Analyzing the Web Interface of the National Eating Disorder Association

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Abstract

Throughout the semester in IST 331 Organization and Design of Information Systems: User and System Principles, our team has learned a number of ways to analyze and improve an interface. Our group has been able to utilize task analyses and a learning analysis to gain a better understanding of how users typically proceed through a task. We have also examined interfaces through a perceptual lens, mostly focusing on aesthetic appeal and organization. Our team utilized these tools when analyzing the National Eating Disorders Association (NEDA) website, with the ultimate goal of improving the functionality of the site from a user’s perspective. We chose to analyze this website because we think it provides a crucial service to the community. Below, we will detail the importance of the website, and then proceed to suggest some potential improvements we have observed.

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1.0 Introduction

In this report our team will explain how we used the information we learned in our IST 331 course on usability and interface design to analyze, with the intention of improving, a web interface of an organization. We decided to analyze the National Eating Disorder Association (NEDA) because one of our team members had a work connection with the association in addition to the site’s importance and contribution to people in need.

Upon determining we would analyze the NEDA website, our team was ecstatic about the opportunity to be able to examine the web interface for an organization who makes such an important impact on American society. According to Eating Disorder Hope, another organization seeking to help with these types of illnesses, eating disorders are “a daily struggle for 10 million females and one million males”, and four out of every ten people have suffered, or who know somebody who has suffered, from an eating disorder (Eating Disorder Statistics). NEDA is one of the primary non-governmental information hubs for issues relating to eating disorders in the US, and so the site is crucial in supporting those suffering from eating disorders and their family and friends.

The National Institute of Mental Health (NIMH), the government organization in charge of managing mental illnesses (including eating disorders), has survey data that reinforces the prevalence of eating disorders. According to their data, roughly 2.4-3.0 percent of people aged 13-18 are affected by eating disorders (Eating Disorders Amongst Children). The exact breakdown by age group can be seen in Figure 1.1 below. These numbers obviously do not account for all people suffering from eating disorders because of the perpetuation of victims to not come forward or not seek help for their illness.
The statistics mentioned above exemplifies the importance of the NEDA webpage because not only are eating disorders life altering issues that require support, but also the main demographic of those suffering from eating disorders are impressionable kids and young adults that need help. However, the actual web interface of NEDA needs to appeal to a wide range of audiences, because the people who support those suffering from an eating disorder represent a wide range of ages and diverse social identities.

The National Eating Disorder Association website has a number of functionalities available to a user. First, a user in need can receive help or support in the ‘Find Help and Support’ part of the site. This function allows the user to call the helpline on the site, and read about support groups, treatment centers, or support networks. Second, general information about eating disorders is available for anyone who wants to get educated on them in the ‘Learn’ portion of the site. In the ‘Get Involved’ section users can volunteer to work for the organization, help in a NEDA walk (or other sanctioned NEDA events), or participate in their advocacy programs. The last functionality is the ‘Proud2BMe’ website which is an interactive safe community for teens and young people to discuss their eating related issues with one another. A picture of the main page of the NEDA website can be seen below in Figure 1.2. Figure 1.3 shows an image displaying the functionalities of the site.
Prior to starting our analysis of the NEDA website, our team reached out to the Lead Technology Representative from NEDA, Andrew Beyer, to see that a) it was permissible for us to analyze the site and b) if NEDA would be interested in receiving a copy of our report to be potentially taken into consideration with the design of their site. We received confirmation from Andrew that we could analyze the site and that they would be more than happy to get a copy of our report to consider in the development of their website.

As for the actual analysis detailed in further below, we conducted two specific analyses on two potential improvement areas: 1) a task analysis on placing the hotline phone number as a permanent piece of information on the top of the site and 2) a learning analysis on fixing the errors in categorization of information. In this report, we will divulge our procedure for each of these analyses, expound upon the data that came about in our experiments during the analyses, and explain the implications of each respective analysis.

During these analyses we came across a number of ancillary improvements. Additionally, we examined all aspects of the site excluded in our two primary analyses in order to create a
list of other improvements that we were not able to notice through our initial primary analyses. We will conclude the report by listing and describing these improvements that were not the focus of our primary analyses and explaining the implications of applying some of our improvements to the NEDA site.

