Analysis of Goodwill Industries Mission Website and Suggestions for Improvement

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Abstract (Eric McCoy)
Although Goodwill Mission appears to be in the development phase, we examined the website’s existing features and thought of some innovative ways to improve them.

We first analyzed the main page as it is the most complete part of the website. We focused on the perceptual elements of the main page to determine their effectiveness at drawing the user’s attention and communicating their function. We used Fitt’s Law to determine the effectiveness of the current layout and suggest changes which may reduce the time the users take to recognize the buttons and their functions.

The second analysis concerns, store finding, a task currently not implemented on the site. The analysis compares the performance and learning time for finding a Goodwill donation station with Goodwill Mission and a third party locater, against finding a donation station at Goodwill’s main page for North Central Pennsylvania with an imbedded map. This quantitatively demonstrates how including a “Find Location” page may increase the effectiveness of the website.

The third analysis assumes the form of a “day in the life” of a user who is curious about what Goodwill’s mission is. This lab models the user’s activities with GOMS analysis in the hope it can demonstrate the ineffectiveness of the site’s current layout.

Finally, we included a brief heuristic evaluation section where we informally asked the users what they would like to improve in the interface.

Our conclusion briefly summarized the changes that we could justify making to the website from the collected data. This will hopefully help Goodwill to continue helping people in Pennsylvania and across the nation.
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1. Introduction (Aaron Monick)

We analyzed the Goodwill Mission website (http://goodwillmission.com/). It was built as a means for users to find Goodwill donation locations or to partner with Goodwill for a donation drive.

This document includes methodology and tools for conducting studies on users while collecting data to get quantitative and qualitative results from which to draw conclusions. A perceptual analysis was conducted on users to determine the website’s usability as the user is guided through the typical user tasks on the website. Next, a learning analysis is conducted to measure the benefits of adding a missing feature to the website. After this, a task analysis is conducted to show the effectiveness of tasks with differing cognitive demands. Finally, a heuristic evaluation session is held to observe the test users interact with the website, while having them discuss the pros and cons of the interface.

*Figure 1.1 Goodwill Mission of Pennsylvania Main Page (http://goodwillmission.com/)*
2. A Brief Introduction to the Record User Interface version 2.3 Key Logger (Eric McCoy)

The Record User Interface (RUI) version 2.3 Key Logger is a tool which logs the keystrokes and actions a user takes when it is running (Cheng et al., 2012). Two of the four studies employed RUI to accurately total the times it took for users to perform actions such as moving the mouse pointer to a specified icon or interacting with mouse buttons.

![Image of RUI version 2.3 Key Logger Input Page]

**Figure 2.1 Screenshot of The RUI version 2.3 Key Logger Input Page**

![Image of RUI version 2.3 Key Logger Output Screen]

**Figure 2.2 Screenshot of Output**

Figure 2.1 shows RUI’s input screen and Figure 2.2 shows its output screen (Cheng et al., 2012). The data from Figure 2.2 is what we used to make our conclusions on perception time, learning
time, and task performance time.

3. Study 1: Perception Analysis (Steven Bruno)

3.1 Participants

The five participants were a sample of college students from various backgrounds and with varying degrees of computer ability. They were collected from the dormitory building where the proctor lives.

3.2 Material and Equipment

The users were presented laptop whose browser was pre-loaded to the website. The proctor gave them verbal instructions on how to proceed. The proctor used a phone stopwatch to record the results.

3.3 Procedure

The person tested was presented with a computer pre-loaded with the home page of the Goodwill Mission website (http://www.goodwillinc.org/about/mission). The proctor than told the user to perform various tasks including: changing the displayed picture on Goodwill Mission’s main website via the arrows and clicking on links to navigate to the pages specified in Goodwill Mission’s website headings (Shown on page four).

