North Carolina Digital Heritage Center's Website, DigitalNC.org

In the summer of 2013, the North Carolina Digital Heritage Center conducted usability testing of its website, DigitalNC.org. The study focused on seven common tasks for website users and was focused around testing the current navigational system from the home page as well as testing whether the language used in the home page was overly specific or misleading.

Participants were asked to complete the following tasks:

1. Where might you find digitized newspapers on the site?

2. How would you find a newspaper or newspapers from 1900?

3. You would like to locate materials from Kings Mountain, NC from the early 20th century. How would you look for these items?

4. You want to find out if materials from your local library, the Forsyth County Public Library are hosted on DigitalNC.org. How would you find this information?

5. You are interested in finding some information about a relative, Helen Gladys Davies, who went to Saint Mary's School in 1903. How would you try to find information about Helen Davies?

6. You are interested in wedding clothing from the first part of the 1900s. Can you find anything that matches your interest?

7. You want to see if DigitalNC.org has any images of bookmobiles. How might you find this information?

Participant performance and feedback illuminated a number of usability issues with specific areas of the site. Recommendations based on the test results include the following:

1. The newspapers collection page should have only one access point from the home page.
2. The "all newspapers" page, when viewed in the CONTENTdm interface, needs a visible sort by date facet next to the other facets.
3. Either rename "items by type" option on the homepage to items by format or remove "items by type" altogether.
4. Make all subject terms visible on the Images of North Carolina collection page.
5. Include "sort by date" facet in "view all by type" pages.
6. Increase visibility of advanced search button on collection home pages.
7. Make a separate subpage accessible from the home page for exhibits and slide shows.
8. Move navigation buttons on the yearbook-viewing interface to the top of the page.
9. On homepage, change "Counties" menu button to "Location." Within page, include options for viewing items by county, town, or city.

Background Statement

The North Carolina Digital Heritage Center (NCDHC) is a state-funded digital library and archive operating out of Wilson Library at UNC Chapel Hill. The NCDHC offers digitization services for cultural heritage institutions in North Carolina who may not have

the time or equipment available to digitize their own resources. The NCDHC provides access to partner institutions digitized resources via the NCDHC website, DigitalNC.org, which allows the participating institutions to then provide links to the digitized materials via their own websites.

The NCDHC is planning a site redesign for summer 2013. Prior to expending the time and energy on redesigning their existing site, the NCDHC would like to conduct usability testing to help inform the site redesign. The NCDHC would like to test a small group of users specifically from the perspectives that many of the site's actual users come from: archivists, librarians, genealogists, alumni, and students. The usability testing will help illuminate a hierarchy of need for the site redesign, which will allow the NCDHC to better allocate resources to the most essential changes.

The results of usability testing are gleaned from observing users interacting with a given site and from observing their efforts at completing given tasks. In usability testing, the ideal number of participants is between five and eight people. Results from five to eight tests would not produce statistically relevant results, but are on par with the highest return on investment; the report "How Many Users in a Usability Study" out of the Nielsen Norman Group by Jakob Nielsen (2012) shows the diminishing returns from larger test groups.

Usability testing is an important part of the web design process as well as an essential element of user experience design. Usability testing connects a representative sample of users with the product being produced to determine whether or not the product, be it a website, software design, or sundry item makes sense to the population who will be interacting with or purchasing the product. Web usability testing in particular is

important to many agile design processes, because, as Krug notes, it is most effective when used iteratively during the entire design process (p. 135). For the purposes of this project, usability testing will occur only on a previously existing website. This paper will focus on the first round of testing due to time constraints, but additional rounds of usability testing will occur before the site redesign will be considered complete.

The research will be performed to help the NCDHC gain a better understanding of issues users have when interacting with DigitalNC.org. Because the website is fairly specialized – it provides access to digitized materials from North Carolina cultural heritage institutions – the NCDHC is unclear about where the balance between specialized vocabulary native to a library or archive and more colloquial terminology should be used. Finally, the NCDHC is interested in understanding how users move through the site using the current navigation bars and menus. The results of the usability testing will be used to help assess the need to change and update the navigation bars and menus and develop navigation menu and navigation structure updates.

Literature Review

What is usability?

The Nielsen Norman Group published an article by Jakob Nielsen (2012) that defines usability by saying that "Usability is a quality attribute that assesses how easy user interfaces are to use. According to a 2012 report titled "Usability 101: Introduction to Usability" by Jakob Nielsen, the word "usability" also refers to methods for improving ease-of-use during the design process." Usability testing is preformed to provide a scaffolding of quantitative data before an organization commits the time and capital necessary to undergo redesigning an existing website.

Why Redesign?

While the current design of DigtalNC.org is not poor, staff at the NCDHC have noticed that even they have some difficulty navigating the website in its current incarnation. The benefits of good design are visible in the productivity of users and the increased ability of users to achieve various tasks. Good interaction design helps users move intuitively through an interface and helps to keep users from becoming frustrated during the course of their interaction with the site. In *The Essential Guide to User Interface Design*, Galitz (2007) puts the benefits of good design in terms of processing time per screen; for example, "poor clarity forced screen users to spend one extra second per screen, almost one additional person-year would be required to process all screens" (p. 7). Because the NCDHC is interested in providing a positive experience for the organization's users, they are determined to ensure that the redesign allows for the best flow through the site and more importantly, the best access to the collected materials.

Research and Theory

To summarize Mayhew (1999), the first part of developing a usability test is performing a requirements analysis; the requirements analysis includes performing steps such as building a user profile, performing contextual task analysis, setting usability goals, and understanding platform capabilities and constraints (p. 7). The user profile is essential to defining characteristics of users that may be important to the design of the interface. Mayhew goes on to articulate that defining the user also helps to define who users are so that the usability testing team can better develop testing tasks (p. 6). In *Library Technology and User Services*, Chow and Bucknall (2012) define the needs assessment as a four step process – "determine whose need actually should be identified; assess the

need by communicating with each constituency group using multiple methods; collect statistics around existing resources and usage patterns (i.e. circulation history, computer usage, etc.); analyze the results and create a priority list of each group's goals" (p. 16). Chow and Bucknall go on to further say that the strategic plan for usability testing should have five major components, "a mission statement, a vision statement, organizational values, core competencies, and priority organizational goals and objectives" (p. 21).

Both the Mayhew text and the Chow and Bucknall text mention the development of personas as an essential portion of the usability engineering lifecycle. Developing personas facilitates the design of the actual research questions, and allows the study design team to think creatively about the kinds of tasks that representative users may be interested in accomplishing.

