Class Project for IST 331

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Report on Databrary with Suggestions for Improvement

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Abstract

Throughout the Fall semester of 2014, our team has been thoroughly studying human-computer interaction and using our research to give input on recommendations for improvement for an open data library called Databrary. We include two of the labs that we have completed over the course of this semester in IST 331; along with covering the knowledge and analyses gained from these results, we also included design implementations that could be used by the Databrary staff for their website. Our extensive research has shown that although Databrary’s site is functional on a basic level, there are quite a few design aspects that could still be improved in order to increase its ease of use. With this report, we hope our suggestions will help improve Databrary’s website allowing it to become more user friendly.
Table of Contents

I Introduction

II Perception Interaction Lab
   II.1 Introduction
   II.2 Method
   II.3 Results
   II.4 Design Implementations
   II.5 Summary

III Task Analysis Lab
   III.1 Introduction
   III.2 Method
   III.3 Results
   III.4 Discussion
   III.5 Design Implementations
   III.6 Summary

IV Key Redesign Improvements
   IV.1 Research Supported Changes
   IV.2 Future Improvements

V Conclusion

VI Appendices
   VI.1 Task Analysis: KLM
   VI.2 Task Analysis: GOMS

VII Resources
I. Introduction

This class project began under the direction of Dr. Frank Ritter, a Penn State professor belonging to the College of Information Science and Technology. Dr. Ritter is a professional in human-computer interaction and cognitive science, and as part of IST 331, our team was given the responsibility to test our knowledge of user-centered design from in-class lectures and personal understanding to analyze a website that we believe needs some revamping.

The site that we decided to examine was Databrary, which is a website designed as an open data library for information pertaining to developmental science. Databrary is essentially a repository that allows researchers to upload and share data that could potentially impact or advance the field of developmental psychology. The website contains tools that users can use at their disposal which will allow them to explore, share, and discover.

Two labs will have two labs act as a foundation for this report. The two labs that we have completed over the semester that will be included are the perception lab, and the task analysis lab. The perception lab was designed to see how users react to certain visual cues like font, text spacing, and even color and whether those factors affect a user’s ability to navigate through a site. The second lab included was a task analysis lab, and this was designed to see how long users took to complete certain tasks, like for example, searching for something and downloading it by using the search bar.

Based on the results gathered from these two labs, we were able to make several suggestions to Databrary in order to help improve the usability of the site. We hope that this newly observed information will be greatly valuable to Databrary, and that our studies and design suggestions will be considered for any potential future updates or even redesign of Databrary’s website. We are confident that the changes we proposed will be nothing but a benefit for Databrary and its users.
II. Perception Interaction Lab

II.1 Introduction

Websites use different combinations of color, text, and format to make themselves attractive. However, certain combinations of these three things make a website more usable to its users than others. Our group is looking into the Databrary website (http://databrary.org/) and we want to help them improve their usability to their users. We wanted to test how their current format compared to specific changes and how that would improve the speed and ease of use. Color is the result of perception and is not an intrinsic part of an object, under different lighting or contrast conditions the apparent color will change (Ritter, Baxter, Churchill, 2014). By changing the color of the links, we hope to improve the speed at which users read and find links. We will take the same approach with changing font style and line spacing, to alter attractiveness of the texts and line separations, respectively. With this data, we hope to then make the appropriate suggestions to the Databrary site.

II.2 Methodology

When we first conducted this lab, our group chose 6 participants to perform tasks on the Databrary website. Each participant was tested on a Sunday night on a laptop displaying the website. All of the participants resided in the State College area. However, to get a range of data that could mimic the users of the Databrary website, we chose participants of different genders and ages. Below is the participant’s specific information.

- Participant 1 - 48-year-old male
- Participant 2 - 21-year-old female
- Participant 3 - 21-year-old female
- Participant 4 - 22-year-old male
- Participant 5 - 22-year-old female
- Participant 6 - 18-year-old male

To add to this lab, we decided to get a few more participants that would be more similar to the current users of the Databrary site. Our team was able to test a TA, as well as a professor. Their results were added into the results from our original lab.