3.4 Results and Recommendations

The first element of the website whose change could increase usability is the top menu bar. The menu bar is offset from the top, making the target area small because the user needs to move the mouse underneath the padding between the menu and the top of the window. It would be much simpler to place the menu bar at the top, where the user would be able to simply move to the top of the window to select tabs. According to Foundations for Designing User Centered Systems (FDUCS), which is a textbook on usability design, this is called Fitt’s Law. Fitt's Law states “the time to point to an object is related to the distance from the object and inversely related to the size of the object.” The Card et al. equation for this is: Time= 70ms * log₂(d/w + 0.5). (Ritter, Baxter, Churchill, ch.11).
As seen in the lower portion of Figure 3.1, the suggested change would place the menu bar beneath the border of the web browser and the computer monitor. According to Fitt’s Law removing the padding from the top of the screen can increase menu access speeds by around 25%. This would help users use the site faster and therefore reduce the load on the servers hosting the website, as users would leave the site sooner. Because the webpage is written in PHP, our group was unable to re-write the website and test it with users. Due to our predictions with Fitt’s law we believe this would be a profitable change to make.

Enabling the picture slider to receive keyboard input would also aid usability. The slider cycles through three pictures of differing heights causing the webpage layout to shift around. When presented with the webpage in question, a group of five users agreed the movement of the webpage and the arrows on either side of the display confused them. The general consensus was the arrows beside the slider implied a keyboard interface could be used to switch between slides. Two of the five participants attempted to do so when asked to switch between slides. When questioned about it, they all agreed if the location of the arrow keys was not constant the keyboard should be provided as an additional means of input.

We recommend adding the capability to switch slides on the front page with the arrow keys. In Chapter 5 of FDUCS, the authors write that recognition memory is slower to use than recall memory (Ritter, Baxter & Churchill, Ch. 5, 2014). Most, if not all users are aware of how to use the arrow keys on a keyboard, and this recall memory would allow them to quickly and effortlessly switch slides. The table shows the average times for five users to switch between
images on the front screen, all averaging about 3.6 seconds, this time could be reduced via a keyboard shortcut.

Table 1 Times to perform tasks (Units are in seconds)

<table>
<thead>
<tr>
<th>Task Trial</th>
<th>User A</th>
<th>User B</th>
<th>User C</th>
<th>User D</th>
<th>User E</th>
<th>Average time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1</td>
<td>4.41</td>
<td>4.41</td>
<td>2.26</td>
<td>3.66</td>
<td>3.6</td>
<td>3.668</td>
</tr>
<tr>
<td>Trial 2</td>
<td>4.16</td>
<td>4.28</td>
<td>2.48</td>
<td>3.7</td>
<td>3.43</td>
<td>3.61</td>
</tr>
<tr>
<td>Trial 3</td>
<td>3.98</td>
<td>3.86</td>
<td>3.3</td>
<td>3.25</td>
<td>3.56</td>
<td>3.59</td>
</tr>
<tr>
<td>Trial 4</td>
<td>5</td>
<td>3.68</td>
<td>2.61</td>
<td>3.88</td>
<td>2.8</td>
<td>3.594</td>
</tr>
<tr>
<td>Trial 5</td>
<td>4.05</td>
<td>3.63</td>
<td>2.43</td>
<td>4.6</td>
<td>2.31</td>
<td>3.404</td>
</tr>
</tbody>
</table>

The final aspect of this website which could be changed is the links. Three out of thirteen links do not lead anywhere and four out of thirteen lead to the same page. This website was made to inform users of the mission of Goodwill, a task the users are unable to perform with the links provided.

Figure 3.2 shows four buttons which change color when the pointer is hovered over them. When presented with the task of determining the mission of Goodwill, four of the users immediately noticed the buttons while only one employed the menu at the top of the page. Unfortunately, these buttons lack functionality, and the users were left confused about their function. Figure 3.2 also shows two active links. The first, “Who are WE”, redirects you to another website, it would be much simpler to include this information on the current website. This confused users as there was no indication they had been taken to another website other than the drastic change in layout. The link under “Donations Accepted” was broken, and users were left with no way of determining the donations accepted.

Figure 3.2 Navigation Icons
4. Study 2: Learning Analysis (Eric McCoy)

4.1 Participants

The five participants were a sample of people from various backgrounds and with varying degrees of computer ability. They were tested after a family gathering.