Research Questions

1. How can the NCDHC make its website more intuitive to users?

2. What breakdowns in interactions with the website most frequently cause task failures?

3. What design changes would have the highest return on investment for the NCDHC?

Methodology: How did you do it?

The methodology for the study used guidelines from *The Usability Engineering Lifecycle* to help create guidelines for this study. The book outlines two major segments of developing in the usability engineering lifecycle. The first of these is the requirements analysis, which includes creating user profiles, setting usability goals, and discussing platform capabilities and constraints. The half of the usability engineering lifecycle is the

design, testing, and development phase which includes creating conceptual models and gathering user feedback.

In following Mayhew's methods (1999), a meeting between staff was called to discuss areas of concern with the site and known issues. During this meeting, an initial needs assessment was performed to determine what areas of the site the staff at the NCDHC were most interested in learning about through usability testing.

In particular, the staff at the NCDHC decided that they wanted to determine how many issues users potentially have with the site stem from basic information literacy problems versus problems with the actual design of the site. The staff discussed who the audience is for the materials published on the site, and then, based on that audience, the staff discussed representative tasks that would be a good gauge of whether or not materials on DigitalNC.org were easy to find and use. In this meeting, staff members also defined known problem areas, such as the search function on the site.[1]

After the initial needs assessment was conducted, personas were developed around the NCHDC's known audience. Personas included a public librarian, a history student, a genealogist, and a school alumnus. Proficiencies and breakdowns were defined for these particular personas to help better inform task creation for the usability test. Within the personas, strengths and weaknesses were described as well as use cases that the persona might be most interested in completing using DigitalNC.org. Personas were

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[1] The search function on the site does not work consistently because of an issue specific to CONTENTdm the content management system that digitalnc.org relies upon to upload and manage materials. CONTENTdm's search function has a scalability problem related to the NCDHC's use of the CONTENTdm software. Because NCDHC is a power user of the software, CONTENTdm is often stretched to the limits of its capabilities, which results in some issues with scaling which affect search. For example, search queries are only allowed to run for a specific time. This time is affected by a multitude of variable such as the speed of the users Internet connection and how many people are visiting the site currently. For these reasons, search was left out of the scope of the study. Staff members at the NCDHC are working with OCLC to resolve the bugs currently.

created by consulting with senior staff members at the NCDHC about who the known audience for the site is. Due to time and resource constraints; focus groups were not used to develop personas. Using the personas as guides, testing tasks were developed to help emulate the kind of interactions that a variety of users might have with the site (see figures 1 through 5). Before testing began, idealized interaction models were developed to show how an expert user would approach the tasks (see figures 8 and 9).

Testing tasks were designed to begin with a very easy question and progress to more challenging questions. To keep the test from running over an hour as well as providing ample time for any questions and discussion before and after the test, only seven testing tasks were created. Ideal interactions were defined to helps create a benchmark for how an expert user might proceed to complete each task. Test participants were given five minutes maximum to complete each task, which resulted in a maximum of 35 minutes of active testing time and 25 minutes of time devoted to reading the testing script, discussing and signing consent forms, answering survey questions, and responding to any other questions or concerns that the participants may have had. Participants were asked to think aloud during their interactions with the site, and their click streams and mouse movements were captured using Camtasia software. A failed task was defined as any task that took more than 3:30 minutes, but users were given five minutes total to complete each task. The extra time after the failure point allowed participants to continue working through the task, which provided additional data for the study.

Before beginning the testing session, participants responded to a pre-test survey that collected demographic data as well as information on participants' self-reported general interest in cultural heritage materials, facility with computers, and interest in

digital libraries. Testing tasks were displayed using a survey designed in the University of North Carolina, Chapel Hill's Qualtrics application.

First, the testing task would appear to prompt the participant to begin a task. Once the task was completed, participants were asked to respond to questions about the relative ease or difficulty of completing a particular task and then were asked additionally to describe what aspects of the completing the task they found confusing or what areas they saw for improvement. After all tasks were completed, participants were asked to complete a post-test survey which collected data on their general attitude towards their experience with the website. Finally, each participant responded to a survey with questions from the System Usability Scale.[2] Participants were offered $20 for taking the test.

After each testing session ended and the participant left, the researcher reviewed the researcher reviewed the video and took additional notes on the user's interactions during tasks that took longer than 3:30 minutes. Particular care was given to tasks that participants failed to complete within the five-minute time limit.

Interaction models were made for failed tasks where useful, and show breakdowns in the interaction that caused the task to be unsuccessful. Recommendations based on the observed interactions in the form of a usability report complete the testing phase. Iterative testing will be done by the NCDHC, but is beyond the scope of this paper and the first iteration of the design.

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[2] Brooke, 1996

Usability Test Design

Needs Assessment: What do we need to do?

Chow and Bucknall's text, *Library Technology and User Services*, states that the elements of a needs assessment should be as follows: "Determine whose need should be identified; Asses the need by communicating with each constituency group using multiple methods; Collect statistics around existing resources and usage patterns; Analyze the results and create a priority list of each group's goals" (p. 16). Time constraints prevented the development of a focus group for the usability testing. Instead, the NCDHC chose to practice a leaner model of usability testing, as championed by Steve Krug in *Don't Make Me Think: A Common Sense Approach to Web Usability*.

Personas and Use Cases: For whom are we designing?

Personas were developed in accordance with methods for persona development suggested by Caddick and Cable(p. 14-15). Caddick and Cable's model for developing personas includes stating key goals, behaviors, "must dos" and "must nevers" for each persona. The first persona, the public librarian, was described as a small town public librarian at a contributing institution.

Public Librarian Persona
Occupation: Small town public librarian at a contributing institution Key Goals: 　-　Find materials for patron use in a timely manner, but thoroughly. 　-　Needs to have a good understanding of how the site works so she can show people/teach patrons to use it. Behaviors: 　-　Determined to find relevant materials. Will continue to search when others would have given up

- familiarity with archives/libraries: Very familiar, MLS holder.
- Willing to pursue lots of different avenues.
- Comfortable using facets and advanced search
- Good a formulating search terms and using advanced search functions.

We Must:
- Make sure that she can apply her library-specific knowledge in a way that makes sense but also not confuse less library-centric users
- Make paths to items easy to find and fairly searchable
- Make sure that she knows how to find materials from her library.

We Must Never:
- Leave dates off
- Prevent search using date or location.

USE CASES:
- Searching for something for a patron; examples of X document from X time period.
- Probably searching by subject terms.
- Using digitalnc.org to provide access to her libraries' collections, may need to use the by contributors page to find documents.