- Participant 7 - 22-year-old female
- Participant 8 - 43-year-old male

On our end, as the experimenters we had to first use the Google Chrome web browser on a mac and a PC and then go to the Databrary homepage. We then highlighted the three paragraphs in the middle of the page that read “Explore”, “Share”, and “Discover”. Next we
right clicked on the highlighted paragraphs and clicked “Inspect This Element”. This allowed a box to pop up that contained the code used to develop that portion of the webpage. We scrolled to the second to last section at the bottom of the code and changed the font from “Lucida Sans Unicode” to “Century” which is a sans-serif font and has been shown to help people read more efficiently when used. We then tested our subjects by having them read a paragraph aloud. They read the “Discover” paragraph with the new “Century” font. After we timed them, using a stopwatch on our phones, on that paragraph we reverted the code to the original font the website uses and timed the participants while they read another paragraph of the same length, this was the “Explore” paragraph.

The next two changes were line spacing and font color. We tested this by using the “Resources” page that can be found by clicking the “Resources” tab at the top of the home page on the Databrary website. We first tested the subjects on the original code on the website. We timed them on how long it took the participant to find “Databrary Release Levels” which is a link on the right side menu. After that, we changed the color of the words in the right side menu from teal to black. We did this by highlighting the menu, right clicking, clicking Inspect This Element and then changing the teal to black. We then had the participants find a link in the menu that was close to the original link. This time we had them find “Organizing Release Levels” and timed them as well.

For our final change, we had the participants find the phrase “Standard Operating Procedures” in the right side menu and timed them. Then we changed the line spacing from “1.4” to “2”. We changed the code in the same way we changed it the previous two experimental changes. After we changed the code we timed the participants to find the “Investigator Agreement” link.

All in all, we were able to complete this task by having the participants perform a task with the original code first. We would then take the laptop change the code and give it back to them to try a similar task with the new code changes. We did this with three different changes. Therefore, each participant had 6 total times: 3 original code times and 3 new code times.

II.3 Results

Our results showed that the different changes we made improved the speed that the users could read and find links on the page. Figures 1 and 2 show the linear and logarithmic lines of our data on font styles. The same applies to figures 3 and 4 for color, and figures 5 and 6 for line spacing. All the graphs show that compared to the original content, the changes we have made have shown to increase the time to do a task which can also increase usability.
All of the graphs above have time in seconds along the y-axis and the participant number along the x-axis. Each trend line is color coded to the corresponding data points with figures 1, 3, and 5 showing the a linear trend line. Figures 2, 4, and 6 show a logarithmic trend line.

Below in figure 7 is the table with all the participants’ averages. Similar to the graphs you can see that because of the change in the font from sans serif to serif, changing the color from blue to black, and increasing the line spacing from 1.4 to 2.0, the overall time spent trying to read or find a link was shorter. Therefore combining all three of these changes on one page should increase the ease of use for users.

<table>
<thead>
<tr>
<th>Average</th>
<th>Original</th>
<th>New</th>
</tr>
</thead>
</table>
II.4 Design Implementations

The results that we have acquired for this lab made us realize a common trend occurring in our data that we collected. What we noticed was that the modifications that we thought was better actually made it easier for the users to navigate their way through the site. Our perceived improvements made the users more easily see the things they’re supposed to see with better time and with a better perception.

Compared to the original condition of the site, the new changes we created for our test subjects improved the time it took for them to get where they were assigned by an average of 2-3 seconds. Regardless of the age and gender of the people observed, the results were pretty universal. The test subjects all improved their time and even admitted themselves that the modifications made it much easier to visualize the site and find their own path.

From the get-go, the Databrary site had shown areas for improvement. The fonts are a weird choice, the line spacing is unusual, and to make matters worse, the color choice is poor along with being set to an also poor color choice for the background. The site was riddled with issues that potentially can cause a lot of confusion amongst its users. Our team even had difficulty navigating through the site, as we found it troublesome to get past the inept line spacing, and the poor color choices, especially when light colored text is placed with an equally light backdrop.

With the current condition of the website, our team thought that the users’ perception would be severely stunted. To create a user interface that was easy on the eyes, our team decided that the fonts and the things users meticulously looked at had to be revamped so users can quickly process the web page’s contents as quickly and effectively as possible. As stated in the article, Perception in Visualization, “Human perception plays an important role in the area of visualization. An understanding of perception can significantly improve both the quality and the quantity of information being displayed” (Healey, 2009).