2.0 Primary Analysis 1—Task Analysis

2.1 Introduction

The first analysis our group decided to conduct was a task analysis regarding the ease in locating the NEDA hotline. Our goal was to prove that moving the hotline to the top of every page as permanent information header will improve the user experience on the website. We are aware of the level of importance that NEDA places on the utilization of the hotline and believe that it should be one of the most recognizable features on the website. Although the placement of this number now is currently available after clicking the “GET HELP NOW” component at the upper right hand of the homepage, we believe that you can improve the design of your interface to make this number more noticeable by instilling it as permanent information on each page.

2.2 Task and Analysis of the Task

To progress our examination, our team decided to use a Keystroke Level Model, or KLM, to perform the analysis. Card, Moran, and Newell’s Keystroke Level Model involves breaking a task involving a single user into several component tasks, which can also be identified as subtasks. Dr. Frank Ritter and associates often refer to the importance of conducting a task analysis using the Keystroke Level Model in their book Foundations for Designing User-Centered Systems: “The time to do the whole task is calculated by simply adding up the calculated times for the subtasks. It should be noted that you also need to include the time it takes to acquire the task, i.e. the time it takes for the user to work out what to do” (Ritter et. al). The component tasks are keystrokes (K), pointing (P), homing (H) and drawing (D). The important part of the KLM is that the model is an estimating tool used to predict the time of a tasks completion. In Figure 2.1 below, a KLM for the current format of the hotline is shown.
Next to it is Figure 2.2 displaying a KLM for our suggested format of installing the hotline as a permanent piece of information at the top of every page.

Start on NEDA webpage

1. Home to mouse. H[mouse]

2. Point to the ‘Get Help Now’ button. P

3. Click ‘Get Help Now’ button. K[mouse down]

4. Point to hotline number. P

Start on NEDA webpage

1. Home to mouse. H[mouse]

2. Point to the hotline number. P

Table 2.1 KLM on Current Improved Hotline Display Structure

Table 2.2 KLM on Potential Hotline Display Structure

Table 2.3 below displays the predicted times for these tasks based on the Keystroke Level Models above. As you can see in the Keystroke Level Model time predictions below, our suggested improvement would reduce the completion time of the task significantly (finding the hotline).

Time Predictions:

Current Hotline Display Structure: $T_{execute} = [ 1 t_k + 2 t_P + 1 t_H ]$

$= [ 1 (1s) + 2 (1.1s) + 1 (0.4) ]$

$= 3.6s$
Potential Improved Hotline Display Structure: 
\[ T_{\text{execute}} = [1 \, t_p + 1 \, t_H] \]

\[ = [1 \, (1.1s) + 1 \, (0.4)] \]

\[ = 1.5s \]

**Table 2.3—KLM Time Predictions**

### 2.3 Data Gathering

The KLM analysis presented our team with predictive information on the potential change in the hotline format. Our group decided conducting an actual experiment with participants would help in affirming this hypothesis. Before conducting the experiment, each member of our team performed the task three times in an attempt to gain an understanding of our subjects thought process as well as to gauge the simplicity of finding the hotline number for ourselves. We decided that testing a total of six participants, three of which were female and the three other male ranging from ages 17 to 21, would give us sufficient insight to this task and enable us to draw conclusions. Additionally, we did not allow the subjects time in advance to familiarize themselves with the interface, and we had questioned them to ensure that they have had no prior experience with the site.

When initializing the task for the participant, we loaded the NEDA homepage and then started our timers to eliminate homepage load time. Once the participant was able to double-click on the hotline number we then stopped our timers. Each participant completed this task a total of one time.
2.4 Results and Analysis

The results for this task analysis can be viewed in Table 2.4 below.

<table>
<thead>
<tr>
<th>Participant</th>
<th>KLM Predicted Task Time for Current Hotline Display Structure</th>
<th>Observed Task Time</th>
<th>KLM Predicted Task Time For Improved Hotline Display Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>3.6s</td>
<td>6.36s</td>
<td>1.5s</td>
</tr>
<tr>
<td>Participant 2</td>
<td>3.6s</td>
<td>4.78s</td>
<td>1.5s</td>
</tr>
<tr>
<td>Participant 3</td>
<td>3.6s</td>
<td>7.32s</td>
<td>1.5s</td>
</tr>
<tr>
<td>Participant 4</td>
<td>3.6s</td>
<td>8.23s</td>
<td>1.5s</td>
</tr>
<tr>
<td>Participant 5</td>
<td>3.6s</td>
<td>10.41s</td>
<td>1.5s</td>
</tr>
<tr>
<td>Participant 6</td>
<td>3.6s</td>
<td>4.56s</td>
<td>1.5s</td>
</tr>
</tbody>
</table>