Figure 1.

Hobby Genealogist Persona

Key Goals:
- Find information about relatives.
- Site needs to be intuitive enough that he can find resources that may be helpful to him.

Behaviors:
- Will patiently sift through pages and pages of images searching for something, but is not particularly tech savvy.
- Has been doing genealogy for a while, somewhat familiar with archives/library related vocabulary.
- Comfortable using email and Google. May be somewhat overconfident with using the web for research.
- Not comfortable using facets or advanced search.

We Must:
- Make sure that we use clear language
- Make categories of materials and locations very visible

We Must Never:
- Make something overly technical
- Make buttons so small that he cannot see or read them.

Use Case:
- Keyword searching by town name, by ancestor name.

- Searching through ledgers or city directories from a particular location. - Relies on OCR a lot as well as location data based on town name. - Searches by type of document looking for ledgers and other information with a particular name.

Figure 2.

Graduate student in History Persona

Occupation: Graduate Student in History at UNC Chapel Hill
Age: 25 Sex: F
Key Goals:
   - Finding materials for her own research in a faster way than actually going to an archives
   - Interested in collections around a historical event and likes ready-created exhibits.
 	
Behaviors:
   - Not particularly patient with her searches. If something useful doesn't show up with the first few searches, she assumes that it isn't there.
   - Fairly tech savvy, uses the internet for lots of things, including online shopping, social media, entertainment, email, and school work.
   - Understands advanced search and using facets
 	
We Must:
-     Make sure that there are clear paths to the materials.
-     Provide facets and other ways of narrowing a search
 	
We Must Never:
-     Leave dates out of displayed information
-     Use ambiguous language when describing collections
-     Prevent her from doing a search using facets.

Use case:
   - Searching for specific dates of historical events using subject terms.
   - Keyword searches for specific events in Newspapers.
   - Looks through the collections trying to find an online exhibit of related materials.

Figure 4.

School Alumnus Persona

Age: 55 Sex: M
 	
Key Goals:
   - Mostly interested in finding images for alumni events.
   - Nostalgic searches mainly. Primarily interested in yearbooks and campus publications.
 	
Behaviors:

- Does more browsing than active searching – partially interested for entertainment and partially interested because of relationship to school.
- Not particularly familiar with archives/digital libraries.
- Not comfortable using facets. Not quite sure how advanced search works.

We Must:
- Make sure that yearbooks are accessible
- Make sure that it's easy to sort by school and year.

We Must Never:
- Make it easier to go straight to the CONTENTdm interface than going to a particular collection.

Interested in finding his old yearbooks to share with others.

- Motivated amateur mostly interested in finding pictures of particular groups to use for alum events.
- Interested in finding pictures of old friends.
- Mostly searches for things that remind him of his college days at UNC-Chapel Hill in the late 1970s.

Figure 5.

Participant Backgrounds: Who was actually tested?

Test participants reported ages between 22 and 56 years. Of the eight participants, two were male and 6 were female. Two of the eight participants are PhD candidates in history, two of the participants work as librarians, one participant is a digitization workflow technician, one participant works in research and instruction in a library setting, one participant works in an archive, and one participant works as a genealogist at a small public library. Participants had all been using the Internet for at least 10 years, and all participants reported that they used the Internet many times a day. On average, the eight participants reported that they spent between three and nine hours on the Internet each day. All participants had previous experience accessing cultural heritage materials on the web, and most had used the DigitalNC.org website two times or less.

Participant #	Age	Occupation
Participant 1	23	Research and Instruction, Graduate Assistant

Participant 2	22	University Archives, Graduate Assistant
Participant 3	28	Digitization Workflow Technician
Participant 4	35	Librarian
Participant 5	28	PhD candidate in History.
Participant 6	34	PhD candidate in History. History Department Teaching Assistant
Participant 7	26	Graduate Student, Digital Initiatives Librarian.
Participant 8	56	Librarian Assistant and Genealogist

Figure 6. Participant demographics.

Representative Tasks and Survey Questions: What questions were asked?

Tasks were developed based on personas as well as based on discussion with staff members at the North Carolina Digital Heritage Center. Before any tasks were given, users were asked to spend three minutes exploring the site. During this time, users were asked to think out loud about where they were going and why they were choosing the click on the things that they clicked on.

All tasks were designed to emulate realistic interactions with the site. The tasks became more difficult as the test moved forward. The first two testing tasks were designed to be very simple, with the expectation that it would help participants familiarize themselves with the site to a small degree. Additional tasks were made more difficult as the test progressed. Though not listed for the sake of brevity, each task after task one features identical questions regarding the degree of facility or difficulty the participant experienced and what aspects, if any, they might suggest for improvement. If users responded "yes" to whether the task could have been easier, they were taken to subsequent questions which asked participants to elaborate on what could have been easier as well as what sections of the task they found confusing.