II.5 Summary

The data that we gathered offer findings that would be valuable to Databrary and companies who wish to make their websites more user-friendly and effectively provide the relevant information to their audience. Through our method of changing the font, text color, and line spacing, we have found that users demonstrated better efficiency navigating through the site.
This is important to this study because it illustrates the influence of user design usability. Between these 3 alterations we were able to gather similar data trends, and average as a whole, a Often companies or individuals utilize their websites as a tool to get information out to their targeted audience, however, if the audience cannot effectively navigate and find the relevant material, the website is not serving its purpose.

Although the lab produced interesting findings, there are some errors that should be taken into consideration. First, there are human errors. Subjects were asked to read two separate paragraphs, one of which might contain words that subjects are not familiar with and therefore delay the time and skew the data. Another outcome of human error might be that while subjects were asked to find the links they might foresee the next link they were asked to find. This could decrease the amount of time it takes for them to find the next link and, therefore, skew the data. The other error is technical errors. During the experiment we noticed that after the participants clicked on the link they found, the link turned color and was unable to revert to its original color. This could skew the data because participants were introduced to a technical complication that was unforeseen in the experiment.

Website designers should carefully consider the findings of this experiment and be aware of the errors observed in this experiment. Designing a website not only requires the necessary skills, but also the design skills to appropriately format the web-pages to fit the target audience.

III. Task Analysis Lab

III.1 Introduction

In this task analysis study, we will take a look at multiple test subjects and see how they handle performing certain tasks. We will be applying the Keystroke Level Analysis Model (KLM) and the GOMS model in an attempt to determine the usability of the site, Databrary, by examining our test subjects’ performances and the time it takes for them to complete their actions. Task analysis refers to a family of techniques for describing various aspects of how people work. Task analysis provides a deeper understanding of the goals people are trying to achieve (Ritter, Freed, Haskett, 2005). For a website that contains large amounts of information, it must be easily accessible and searchable for users. Because these factors are so vital to the Databrary website (https://nyu.databrary.org/) that we analyzed, our tasks involved having the test subjects experience the site’s basic features including the familiar login and password procedure, and the website allowing users to download and unzip files.

III.2 Methodology

When we first conducted this lab, our group chose 3 participants to perform tasks on the Databrary website. Each participant was tested on a laptop displaying the website. All of the participants resided in the State College area. However, to get a range of data that could mimic
the users of the Databrary website, we chose participants of different genders and ages. Below is the participant’s specific information.

- Participant 1: 22-year-old female
- Participant 2: 18-year-old male
- Participant 3: 21-year-old female

To add to this lab, we decided to get a few more participants that would be more similar to the current users of the Databrary site. Our team was able to test a TA, as well as a professor. Their results were added into the results from our original lab.

- Participant 4: 22-year-old female
- Participant 5: 43-year-old male

For our task analysis we chose to examine two very common tasks that the user will be doing. The first task is having the user login to the account on the Databrary site. The second task we had our users do was to download a file from the site and have them open it on their computer. We first completed a Keystroke Level Analysis (KLM) of the two tasks and estimated the time in milliseconds it would take to complete each task. Using The Keystroke-Level Model for User Performance Time with Interactive Systems article we took their times and created a key which can be seen below. Please refer to appendices A and B for the steps that we have laid out for both tasks.

The second task in particular could have a lot of user error. This is especially true if the user does not know where the information they are looking for is. The task could take a lot longer having to search through the site or page for the article and then for the file that they want to download.

Once all the estimations we made and the KLM and GOMS analysis finished our team went out to test some users. To do this the user was given a laptop to use as well as a slip of paper that had the login information for the site. With the participant starting on this page https://nyu.databrary.org/ they were told to login to the site using the information given to them. That information was this:

**Login:** kmf5438@psu.edu
**Password:** Ritter2014

With this information a timer was started as the user found the link to login, entered the information, and selected the login button. Once they were returned to the main screen the timer was stopped and recorded. While the user was logged into this account we had them perform the second task. The user was told to find and download the featured data set on that main screen.
The user was told to start and a timer was started. The user had to find the featured dataset, click on that link, and then search that page for the download file button. Once the file was downloaded the user then had to find it on their computer and open the file. After the file was open the timer was stopped and the time recorded. The user was then logged out and the process was repeated again for 7 trials total.