4.2 Material and Equipment

The users were presented with a laptop whose browser was pre-loaded with the website before it was placed in front of them. The person performing the study then gave participants verbal instructions. Zip codes for the counties where users were searching for donation sites were provided by an 8x11 piece of white paper. RUI was run in the background to record user input (Cheng et al., 2012).

4.3 Procedure

The person tested was presented with a computer pre-loaded with the home page of the Goodwill Mission website (http://www.goodwillinc.org/about/mission). The proctor then told the user Goodwill was running a fundraiser at a school in Brockway, and they had to find where the information was displayed on the site. After they found this information the proctor then told them because the site has no, “Find a Store” functionality they would have to find the school via an open tab of Google Maps. This test was repeated twice with the targeted location being Brockway, Pennsylvania and once with the target being Clearfield, Pennsylvania. Changing the location to Clearfield was done to verify the users were memorizing the processes and not merely recalling the locations of the donation sites.

A comparison was then done with the, “Find a Store” interface at Goodwill’s main website for North Central Pennsylvania (http://www.goodwillinc.org/shop/find-a-store). Users were directed to employ this interface to find donation locations in Brockway for two trials and then to find donation locations in Clearfield.
Figure 4.1 Goodwill’s Main Website for North Central Pennsylvania (http://www.goodwillinc.org/shop/find-a-store)

Figure 4.2 Goodwill’s imbedded map interface for North Central Pennsylvania (http://www.goodwillinc.org/component/storelocator/?view=map&Itemid=0)
4.4 Results and Recommendations

Rasmussen’s theory of performance stipulates that when users begin a task they assess the object’s features, with their sensory mechanisms and process cues from the object regarding its purpose. After this they make a rough model of this information to use and update as learning continues (Rasmussen, 1983). The data from the learning portion of the lab reinforced the conclusion that clear information about the site’s function quickens the user’s attainment of competency. In the process of learning new tasks users learn by employing declarative information given to them about the task which is transformed into procedural information after repeated practice (Ritter, Baxter & Churchill, Ch. 5, 2014). This procedural memory is recall based allowing for users to easily employ it in speeding up their performance.

Because procedural memory is recall and thus requires less cognition, we should design the website to prod the development of procedural memory. The lower portion of Goodwill’s page for North Central Pennsylvania contains small paragraph indicating how users may find Goodwill locations(http://www.goodwillinc.org/shop/find-a-store). The upper portion includes clearly marked tabs revealing where various categories of information are located. This declarative information contained in the Goodwill main site for North Central Pennsylvania caused it to out-class the Goodwill Mission site in terms of performance of the initial task by as shown by Table 2. We suggest including brief paragraphs in noticeable places on each page explaining what can and can’t be done on the pages of the Goodwill Mission website.

A novice will take longer than a professional to assess his situation and build a mental model about it based on the presented cues. Therefore a user will experience delay in a task if they are forced to switch venues. The data collected supports this conclusion as shown in Site 1, Trial 3 where the user was forced to switch to Google Maps to find donation locations. This method took 195.6 seconds longer on average than the Site 2 Trial 3 method, where a store location search map was imbedded in the site. The location search map on the main Goodwill site for North Central Pennsylvania(http://www.goodwillinc.org/component/storelocator/?view=map&Itemid=0) includes several
pieces of declarative information the user can employ to build models about the tasks they can perform on this page. On the other hand, the Goodwill Mission website does not contain a map; this interrupts the user's task performance to switch to Google Maps. This constitutes a computer initiated interruption which forces the user to undergo task re-orientation and thus “causes a significant increase in task completion time for a variety of web-based tasks” (Bailey, Konstan, Carlis, 2000).

Table 2 Task completion time (Time in seconds)

<table>
<thead>
<tr>
<th></th>
<th>Site 1</th>
<th></th>
<th>Site 1 minus Site 2 Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject A</td>
<td>Subject B</td>
<td>Subject C</td>
</tr>
<tr>
<td>Trial 1</td>
<td>90</td>
<td>77.4</td>
<td>132</td>
</tr>
<tr>
<td>Trial 2</td>
<td>24</td>
<td>29.4</td>
<td>32.4</td>
</tr>
<tr>
<td>Trial 3</td>
<td>24</td>
<td>193.2</td>
<td>19.2</td>
</tr>
</tbody>
</table>

Including a few paragraphs about the page, and the scope of its function will set Goodwill Mission’s learning curve low enough for visitors to be unafraid of venturing further into the website to find where to give their donations.