**Table 2.4—Observed Experiment Times vs. KLM Predicted Time**

In Table 2.4 above, the first column is the predicted time for the current structure of the hotline. The second column is the observed times from our experiment on the current hotline structure. The third and final column is the predicted time for our suggested improved hotline structure. As seen in the results, it had taken the subjects much longer to complete the task than the predicted task time equated through the KLM analysis. This is due to cognitive distractions and mental operators that users encounter in progressing through a task that are not accounted for in the KLM. Additionally, the experiment confirms our hypothesis that altering the location of this important piece of information would lessen the time it takes for the average user to locate the hotline number, thus improving the user experience.
2.5 Implications for Design

Task analysis is an essential form of examination to evaluate how users perform certain tasks, and thus it is a vital tool in developing a well-designed interface. This is because the way users perform a task can directly relate to the usability and efficiency of the design. For a website like the National Eating Disorder Association site, simplicity is the best approach for presenting the organization’s data and information. Delivering information to users in the most direct and noticeable fashion can improve the users interactivity with the web page. User testing matters because it shows how the typical user would approach the task of locating information. This testing of particular individuals can generate a valuable reference for interface designers in predicting how the general population of users will interact with the interface. Once the behaviors of users during a task are acknowledged, it becomes easier to predict how the users will perform the given task. This is important when completing time-sensitive tasks, such as locating important information. In the scope of the NEDA website, this means being able to quickly locate the emergency hotline telephone number. In conclusion, moving the hotline number as permanent header information on each page of NEDA’s website will align with these concepts.

3.0 Primary Analysis 2—Learning Analysis

3.1 Introduction

The speed in which the average person can learn a task yields valuable information in the process of designing usable interfaces. If the users assimilation with an activity or device is quantifiable, you can determine what is preventing the shortening of that assimilation process. The identification of what is limiting an increased speed in completing the task reveals what can be improved upon on in order to increase the usability for said activity or device. In more simple terms, trying to grasp the average intelligence of users can enhance the design process.

Our second analysis for the NEDA website is analyzing the miscategorization of information in its main menu bar. We concluded the best way to measure the proper categorization of
information is to conduct a learning analysis to show how long it takes users to find information and how they improve over repetitions.

On the NEDA webpage, the main menu bar consists of nine menu items, each containing numerous sub-menu items. Considering the site is used to quickly and efficiently guide individuals to seek help and information about eating disorders, the menu items and sub-menu items need to be properly configured. Additionally, the information in the bars should be adequately organized. When menu items are not categorized under the appropriate names, it prolongs information seeking. Due to the significance of this site, it is extremely important for the user at hand to find information in the quickest manner possible.

3.2 Methodology

In order to test the need for altering the information organization, our team conducted a learning analysis which involved two tasks—1) we asked our users to locate ‘Symptoms’ of an eating disorder and 2) we asked our users to find walks in Philadelphia region. In both of these tasks the user was told not to utilize the search bar, therefore, the categorization of menu information was vital. The recorded times of our experiment are displayed in table 3.1 below.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>65.47s</td>
<td>38.82s</td>
<td>19.46s</td>
</tr>
<tr>
<td>2</td>
<td>55.64s</td>
<td>20.02s</td>
<td>14.41s</td>
</tr>
<tr>
<td>3</td>
<td>45.08s</td>
<td>27.20s</td>
<td>17.16s</td>
</tr>
<tr>
<td>4</td>
<td>29.44s</td>
<td>20.31s</td>
<td>15.55s</td>
</tr>
<tr>
<td>5</td>
<td>48.25s</td>
<td>27.14s</td>
<td>16.54s</td>
</tr>
<tr>
<td>6</td>
<td>52.66s</td>
<td>31.48s</td>
<td>19.26s</td>
</tr>
<tr>
<td>7</td>
<td>48.31s</td>
<td>37.21s</td>
<td>28.03s</td>
</tr>
<tr>
<td>8</td>
<td>53.21s</td>
<td>33.57s</td>
<td>30.69s</td>
</tr>
</tbody>
</table>

Table 3.1: Time Taken for Participant to Complete Task 1
Where: Task 1 - Time to Locate Walk