III.3 Results

Data sets for Task 1 and Task 2 were collected from three different participants. Displayed in Table 1 below and compiled into line scatter charts in Figures 1-4.

Table 1. Task 1 and Task 2 data collected from participants.

<table>
<thead>
<tr>
<th>Participant #1 Trials</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1 (seconds)</td>
<td>18.20</td>
<td>11.68</td>
<td>11.86</td>
<td>10.48</td>
<td>13.30</td>
<td>9.83</td>
<td>8.10</td>
<td>11.92</td>
</tr>
<tr>
<td>Task 2 (seconds)</td>
<td>20.18</td>
<td>12.83</td>
<td>9.05</td>
<td>9.00</td>
<td>8.51</td>
<td>12.80</td>
<td>10.15</td>
<td>11.79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant #2 Trials</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1 (seconds)</td>
<td>18.10</td>
<td>20.80</td>
<td>15.70</td>
<td>14.90</td>
<td>12.70</td>
<td>11.20</td>
<td>10.50</td>
<td>14.84</td>
</tr>
<tr>
<td>Task 2 (seconds)</td>
<td>14.70</td>
<td>14.10</td>
<td>9.50</td>
<td>8.40</td>
<td>8.10</td>
<td>8.30</td>
<td>8.10</td>
<td>10.17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant #3 Trials</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1 (seconds)</td>
<td>20.70</td>
<td>16.30</td>
<td>13.50</td>
<td>11.90</td>
<td>12.60</td>
<td>10.20</td>
<td>9.80</td>
<td>13.57</td>
</tr>
<tr>
<td>Task 2 (seconds)</td>
<td>25.90</td>
<td>18.40</td>
<td>20.60</td>
<td>15.30</td>
<td>13.40</td>
<td>10.90</td>
<td>9.80</td>
<td>16.33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant #4 Trials</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 2 (seconds)</td>
<td>19.71</td>
<td>14.61</td>
<td>15.30</td>
<td>12.81</td>
<td>10.50</td>
<td>9.81</td>
<td>8.10</td>
<td>12.97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Participant #5 Trials</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1 (seconds)</td>
<td>21.50</td>
<td>23.50</td>
<td>18.30</td>
<td>17.90</td>
<td>15.41</td>
<td>16.52</td>
<td>13.71</td>
<td>18.11</td>
</tr>
<tr>
<td>Task 2 (seconds)</td>
<td>22.10</td>
<td>20.80</td>
<td>17.80</td>
<td>17.32</td>
<td>15.7</td>
<td>13.23</td>
<td>13.51</td>
<td>17.20</td>
</tr>
</tbody>
</table>

Average Participant Trials

| Task 1 (seconds)      | 19.72 | 17.44 | 14.63 | 13.36 | 13.16 | 11.65 | 10.28 | 13.45 |
Report on Databrary with Suggestion for Improvement

| Task 2 (seconds) | 20.52 | 16.15 | 14.45 | 12.56 | 11.24 | 11.00 | 9.93 | 12.76 |

Figure 1. Time per trial for Participant #1 on Tasks 1 & 2 (Linear Regression).

Figure 2. Time per trials for Participant #2 on Tasks 1 & 2 (Linear Regression).

Figure 3. Time per trials for Participant #3 on Tasks 1 & 2 (Linear Regression).
The predicted time for Tasks 1 and 2 are 10.40s and 13.40s, respectively. According to Table 1, the average across all participants for Tasks 1 and 2 are 13.45 and 12.76, respectively. In comparison to the predicted time, the measured time for Task 1 was 3.05 seconds slower, and the measured time for Task 2 was 0.64 seconds faster.

To put it in perspective, participants, on average, spent more time than we originally predicted logging in in Task 1. However, Participants were slightly faster than we predicted on performing Task 2, which is locating, downloading, and opening a feature set.