5. Lab 3. Task Analysis (Xiaoyun Zhao)

5.1 Introduction to Task Analysis

A task analysis examines the actions and cognitive processes taken to achieve a task on a given interface. This aids in understanding the flow of information so we can compare it to other tasks, and improve it. This information is important to consider when making changes for a given interface. When performing a task analysis we must ask ourselves who the users of this website are and what are they trying to do. Because Goodwill is a company aiding charities and nonprofits, we can assume the users of this website are included the list below.

- People looking for a donation drive location.
- An organization looking to partner with Goodwill.
- People looking for retail store location.
• People searching for employment.
• People looking for more information about Goodwill.

All the measurable tasks users can perform on the Goodwill website are listed below.

• Tap arrows on photo slider to reveal more Goodwill information.
• Find “Who we Are” link to navigate to the Goodwill of North Central Pennsylvania main website.
• Find the mission of Goodwill.
• Find the counties of Northern Pennsylvania which Goodwill operates in.
• Find school and church donation drive locations.
• Contact Goodwill using the email link in the footer.

By following all the links of this Goodwill Mission website we found some mal-functional calls to action which should be fixed or removed because broken links are a trait of a poor website. The tasks needing replacement or fixing are below.

• All social media buttons.
• “More Detail” button in slider.
• A “Call Us” calls to action with no link or number.
• Broken link to list of all acceptable donation items.
• Unnecessary dynamic search bar in top-right.
• No link to “Jobs Created” action.
• Missing action for signing up to newsletter.

We preformed Goals, Operations, Methods, and Selection rules (GOMS) analysis on this website. GOMS focuses on specifying the details of error-free, expert behavior to predict learnability, usability, and task execution times. It is used when there are multiple ways to accomplish a task and testing is needed to find the best one (Ritter, Baxter & Churchill, Ch. 11, 2014).

Components of GOMS from FDUCS:
- Goals are the desired states of affairs. They are brought about by the application of methods and operators.
- Operators are elementary, perceptual, motor or cognitive actions. Intended either to change the world or to change our knowledge about the world. In practice, operators are really those sub goals whose methods of solution we have decided not to analyze any further. The choice of appropriate operators is critical to a GOMS analysis. Some critics note the absence of clear guidelines for doing so, although it is often a fairly straightforward decision.
- Methods describe the procedure for achieving goals. They contain a sequence of sub goals and operators, with conditions potentially attached to each part of the method. These conditions relate to the current task environment.

Selection rules augment the basic control structure of the model. Where multiple methods are available the selection rules indicate how to choose between the methods. For example, when scrolling a document: long documents are easily scrolled using the search function; short documents are easily scrolled using the scroll bar; and miniscule documents are easily scrolled with the arrow keys (Ritter, Baxter & Churchill, Ch. 11, 2014).

5.2 Participants

The five participants were a sample of students from various backgrounds and with varying degrees of computer ability; they were tested at a local coffee shop.

5.3 Material and Equipment

The users were presented with a laptop had the Goodwill Mission website preloaded. Instructions were given verbally(http://goodwillmission.com/). RUI was run in the background to record user input (Cheng et al., 2012).

5.4 Procedure

The person tested was presented with a computer that was pre-loaded with the home page of the Goodwill Mission website(http://goodwillmission.com/). The proctor than told the user to
perform the tasks enumerated in Table 3. We used the GOMS methodology to catalog the task hierarchy which is listed exhaustively in Appendix A.