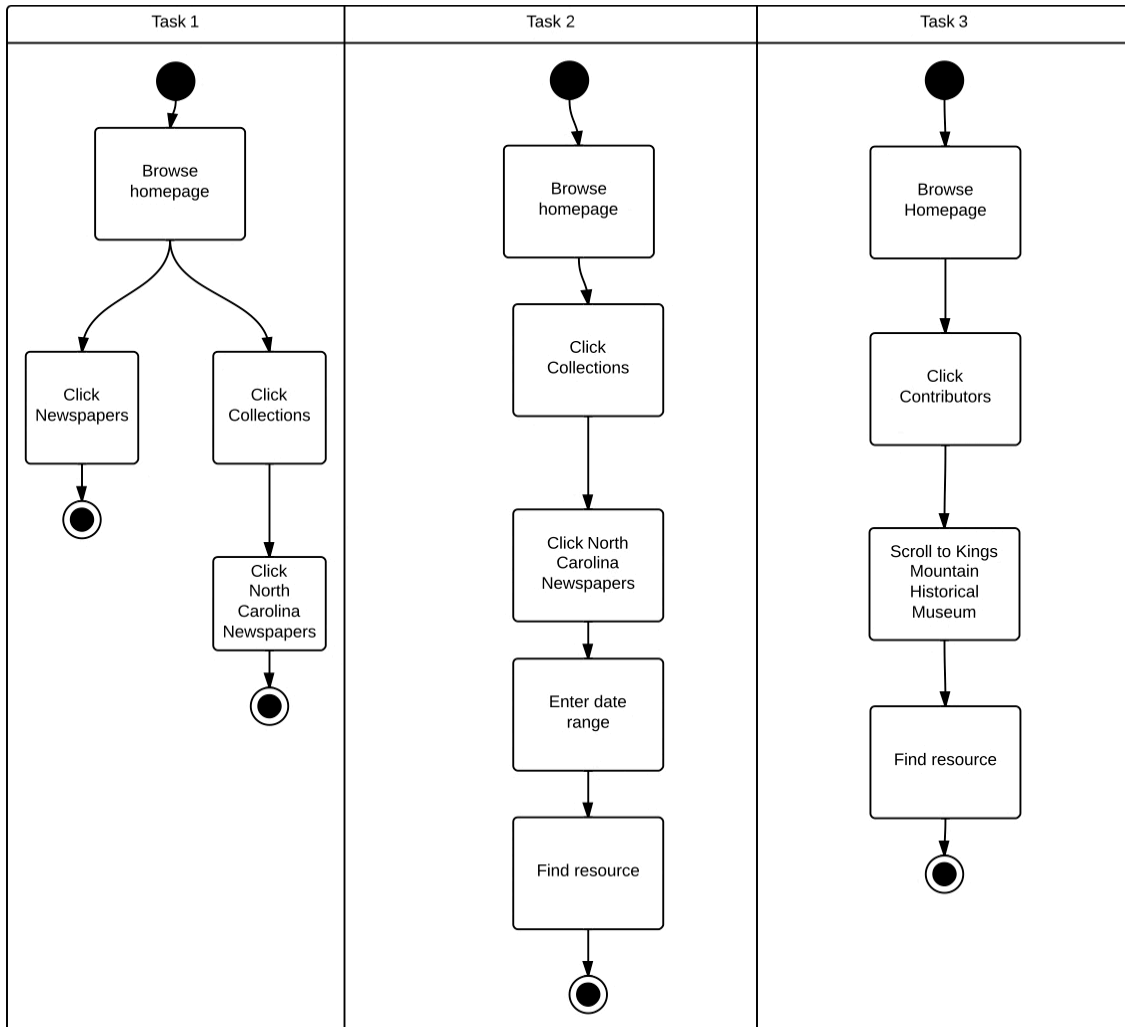| |
|---|
| First, spend 2 minutes exploring the site. Please remember to "think out loud." |
| Task 1: Where might you find digitized newspapers on the site?
Task 1.1: Rate how easy or difficult you found this task:
Task 1.2: Could task 1 have been easier?
Task 1.3: How could finding this information have been easier?
Task 1.4: What, if anything, was confusing about finding this information? |
| Task 2: How would you find newspapers or a newspaper from 1900? |
| Task 3: You would like to locate materials from Kings Moutain, NC from the early 20th Century (between 1900 and 1930). How would you look for these items? |
| Task 4: You want to find out if materials from your local library, the Forsyth County Public Library, are hosted on DigitalNC.org. How would you find this information? |
| Task 5: You are interested in finding some information about a relative, Helen Gladys Davies, who went to St. Mary's School in 1903. How would you try to find information about Helen Davies? |
| Task 6: You are interested in wedding clothing from the first part of the 1900s. Can you find anything that matches your interest? |
| Task 7: You want to see if DigitalNC.org has any images of bookmobiles. How might you find this? |

Figure 7. List of testing tasks.

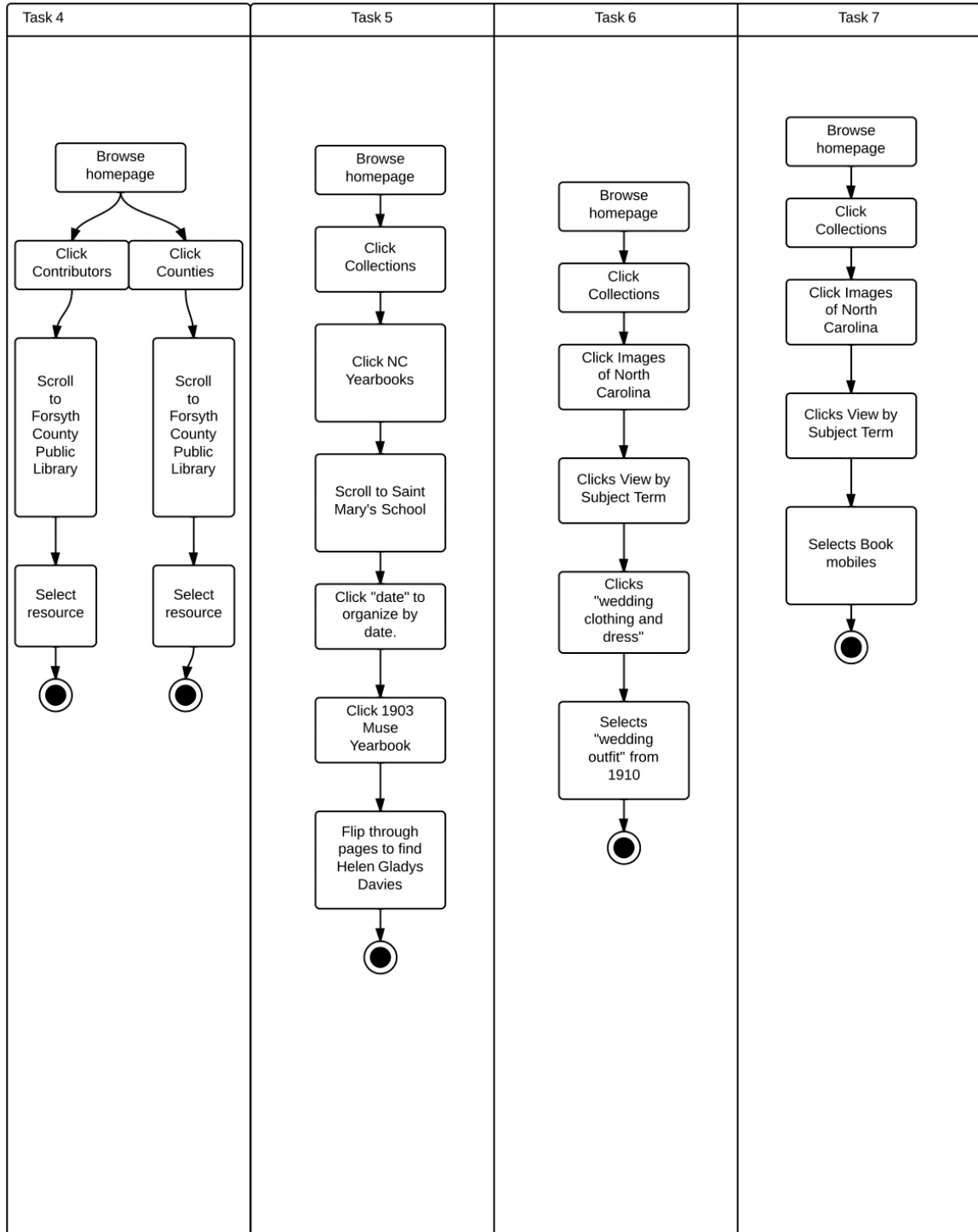Figure 8. Ideal interaction model for tasks 1, 2, and 3.