<table>
<thead>
<tr>
<th>Participant</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21.53s</td>
<td>23.24s</td>
<td>9.21s</td>
</tr>
<tr>
<td>2</td>
<td>13.53s</td>
<td>52.21s</td>
<td>29.59s</td>
</tr>
<tr>
<td>3</td>
<td>33.90s</td>
<td>15.53s</td>
<td>11.30s</td>
</tr>
<tr>
<td>4</td>
<td>22.31s</td>
<td>32.05s</td>
<td>10.29s</td>
</tr>
<tr>
<td>5</td>
<td>25.88s</td>
<td>19.13s</td>
<td>15.22s</td>
</tr>
<tr>
<td>6</td>
<td>27.34s</td>
<td>20.12s</td>
<td>13.87s</td>
</tr>
<tr>
<td>7</td>
<td>34.51s</td>
<td>22.41s</td>
<td>16.63s</td>
</tr>
<tr>
<td>8</td>
<td>26.74s</td>
<td>28.28s</td>
<td>14.34s</td>
</tr>
</tbody>
</table>

Table 3.2: Time Taken for Participant to Complete Task 2
Where: Task 2 – Time to Locate Symptoms

3.3 Results and Analysis

Analyzing learning in the designing of interfaces is crucial because you need to understand the developmental thought process of the user to in order to design for the user. A well-designed user interface is supposed to be just complicated enough to properly serve its purpose while being simplistic enough to be easily processed and learned by the users. In the context of the NEDA website, the information organization of the page is not close enough to this simplistic ideology. The result of a simpler user interface design can be increased efficiency and thus improved productivity on the part of the user.
The recorded times from Table 3.1 above show a clear time disparity between the initial trial and subsequent trials. This high initial time is partly due to the possible misplacement of information into categories, hindering the user from finding the information quickly and easily. Also impacting this is the users unfamiliarity with the site. The decline in time during the following trials is attributable to the user knowing the proper route to finding the information following their preliminary trial. Without the use of the search bar to easier find the information at hand, the user is left to navigate through the menu tabs until they find the information they are looking for.

To improve the speed in which users are able to locate information on the website, certain information should be condensed, as well as moved into appropriate categories. For example, ‘Symptoms’ is located under the ‘Learn’ tab. Treatment’ and ‘Recovery’ which are also under ‘Learn’ and go hand in hand with ‘Symptoms’ each have their own distinct sub-tabs despite having very small amounts of information. Consolidating ‘Treatment’ and ‘Recovery’ into one page is just one example of how reorganizing the number of sub categorizations can aid the simplification of the information seeking user experience. Isolating ‘Symptoms’ as its own page would be another adequate change to improve the information organization on the site.

When viewing our participants complete the task, almost all of them selected the ‘Events’ tab to search for walks, as opposed to, the “Get Involved” tab. This further ties into the concept of miscategorized, or mislabeled information. ‘Events’ and ‘Get Involved’ could be condensed into one main tab because they contain similar information.

Additionally, the vast amount of tabs as currently constructed come off as intimidating to a user viewing the main menu bar. Certain sub-tabs contain very little information. Another example is under the ‘Ways to Give’ tab. When the user clicks on ‘Donate’, ‘Donate by Phone’ or ‘Donate by Mail’, either solely a telephone number or an address comes up. The site should condense these sub-tabs into one main tab ‘Donate’, where the user can view the different methods of donating, as opposed to three different tabs.
3.4 Implications for Design

Making information seeking easier for users is imperative to the user experience on the website. Simplifying the interface is a safe approach to ensure competent user interaction with the interface. “A simple UI [user interface] does not imply a lack of functionality. Typically, the result of a simpler UI is a shortened learning curve, increased efficiency, and improved productivity. This empowers a user to increase their proficiency with the application” (Implementing). Quantifying this ease contains a number of components. Different wording is one aspect of this, as various users can perceive the same words totally different. This varied perception in users is necessary to acknowledge in order to be able to properly categorize information using correct tab and menu names. Determining the most simplistic title for information headers is one example of how wording can impact a user’s learning of an interface. Another aspect of users becoming accustomed to using the site is the previously mentioned need for reexamining the organization of menu bars.

Condensed information with a visual friendly layout can give abundant information to the user within a short period of time. Utilizing this feature for categories can have a better outcome than creating unnecessarily overlapped tabs and menus. This not only confuses the users but it also can easily lead to the misplacement of information and frustration when using the interface.

4.0 Conclusion

Our team has absorbed a mass amount of information on interface design and usability throughout our semester in IST 331 to supplement our experience as users in today’s technologically immersed society. Using this background, our group conducted some analyses on the National Eating Disorder website to hone our skills as interface designers and to aid an important organization like NEDA in operating their site to the betterment of the user experience. The analyses our team conducted have shed light on the functionality of the NEDA website and some improvements that can be made to better the user’s interactivity with the website.