According to Figure 4, the average time it takes for participants to complete each task generally follow the trend of decrease in time with every trial. Similar trend is demonstrated across all the data collected from individual participants. The trend lines are added by right clicking the line graph and selecting “Add Trendline”. In Figure 4, the trendline for both tasks show a negative slope, which means participants, on average, learned to perform the task faster overtime. Negative slopes are also demonstrated across all individual participant data sets. Equation of the trendline is added by checking the option for “Display Equation on chart” after right clicking the trendline and selecting “Format Trendline”
III.4 Discussion

Our original predictions suggest that both estimated times are most likely going to be faster than the actual times. The reason being that the users have to recall the email and password given to them to log in. They also don’t know the layout of the website so initial times will be high. Over time the estimated and actual times should start to overlap as the user learns more. What we have seen in the experiment is users have high initial starting times, but improve on average 10 +/- 1 seconds by the end of the seventh trial (Task 1: 19.00 - 9.50 = 9.50 seconds; Task 2: 20.30 - 9.40 = 10.90 seconds). The second task turned out to be faster than the estimated time, so our prediction was not entirely accurate.

III.5 Design Implementations

Our group found implications for our project from conducting this task analysis that will be very useful. After analyzing the tasks using GOMS and KLM analysis we have discovered a few places for improvement. The first issue we noticed was that the website allowed more than one account to be created using the same email address. For a recurring user of the website, one may forget that they have already signed up for an account and make a new one. This can lead to the user becoming confused with passwords and how many accounts they may have created. Not to mention not all accounts would allow for the same amount of access to the site. Someone could easily use the email address of a doctor or professor and falsify who they were in order to get access to upload content for users to see. This is very inefficient on the backend, if one user could have more than one account. It also could potentially result in a privacy breach of the website.

As for the the physical tasks we had our participants conduct, we felt a few changes could be made. As stated before, it would be much faster for someone to login or know if they already have an account. The website should show an error message if the same email address was attempted to be used twice to create an account. We also noticed that although the website did not allow for any dictionary words to be used in the password, someone’s name or last name could be used. We would suggest that due to the important authorization some of the users have, it would be more beneficial for the site if they created more rules for passwords. This would include requiring a certain number of capital letters or sequence of letters and numbers. This would make a password much harder to hack. Without proper protocols on passwords, the website could have a hacker post incorrect files or data that could confuse other users.

The last issue we noticed was how long it took a typical person to download a file onto their desktop and open it to read it. First of all, a person must sign up for the website before they can see certain data. This does not include needing authorization of any kind. In order to have access to certain files a common user would have to go through all of the steps of creating an account, authorizing the account, signing into the account, searching for the file, downloading
the zip file, unzip the file and then finally open it to read it. We believe any information that is allowed to be shared with the general public without any kind of authorization should be available for any user of the website. A person should not have to create an account to access some of the files on the site, my team used in our task analysis. That large process will turn many users off and prompt them to use other sites in lieu of databrary.

III.6 Summary

As a result of our task analysis that we ran with our subjects we have noticed a few areas for improvement. Conducting this experiment was beneficial to not only us but to the founders of databrary. Allowing brand new users to perform tasks on a website they have never seen before gives more insight to changes that can be made to improve the website. We noticed issues regarding time. Some of the simple tasks we felt should be easy for a user to perform and receive their information took far too long. However, task analysis is not solely based on how quickly a user can do a task. For example, when we noted the potential privacy issue with the repeatable email addresses and the easy way to hack a user’s password. We suggested that perhaps those issues be addressed, if and when they are, that will not allow for quicker log in time for the user. However, it will result in cleaner data in the user database to reduce repeat users. It will also ensure that private information and certain abilities the site allows specific users with authorization is not compromised.

Addressing issues such as these are what will make a user not only feel comfortable with using the site, but will prompt repeat users. Databrary wants a community of users to interact with each other and collaborate. If the website can make a few enhancements, we believe that would spark more interest and activity on the site. These suggestions will obviously not make the site perfect, as some users have different preferences. However, we feel that the insights we received are the most beneficial for the vast majority of users and will hopefully help the databrary team as well.