Table 3: Tasks and User Interface Comparison

<table>
<thead>
<tr>
<th>Task Assignment</th>
<th>Light Load</th>
<th>Medium Load</th>
<th>Heavy Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1: Find Goodwill’s Mission using ABOUT US link in Navigation Icons.</td>
<td>The Light Load task asks participants to find the ABOUT US page on the website (Shown in Figure 5.6).</td>
<td>The Medium Load level tasks requires participants to first go to the Goodwill's main website by clicking the hyperlink Who Are We, and then find the Mission of Goodwill(Main site and mission page shown in Figure 5.7 and 5.8).</td>
<td>The Heavy Load task asks participants to find the Goodwill's local store in State College. Participants need to first navigate to the main site through the hyperlink, and then click on the Shop button in the top menu. In the new page, click the Find a Store button, and look on the map to locate the store(Shown in Figure 5.9)</td>
</tr>
</tbody>
</table>

| User interface for Goodwill Mission compared to Goodwill’s main site for North Central Pennsylvania | Name is ABOUT US Containing menu is the Navigation bar Menu Item Label is ABOUT US | Name is Mission Containing menu is About Us Connecting Hyperlink is Who Are WE Menu Item Label is Mission | Name is Find a Store Containing menu is SHOP Connecting hyperlink is Who Are We Containing menu is About Us |
Figure 5.6 ABOUT US Page, Mission in Red Box, (http://goodwillmission.com/aboutus.html)

Figure 5.7 Goodwill Main Site Mission Link in Red Box (http://www.goodwillinc.org/)
The estimated times, were always lower than the times in practice as shown in Table 4. There are two possible reasons for such phenomenon. First, before receiving the requirements of the tasks, participants had no idea about the website's features. A certain amount of time is needed for them to become acclimated to the website. Second, although participants reached the proper page, they found it necessary to confirm whether they finished the task successfully, thus extending the time.

Table 4: Tasks Time for Tasks of Different Mental Loads

<table>
<thead>
<tr>
<th>Light Load Task</th>
<th>Medium Load Task</th>
<th>High Load Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subject</td>
<td>Trial 1</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>15.17</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>28.94</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>10.08</td>
</tr>
<tr>
<td>Average</td>
<td>18.06</td>
<td>10.50</td>
</tr>
</tbody>
</table>

5.5 Results and Recommendations
We recommend two improvements for Goodwill's website based on the conclusion above. First, although users with different knowledge backgrounds have different searching habits, there are some basic principles which apply to most of the online searching. For example, different keywords on the webpage serve different "information scent" purposes for users. Picking the right name for each button or link is important to increase the website's “information scent” to the proper user (Ritter, Baxter & Churchill, Ch. 7, 2014).

Second, the Fitt’s Law modeling in the experiment reveals contents which have a similar information scent should be arranged in a visually close fashion, effectively reducing the users' pointing time when performing a task (Ritter, Baxter & Churchill, Ch. 11, 2014).


6.1 Participants

The five participants were a sample of college students from various backgrounds and with varying degrees of computer ability, found in a public thoroughfare.

6.2 Material and Equipment

The participants were presented with an iPad mini with the Goodwill Mission website preloaded(http://goodwillmission.com/). The facilitator focused on moderating the session and took notes on a notepad recording all the participants’ ideas and actions. Participants would record their ideas on sticky notes because they are portable and can be rearranged.

6.3 Procedure

The participants were told to think like user design experts to analyze and discuss the Goodwill Mission website(http://goodwillmission.com/). Each had a chance to interact with the website on the iPad mini before the brainstorming session got started. All participants had access to the iPad mini during the brainstorming session for further evaluation. The facilitator did not contribute ideas but encouraged creativity and provided direction.

6.4 Observations
On the iPad mini, the navigation bar for the website is missing, an apparent difference when comparing Figure 6.1 to Figure 6.2. This flaw in the website’s implementation restricted this heuristic evaluation session to the main page.

Because of the small screen size of the iPad mini, which is 7.87 x 5.3 inches, the participants can only see the “Goodwill Industries” logo and the top part of the image slider which changes images every seven seconds. All participants chose as their first action to click the salmon colored button on each slide of the slider reading either “More Detail” or “Donation Drive”, only to be disappointed they were not given information. Some participants cycled through each slide and try this action every time to check all links were broken.

![Figure 6.1 Screenshot From an iPad mini](image-url)
As the participants scrolled down the website, they tried to click the four icons in the row under the slider because they said they looked like buttons. They soon realized the salmon colored text under the icons were clickable links. A significant portion of users were surprised when they tap the “Who Are We” text and get redirected to another website belonging to Goodwill. Significant portions were also disappointed upon tapping the action under “Donations Accepted” to be redirected to an Internal Server Error page.