Task 4	Task 5	Task 6	Task 7

Task 4

Browse homepage
→ Click Contributors / Click Counties

Click Contributors → Scroll to Forsyth County Public Library → Select resource → ●

Click Counties → Scroll to Forsyth County Public Library → Select resource → ●

Task 5

Browse homepage → Click Collections → Click NC Yearbooks → Scroll to Saint Mary's School → Click "date" to organize by date. → Click 1903 Muse Yearbook → Flip through pages to find Helen Gladys Davies → ●

Task 6

Browse homepage → Click Collections → Click Images of North Carolina → Clicks View by Subject Term → Clicks "wedding clothing and dress" → Selects "wedding outfit" from 1910 → ●

Task 7

Browse homepage → Click Collections → Click Images of North Carolina → Clicks View by Subject Term → Selects Book mobiles → ●

Figure 9. Ideal interaction models for tasks 4, 5, 6, and 7.

Data Collection and Analysis: What was found?

Task 1

Where might you find digitized newspapers on the site?

None of the eight users reported having any difficulty with task 1, which was designed to allow the users at least one very easy task to help build confidence and ease tension at the beginning of the test. On average, this task took participants 12 seconds to complete.

Task 2

How would you find newspapers or a newspaper from 1900?

Task two, however, which was designed to be the second easiest task in the set, proved challenging to some users. Two of the eight participants actually failed to complete the task within the set five-minute time limit. The issue arose from ambiguity regarding what navigation button would lead users to the newspapers collection page. The screen shot in Figure 10 illustrates the initial problem with task two. Clicking on "North Carolina Newspapers," indicated by the red arrow in Figure 10, takes users to the North Carolina Newspapers homepage, which allows users to select a date range immediately. If the user clicked instead on "Newspapers," indicated by the blue arrow in Figure 11, then they would be taken immediately to the CONTENTdm supported page of all available newspapers and entirely skip the newspaper collection page. The CONTENTdm interface is somewhat beyond the control of the NCDHC because it is part of an "out of the box" content management system and some aspects are not easily customizable by the available staff.

Participants who had difficulty with task two *always* missed the North Carolina Newspapers button in the menu beneath the Collections button on the home page and

went straight to the "Newspapers" under the "Items by Type" Newspapers button on the homepage. Additionally, Figure 12 illustrates the problems with searching by date in the CONTENTdm interface. Four out of eight of the participants clicked on "Newspapers" under "Item by Type" (referenced by the blue arrow) as opposed to "North Carolina Newspapers" under the "Collections" tab. That half of the participants missed the collection page and went straight to "Newspapers" is a serious problem. Clicking on "Newspapers" results in users being brought to a page with 25,233 results – a completely overwhelming number for all participants who found themselves on this page.

The issues with the redundant and misleading newspapers buttons are a serious issue and should be prioritized in the redesign of the site. One frustrated user commented in regard to this task, "Date facet! Also auto-sorting newspapers by date? Definitely making the advanced search by date option less opaque." Users who missed the newspapers collection page usually realized that they could click "date" (in the yellow box in figure 12) to sort the items by date. The difficulty came because there was then no obvious way to get to the desired date. Of the four users who missed the newspapers collection page and went straight to all digitized newspapers under item by type, only one user saw and used advanced search to display only newspapers from 1900.

A second recommendation for this feature is the addition of a date facet to be added to the area delineated by the red box in figure 12. The breakdown in task two is illustrated by figure 13. On average, this task took participants 1 minute and 49 seconds to complete.
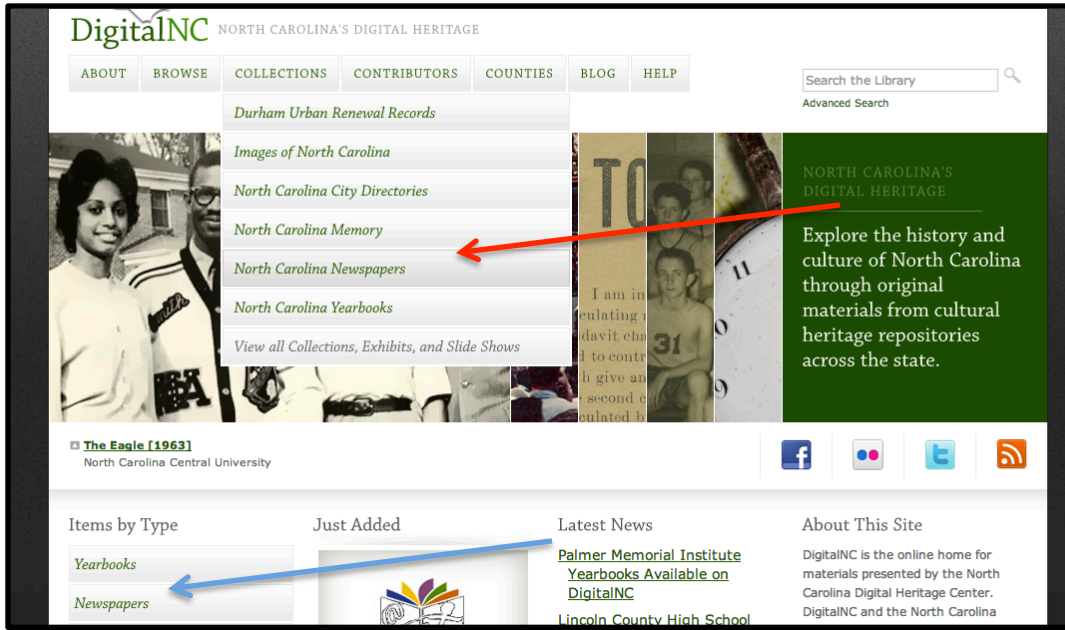
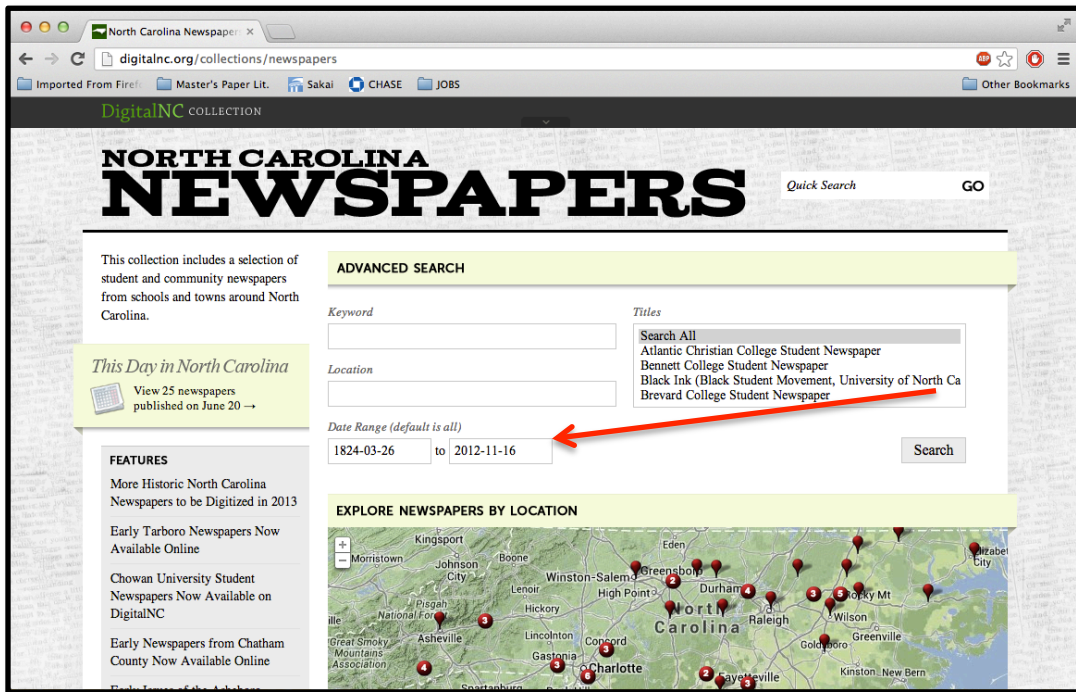Figure 10. Screen capture of digitalnc.org home page.