IV. Key Redesign Improvements

IV.1 Research Supported Changes

In the changes we made to the Databrary website using the google chrome code we feel these suggestions would benefit the user experience of the site. We feel our changes would be quite easy and cost effective to put into place. In multiple studies we have found, it is proven that Times New Roman is the easiest font to read. This is due mainly to the fact that it is a serif font. We tested this among our participants in the Perception Interaction Lab. We saw a drastic improvement in the amount of time it took a user to read and find certain links when we changed the font. Serif fonts being easier to read is not a fact well known to the public. It is a common improvement that many sites can make to allow ease of reading on their website.
We also changed the color of the menu text to allow for easier and faster reading of the menu content. Our users once again navigated to specific links much faster as soon as we changed the font color from a pastel teal to black. Once again this is an improvement that many sites may not realize can allow for much easier user navigation and is quite easy to fix. Lastly, we changed the line spacing of the three large paragraphs displayed on the main page of the Databrary site. In our lessons in IST 331 we learned that often times spacing of paragraphs can allow users to read information faster and retain information more easily. We tested this in our Perception Interaction lab as well and changed the spacing of the three large paragraphs on the main page of the website. We noted that this was again a quick fix to the code and vastly improved the user’s experience in using the site. Below we have included pictures of the current Databrary site next to the code change improvements.

Since we tested our Perception Interaction lab the site has drastically cut out the amount of information on their menu bar. This is of course a much needed improvement, as it allows users an easier time navigating the website. We believe our improvements will only enhance the user experience while it is paired with their most recent website change. The change in the color and font style of the edited menu they have created will still make it easier for users to navigate.

Figure 1A: Original

![Original Menu](image1)

**DATABRARY & DATAVU SUPPORT**

We are happy to announce that we are now hosting user support calls twice a week to answer all your questions regarding Databrary and Datavu.

The Databrary and Datavu support sessions will take place every Monday from 3pm-5pm and Thursday from 11am-12pm Eastern Time.

Joining the call is easy. All...

**UPCOMING EVENTS**

**MARCH 18, 2016**

Pre-conference at SRCF

Databrary will host a pre-conference workshop (SRCF) on March 18, 2016. Our pre-conference workshop will take place at the Philadelphia Convention Center.

The Databrary and Datavu support sessions will be available every Monday from 3pm-5pm and Thursday from 11am-12pm Eastern Time.

![Upcoming Events](image2)

Figure 1B: Line Spacing Improvement

![Line Spacing Improvement](image3)
Figure 2A: Original

**User Guide**
- Managing Access and Sharing
- Including Databrary in Funding Proposals
- Getting Authorized
  - Completing the Agreement
  - Managing Affiliates
- Collecting Shareable Data
  - Adding the Databrary Release to Your IRB Protocol
  - Obtaining Participant Permissions
    - Sample Participant Release Script
    - Video Example of Obtaining Databrary Release
- Databrary Release Levels
- Grandfathering Already Collected Data
- Common Questions about Sharing Video Data
- Planning for Data Sharing
- Organizing Your Data

Figure 2B: Color Improvement

**User Guide**
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- Common Questions about Sharing Video Data
- Planning for Data Sharing
IV.2 Future Improvements

The improvements that Databrary has already implemented have definitely improved their site. We strongly believe after testing multiple participants that our improvements stated prior from the Perception Interaction lab including serif font change, font color, and line spacing will help to continue to improve the website. Luckily for these suggestions, we were able to actually change the code to test our users and get definitive data.

Our other suggestions from our Task Analysis lab were based on potential improvements we noticed as well as observing some participants navigate their way through the website. One thing we noticed as a major problem regarding redundant data as well as a potentially security risk, is the fact that the same email address can make more than one account. People tend to forget passwords or if they made an account in the first place. If this happens a user could make more than one account causing the Databrary database to get overloaded very quickly if this happens too often. It could also skew data, Databrary may think they have a certain number of users based on the number of accounts there are, when in fact they may have a drastically lower number of actual users than they think due to the fact that a single user can make more than one account. We suggest an error message be prompted when an account is attempted to be made using a pre existing email address already used on an account.

We would also suggest that more precautions be taken in the creation of passwords. Although the password creation does not allow any dictionary words to be used as passwords, we realized it allowed us to use our first and last names as part of our password. This is a very easy way for a hacker or imposter to guess someone’s password if it allows it to be the user’s name.
We think it would be beneficial to make more criteria for the password including special characters, capitalization and numbers necessary for every user’s password. We suggest this due to the fact that certain users have special access to delete and upload data to the site. The site’s integrity could be compromised if it is easy to hack a user’s account.