Another major error all participants noticed when they scrolled down the webpage is when the content under the slider repositions every seven seconds when the slider transitions to an image with a different height. This content shuffling annoyed participant as they attempted to read content that suddenly shifted elsewhere on the page or out of the visible view. The flaw in the interface noted by the participants was the social media buttons at the top and bottom of the webpage was merely reloaded the page once clicked.

Once this website was presented to a class of thirty students and a professor, they were quick to point out the absence of a relevant “FAV” icon as the current one is an orange star (As Shown in Figure 6.3).
Figure 6.3 Current FAV Icon

Changing this icon to the one relevant to Goodwill, would make the website more aesthetically pleasing as well as reminding the user they have the Goodwill site open among the multitude of tabs on their browser.

Figure 6.4 Updated FAV Icon

6.5 Results and Recommendations

All participants agreed this was obviously under construction due to the mal-functional pages and spelling errors in the content. Assuming the errors in the interface were fixed, the participants were asked to recommend a feature to improve the usability of the website. Some of these suggestions for improvement are listed below.

1. Make the slider smaller and make sure all images have the same height.
2. Add more content regarding the intentions of this website as the user scrolls down the page.
3. Have one footer instead of two and make it smaller.
4. Make the website scrollable and dynamic so it opens up sections of more content upon an action button being pressed.
5. Incorporate animations upon action triggers.
6. Make the website accessible via a mobile device.
7. Add FAV icons.

7. Conclusion (Aaron Monick)

The Goodwill Mission website is partly functional but, the errors pointed out in this document can be quickly fixed so attention can be turned to the improvements we suggested. The perceptual analysis of the main page determined that it could be more effective at drawing the user’s attention and communicating the function of button’s if the top bar “buffer” was removed. The learning analysis revealed that adding some declarative information about the website as well as avoiding the necessity to switch venues can help to improve performance. The task analysis which models the user’s activities with GOMS demonstrates how the site’s current
layout complicates the simple task of ascertaining Goodwill’s mission. Finally the heuristic evaluation section helped us to gain some anecdotal evidence about the changes that user’s would like to see in the website, such as making the website available via mobile devices and giving the website an FAV icon.

Hopefully by making just a few of the noted changes, Goodwill will be able to improve the quality of its already exemplary service the Pennsylvania and the nation.
8. References (Eric McCoy)


Operators

**K - Keystroke:** This operator is the unit time based on typing speeds. The average time for button press or release on mouse is 0.10 seconds (Kieras, 1993).

**P - Pointing:** This operator is moving mouse to the target.

**S - Scrolling:** This operator is the time user needs to scroll down to find the information. It varies by users' operation system, mouse type, user operating habits, etc. The average time is recorded using cell phone timer app.

**M - Mental preparation:** This operator accounts for the time a reasonably experienced user takes to perform a mental act. It depends on both the complexity of the task, and the user's familiarity of the interface. The average time for such mental process is 1.20 seconds (Kieras, 1993).

**W - Waiting:** This operator is the time the user waits the system to respond. The time is recorded using stop watch app on cell phone.

Methods

Method for goal: find information
Step 1. Recall information seeking requirements from working memory
Step 2. Navigate through the web page
Step 3. Accomplish goal: Move to information
Step 4. Compare information with requirements in working memory
Step 5. Accomplish goal: make decision
Step 6. Return with goal accomplished

Method for goal: move to information
Step 1. Decide. If the required information is on the screen, then read the content
Step 2. Decide. If the required information is outside the viewing area, then use the scroll bar to get more information on the page
Step 3. If there is no more content to read, then return with goal accomplished

Method for goal: locate link
Step 1. Determine the most possible link for required information
Step 2. Point to the link
Step 3. Click on the link
Step 4. Decide. If the new page does not contain required content, then press the Backspace button and go to the Step 1
Step 5. Accomplish goal: find information

Selection rules

Selection rules set for goal: make decision
If the information cannot be found on the current page, then accomplish goal: locate link
If the information can be found on the page, then
Return with goal accomplished