Figure 11. North Carolina Newspapers collection page.
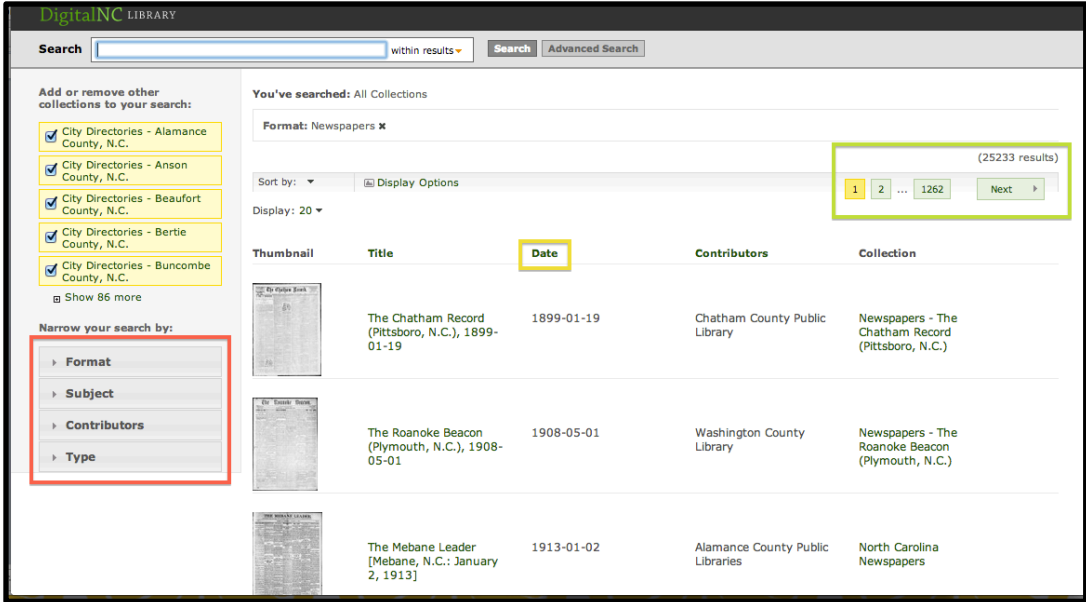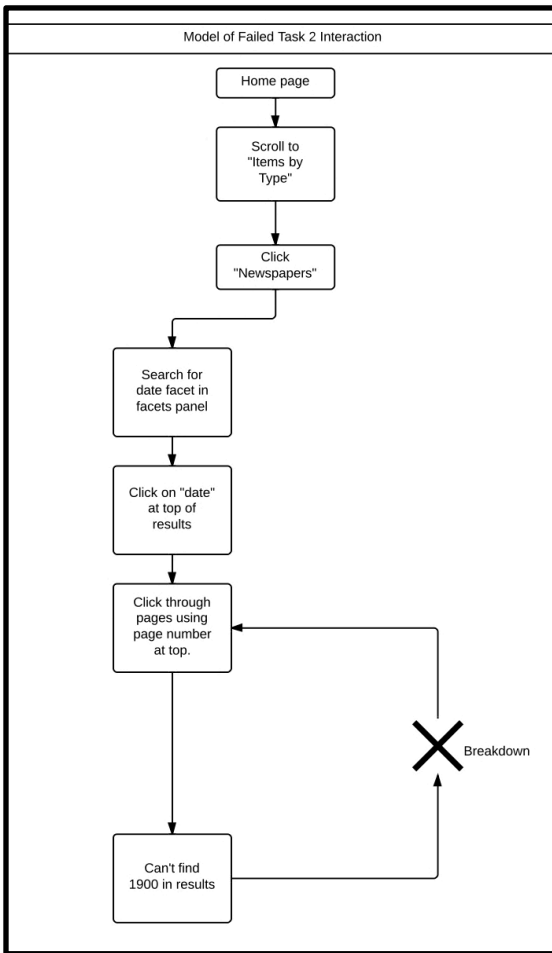
Figure 12. Items by Type > Newspapers.

Figure 13. Task 2 breakdown.

Task 3

You would like to locate materials from Kings Mountain, NC from the early 20th Century (between 1900 and 1930). How would you look for these items?