Finally, our last suggestion is that certain information be accessible to anyone who visits the site. We noticed that certain data that did not need special access and was available for anyone who took the time to make an account took a very long time to finally download and read it. We tested the amount of steps and time it took a regular user to access a certain file. The user had to create an account, authorize the account, sign into their account, search for the file, download the zip file and then finally unzip the file in order to read it. Our group along with our participants felt that in order to gain access to a file that was not protected for users with special access took way too much time to download and read. We think the site would get more foot traffic, if they made some of their files and data accessible to users who do not want or have time to create an account. After receiving feedback from our participants we believe only data that needs to be protected for specific users should require a user to make and sign in to an account. Otherwise, it would be much easier to allow the data to be accessed by any interested user who wishes to tool around the website, without making the commitment of creating an account.

V. Conclusion

Following our semester of research in the form of many labs, we feel confident that our suggestions will make a vast improvement to the Databrary website. We were able to see the difference in site usability based on our code changes in our Perception Interaction Lab. We were also able to give suggestions based on feedback and timing of certain tasks by using a group of participants to test the site is our Task Analysis Lab.

We are not only able to give our suggestions to the Databrary staff but also provide them with methods, research and informative data. This will allow the staff to trust our suggestions due to the research we have conducted. It also will allow them the tools to recreate any of these experiments, if they wish to see how the changes truly do affect their daily users.

These labs will allow the staff at Databrary to recreate these experiments when they make any changes to their site that may not have been suggested by us. They can see how exactly the changes affect their users and if they are worth implementing or not. We hope Databrary uses our suggestions of improvements to make their site easier to use and more user friendly. We firmly believe if any or all suggestions are implemented it will increase the user traffic of their site and get more people involved in the Databrary community.
VI. Appendices

VI.1 Appendix A

KLM

KLM Key:

<table>
<thead>
<tr>
<th>KLM Key</th>
<th>Description</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Keystroke and button press</td>
<td>0.20 sec</td>
</tr>
<tr>
<td>P</td>
<td>Pointing to target on display</td>
<td>1.10 sec</td>
</tr>
<tr>
<td>H</td>
<td>Homing the hands on keyboard or mouse</td>
<td>0.40 sec</td>
</tr>
<tr>
<td>M</td>
<td>Mentally preparing for executing physical actions</td>
<td>1.35 sec</td>
</tr>
</tbody>
</table>

Task 1A Estimated Time:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move mouse to the login button</td>
<td>HP</td>
</tr>
<tr>
<td>Click button</td>
<td>K</td>
</tr>
<tr>
<td>Recall the email</td>
<td>M</td>
</tr>
<tr>
<td>Move hands to keyboard</td>
<td>H</td>
</tr>
<tr>
<td>Enter email</td>
<td>15*K</td>
</tr>
<tr>
<td>Use mouse to select password field</td>
<td></td>
</tr>
<tr>
<td>Hit tab to select password field</td>
<td>K</td>
</tr>
<tr>
<td>Recall password</td>
<td>M</td>
</tr>
<tr>
<td>Enter password</td>
<td>11*K</td>
</tr>
<tr>
<td>Hit enter to log in</td>
<td>K</td>
</tr>
</tbody>
</table>

Task 1A Estimation: \(2 \times H(0.40) + 29 \times K(0.20) + P(1.1) + 2 \times M(1.35) = 10.4 \times 1000 = 10400 \text{ ms}\)

Task 1B Estimated Time:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Move mouse to the login button</td>
<td>HP</td>
</tr>
<tr>
<td>Click button</td>
<td>K</td>
</tr>
<tr>
<td>Recall the email</td>
<td>M</td>
</tr>
<tr>
<td>Move hands to keyboard</td>
<td>H</td>
</tr>
<tr>
<td>Enter email</td>
<td>15*K</td>
</tr>
<tr>
<td>Use mouse to select password field</td>
<td></td>
</tr>
<tr>
<td>Use mouse to select password field</td>
<td></td>
</tr>
</tbody>
</table>