Above, we detailed two major analyses. The first of these primary analyses was a task analysis we conducted to justify placing the NEDA hotline phone number as permanent information at
the top of every page of the NEDA website. We determined the need to conduct this analysis after three out of four participants from an ancillary analysis noted the necessity for the change. After predicting a time reduction in finding the hotline number through a Keystroke Level Model, we directed the task analysis and affirmed that the change would ease the locating process for the user.

The second primary analysis was a learning analysis that showed that diminishing the number of menu and submenu bars, and a proper reorganization of information on the site, would benefit the user in their interaction with the site. We did this by conducting an experiment where the users needed to complete two information-seeking tasks. The length of time it took the users to find two important pieces of information for NEDA’s website users—symptoms of eating disorders and NEDA events—revealed the necessity for changes to the information organization on the site.

Our team observed a number of other potential improvements that came about as consequence of conducting our two primary analyses and our interactions with the site. Below are a list of these improvements and the reasoning behind the suggested change:

1) **Reformat the expandable information in the margins on information pages**
   - The information on the left margin of information-based pages is too lengthy, most likely due to over specification. We noticed in our learning analysis that two of our four participants spend time scanning the lengthy margin information for the proper tab. An example of the expandable information in the margin can be seen in Figure 4.1 below.
During our the experiment we conducted for our learning analysis our team noticed two participants clicking the ‘Get Help Now’ button to submit their search request instead of the magnifying glass button. This misstep was attributable to the proximity of the two buttons. Simply moving the ‘Get Help’ button slightly to create more space between the two would fix the problem, as would changing the magnifying glass to an actual ‘Search’ button. An example of the current format can be seen in Figure 4.2 below.

When the user hits the ‘Get Help Now’ button, as seen in the image directly above, the user is brought to the ‘Get Help’ page (the page can also be accessed a number of other ways). Here, the user is presented with two options for contacting assistance from a NEDA representative, 1) the hotline number and 2) the option to chat with a representative over the online service. The link to access this chat is
supposed to be embedded in the “Click to chat with a helpline volunteer”, but it is not clickable. Figure 4.3 below illustrates the issue.

Figure 4.3—False clickable chat link on ‘Get Help’ page

4) Fix the false clickable information on the home page

- The home page of the NEDA webpage displays boxes that have enclosed images and associated links to the main pages of their core functionalities. Currently, the only way to get to these core pages through the boxes on the main page is to click the little blue arrow at the bottom of these boxes (under the picture, page title, and explanation). This poses an issue because the target area is very small. Additionally, the full box highlights when the mouse is placed over it, as if it is clickable, but it is not so. The image, text, and full box all appear to be clickable to the average user but are not. Figure 4.4 below illustrates this problem.

Figure 4.4—False clickable information on the home page
5) Change the circle buttons used to cycle through the ‘Stories of Hope’ on the main page

- Near the bottom of the main page are ‘Stories of Hope’ that continuously cycle for the user to see various accounts from others dealing with eating disorder related issues. The apparatus used to cycle through the stories is unclear upon first glance and could easily be altered for the better. Currently, the cycling is done through small circle buttons that are difficult to see and click, and are a struggle to correlate with specific stories. A numbered cycling setup would allow the user to associate a cycle tab with a story and thus better interact with the ‘Stories of Hope’ feature. If the circles are to be kept, they should be made bigger to optically engage the user. Figure 4.5 below shows the current setup for the cycle of “Stories of Hope”.

![Figure 4.5—Cycle buttons for “Stories of Hope”](image)

Our team felt very fortunate to be able to conduct an analysis on a webpage for an organization that generates a positive impact on society. The National Eating Disorder Association “supports individuals and families affected by eating disorders, and serves as a catalyst for prevention, cures and access to quality care” (Mission). This is an important cause for all demographics, but is especially pertinent to the technologically oriented youth, as noted previously. The perpetuity of young people to rely on technology for information retrieval further enhanced our perception of the importance of analyzing the site. Our ultimate objective in beginning this analysis was to aid the improvement of a site through our examination. We hope we have reached this goal and
NEDA can use the suggestions we proposed through the two primary analyses, and the auxiliary suggestions we noted, to improve the design, functionality, and usability of the webpage and thus enhance the user experience on the site.
5.0 References