While no participants failed to complete this task, three of eight participants felt that the task could have been easier to complete. Participants cited reasons such as "Browsing by counties is a higher hierarchical location in the menu than browsing by location (which is really browsing by geographic subject heading). Or at least grouping those two browsing options together instead of way separated on the menu," and "List of towns?" as ways that the task could have been easier. More important than these comments, however, were the actual paths that participants to took to find this material. Participants scrolled through the top menu bar searching for some kind of location option and settled on "Contributors" because they did not know what county Kings Mountain was in. This problem is of mid-priority.

Because of confusion about where to begin looking for materials from a particular place, the redesign may benefit from having a locations menu option on the home page instead of only either counties or contributors. Within the locations page, users could select town name, city name, or county and then look through an alphabetized list like the ones featured on other pages of the site currently. On average, this task took participants 1 minutes and 41 seconds to complete.

Task 4

You want to find out if materials from your local library, the Forsyth County Public Library, are hosted on DigitalNC.org. How would you find this information?

All of the participants were able to complete task four with no problems. The contributors menu option was easy to find at the top of the home page. All eight participants followed one of the two ideal interactions for this task. Because all participants were able to

accomplish this task with ease, there are no recommended design changes. On average, this task took participants 51 seconds.

Task 5
You are interested in finding some information about a relative, Helen Gladys Davies, who went to St. Mary's School in 1903. How would you try to find information about Helen Davies?

Four of eight participants said that this task could have been easier. One frequently cited reason was that the digitized yearbooks were not text searchable. Outside of this, however, participants were all able to complete this task. The main issues with this task included the interface for viewing the digitized yearbooks because the buttons for navigating the interface were "below the fold" on the laptop on which participants were tested. Because the zoom and page turn functions were below the fold, some participants did not see how the way to interact with the digitized yearbook, and instead used the "play" button at the top of the interface, which turns each page in the book slowly. Figure 15 illustrates the issue with the navigation bar. Moving the navigation buttons to the top of the yearbook viewing interface would alleviate this problem and not be as susceptible to being overlooked because of screen size.

Because all participants were able to complete the task, changes are not essential, but putting the forward, back, and zoom buttons at the top of the viewing screen would greatly improve the user experience because the navigation buttons would be much more obvious to users. This task took the participants an average of 2 minutes and 53 seconds to complete. Most of the time spent completing this task went towards flipping through the pages of the yearbook in search of the name, "Helen Gladys Davies."
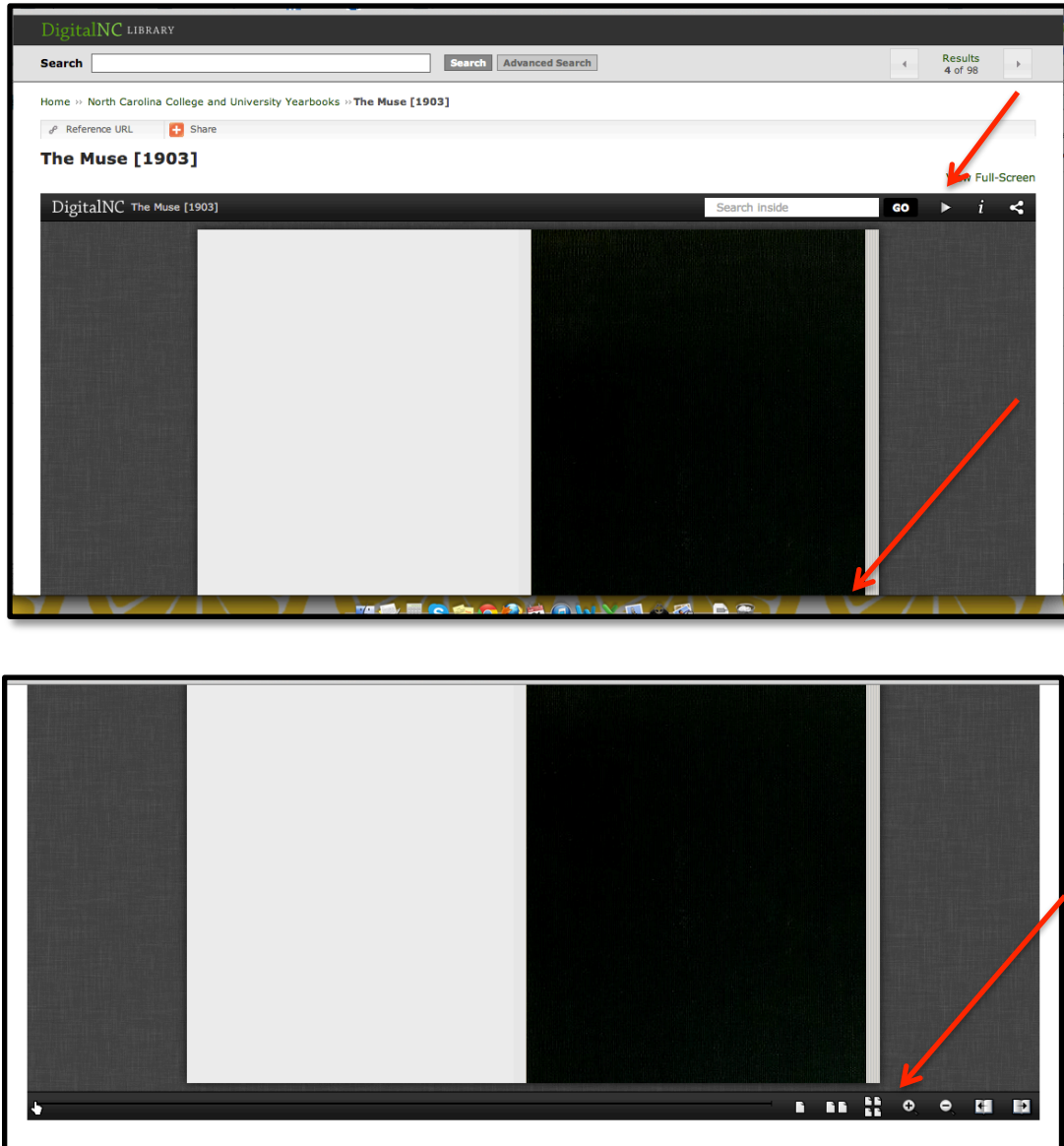
Figure 14. First page view of yearbook viewing interface, with the image at the top displaying how users first see the yearbook interface and the image at the bottom showing the interface controls that were initially hidden beneath the fold.

Task 6

You are interested in wedding clothing from the first part of the 1900s. Can you find anything that matches your interest?