Task 1B Estimation: \(2 \times H(0.40) + 29 \times K(0.20) + P(1.1) + 2 \times M(1.35) = 10.4 \times 1000 = 10400 \text{ ms}\)
Recall password | M
Enter password | 11*K
Use mouse to login | HPK

**Task B Estimation:** \(5*H(.40) + 29*K(.20) + 3*P(1.1) + 2*M(1.35) = 13.4 \times 1000 = 13400 \text{ ms}\)

**Task 2 Estimated Time:**

<table>
<thead>
<tr>
<th>Task 2 Estimated Time:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Search for the featured article link</td>
<td>M</td>
</tr>
<tr>
<td>Move mouse to the link</td>
<td>HP</td>
</tr>
<tr>
<td>Click button</td>
<td>K</td>
</tr>
<tr>
<td>Search for the download file link</td>
<td>M</td>
</tr>
<tr>
<td>Move mouse to link and click</td>
<td>HPK</td>
</tr>
<tr>
<td>File downloads</td>
<td>5*M</td>
</tr>
<tr>
<td>Find and open file</td>
<td>MHPK</td>
</tr>
</tbody>
</table>

**Task 2 Estimation:** \(9*M(1.35) + 3*H(.40) + 3*P(1.1) + 3*K(.20) = 17.25 \times 1000 = 17,250 \text{ ms}\)

VI.2 Appendix B

**GOMS analysis:**

**Procedure: Login**
- Locate login link and click it
- Accomplish goal: get information
- Input the username information
- Accomplish goal: get information
- Input the password information
- Select the login button
- If login is successful, return goal accomplished
- Else repeat process

1. **Method for goal: Get information**
   - Decide if you want to use the username, then return with username information
   - Decide if you want to use the password, then return with password information

**Procedure: Download Data**
- Accomplish goal: find link
- Search page for the download link
- Accomplish goal: find link
- Search for downloaded file
• Open the file
• Return goal accomplished

1. Method for goal: Find link
   • Determine the link with the closest match to desired information
   • Point to link
   • Click link
   • Decide if the link was incorrect, then press the back button
   • Repeat until correct link is found
   • Return goal accomplished
VII. References


Group Information

Name of the group and the site analysed: Group 3: Databrary

Authors of the report and what they did:

Kristen Fajt (kmf5438@psu.edu)- (724)-630-5419-

IV Key Redesign Improvements

IV.1 Research Supported Changes

IV.2 Future Improvements

V Conclusion

Revision of lab and in charge of submission

Tyler Hickok (bmh5245@psu.edu)- (814)-574-6796

Making edits and additions to the following previous lab

II Perception Interaction Lab

II.1 Introduction

II.2 Method

II.3 Results

II.4 Design Implementations

II.5 Summary

VI Appendices

VI.1 Task Analysis: KLM

VI.2 Task Analysis: GOMS

Steven Kim (svk5440@psu.edu)- (267)-625-8245

Title Page

Abstract

Table of Contents
I Introduction

Jon Lin (yil5192@psu.edu)- (610)-737-8752

Making additions and revisions to the following previous lab

III Task Analysis Lab

III.1 Introduction

III.2 Method

III.3 Results

III.4 Discussion

III.5 Design Implementations

III.6 Summary

VII Resources

Contact at the organization:
Name: Rick Gilmore
email: rogilmore@psu.edu
phone: (814) 865-3664

What did the contact do during the semester, how did it work?

We emailed back and forth with Rick a few times this semester. Mainly to ask his permission if we could use the site and if he would be interested in working with us. We asked for him to allow us special permission on the site so we could see every side of the website as well. He granted us access and was very prompt every time we emailed him and asked a question.

Have you shared the report with the contact?

We have not yet shared the report with Rick.

Do you grant permission to Ritter to share the final report with the contact with a cover letter?
Yes our group grants permission for our final report to be shared with Rick Gilmore our contact.

Do you grant permission to Ritter to share the final report on the IST 331 web site?

Yes our group grants permission for Dr. Ritter to share the final report on his IST 331 website.

How likely are you to revise the report before sharing based on feedback?

We are somewhat likely to revise the report. It really depends on the amount of work that would be required in the revision.