Of the eight participants tested, seven were able to successfully complete task six. While participants were able to find an item that matched the search task eventually, this task took participants an average of 2 minutes and 57 seconds to complete. Of all the tasks,

participants in general found completing this task most difficult. The problem with this task was that participants were not sure what "Items By Type" meant on the home page. "Items by type" refers to format, not subject term or some other point that might indicate the content of the object. One participant who tried to find an image of wedding clothes found it frustrating that she could not narrow the results for the type "photograph" by date. Four of the eight participants followed the ideal interaction model for task 6, but another four of the eight participants began their search elsewhere and eventually looped back to images to complete the task, which indicates that many users may not know where to start looking for something so subject specific. Part of the problem was that it was difficult for participants to find where subject terms were listed on the site. Making subject terms always visible in the Images of North Carolina collection page would correct this issue.

Another problem participants had completing this task was that even if participants went to "Items by Type," they skipped over the type "clothing" (which would have led them to the correct materials), and used the back button to navigate to the "Images of North Carolina Collection" where they were able to go search by subject term for "wedding clothing," or "weddings."

Task 7
You want to see if DigitalNC.org has any images of bookmobiles. How might you find this?

Two of the eight participants were unable to complete this task. The problem was again with "Items By Type" option under the "Browse" tab on the homepage. Participants were looking for subject terms when they clicked "Items By Type," and were frustrated when

"Items By Type" displayed formats. Three participants followed the ideal interaction model until they arrived at the "Images of North Carolina" collection page. At this point, they did not see the "View Subject Terms by Name" link at the top of the page, and instead were confused to see only contributor names and counties listed. When a user clicks on "View Subject Terms by Name," the subject terms appear to the right of the page. Keeping subject terms visible on the "Images of North Carolina" collection page at all times would prevent this particular problem, and would not alter the information currently present. Figures 15 and 16 show the "Images of North Carolina" collection page before and after "View Subject Terms by Name" is clicked. The exhibit slide show could be moved to another location within the site that would be specific to exhibits created by NCDHC staff members.
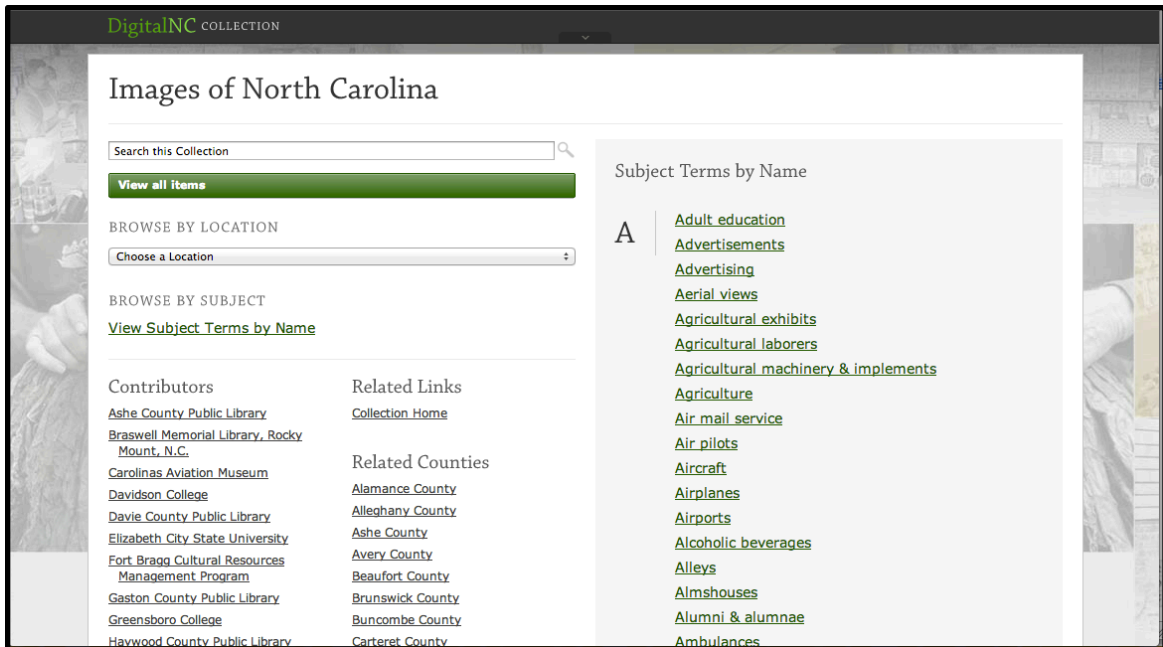

Figure 15.

Figure 16.

System Usability Scale Results

The system usability scale was developed as a "quick-and-dirty" metric used to measure the general usability of a particular system by J. Brook in 1996. The system usability scale is a ten-item Likert scale and provides a subjective view of the usability of a particular system. The overall System Usability Scale score for DigitalNC.org is 85.71 out of 100. The 68 out of 100 is the benchmark for an average score. DigitalNC.org's score is above average, and reflects a positive over all user experience with the site.

Conclusions

The results of the testing indicate that there is some room for improvement in the current site design, primarily in areas such as the home page navigation menu and the accessibility of subject terms for search need to be rethought. Overall, participant attitudes towards the site were very positive. The overall design of the site was rated highly by participants, with an average score of 4.5 out of 5, with 5 being best and 1

being the worst. Overall, participants were able to complete the tasks. Of the 56 tasks

completed by the eight participants, 12 tasks resulted in failure. In other words, 78.6% of

the tasks were successfully completed.

The DigitalNC.org website is strong overall, but could use a few minor tweaks, as

mentioned in the executive summary. The application of these changes would

significantly improve the user experience of the website and help streamline the process

of completing tasks related to the most commonly accessed materials on the site.

Areas of DigitalNC.org that could use further investigation include tasks that ask users to

find and use city directories, find and view exhibits, or re-testing the new design using

the same tasks to see if the changes made effectively solve problems uncovered in the

first iteration of the study.

Discussion

Of course, additional testing would reveal additional areas for improvement, but the time

constraints and focus on the testing limited this particular iteration of the study to only a

few interest areas. Given additional time and resources, the study could have surely

benefitted from additional iterations of testing and the use of focus groups and interviews

with additional stakeholders to better develop a needs assessment. Additional limitations

could have come from circumstances specific to the set up of the test, which occurred on

a 13" MacBook Pro using the Google Chrome browser. Two participants had never used

a Macintosh computer before, so the test administrator allowed additional time prior to

the testing to help acclimate these particular participants. Overall, this did not seem to

affect the outcome of the test in an obvious way. The staff at the NCDHC should

undertake additional usability testing as they continue to redesign the site to make sure

that the design changes implemented help to correct the breakdowns in task completion

seen in the original testing.

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