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I. EXECUTIVE SUMMARY

This test was administered to assess the usability of the website of the Carnegie Museum of Art located in Pittsburgh, PA. Four participants took part in this study. They were all former residents of Pittsburgh and had lived there at least two years. For this study, they assumed the persona of a current resident of the city. Participants were required to do ten tasks that a normal visitor might do on a visit to this website. Their answers were recorded on a test report and compared against benchmarked responses both in timing and accuracy to response. Participants were recorded during the test and in the posttest debriefing and their experiences both during the test and during the posttest questionnaire and debriefing were observed and written down.

For each of the ten tasks performed, mean and standard deviations were calculated and compared. In addition, task accuracy percentages were calculated based on the participants completion of the tasks within the benchmarked times, completion of the tasks but outside the benchmarked times, and completion of the tasks only with help and outside the benchmarked times. These percentages helped us pinpoint the most serious areas needing change on this website.

The major findings of this study indicate that the participants had problems in three major areas:

- The search function of this website is not specific enough to give a user the information they need in order to learn something about the museum’s collection.
- The ability to purchase a ticket for the museum online, as it is currently designed, is extremely difficult due to the placement of the link for the e-ticketing site.
- The design of the web pages with regard to the navigation is compromised because of difficulty seeing the color and size of the font used in the local navigation, an inconsistency in formatting within the body of the text, inaccuracy of links in several areas, and a lack of a clear indication of how to access the Home Page.

Of the three major findings listed, the most critical one and the one most likely to bring the greatest assistance to the users of this website is a restructuring of the search feature of this site.

Although this restructuring may require great effort on the part of the Carnegie Museum’s staff, the benefits to the users of this website in increased accessibility to the museum’s collections and programs and increased ease of use to its visitors should enhance the goals of this museum to reach out to the people of Pittsburgh, PA and its surrounding communities.
II. METHOD

A. Purpose

The main purpose of this test was to identify problems with the Carnegie Museum of Art’s website by participants who assumed the persona of an individual who lives in Pittsburgh, PA. Each participant attempted to complete a series of tasks that a typical visitor to the website might do if they lived in Pittsburgh or the greater Pittsburgh area.

B. Problem Statements

These specific questions needed to be answered:

1. Is the labeling of the buttons on the Global Navigation bar clear enough to permit a user to choose the correct button initially to complete a given task?
2. Is the labeling of the buttons on the individual navigation bars clear enough to permit a user to choose the correct button initially to complete a given task?
3. Is the labeling on the buttons in both global and local navigation consistent enough throughout the site so that visitors are not confused?
4. Is the placement of the “purchase tickets” link obvious to a visitor, and if the visitor does purchase a ticket in advance, do they know how to return to the museum site for more information?
5. Is the Search function robust enough to handle different kinds of inquiry? Examples would be: hunt for a piece of art, for an artist, for a period of art, or for an item to buy.

C. User Profile

A total of four participants were tested. The participants had the following characteristics:

Have lived in Pittsburgh for at least two years sometime during their late teen or adult life.
Be able to assume the role of a current Pittsburgh resident in order to answer the questions from that persona’s viewpoint.
Have at least one year of experience using the World Wide Web.
D. Methodology

The usability test consisted of a series of tasks that the participant, under the persona of a resident of Pittsburgh, completed in a given period of time. This test gathered usability data via direct observation of the users as they attempted the assigned tasks, successful completion of questions that were given as part of the tasks, and a pre- and posttest questionnaire on attitude towards the site. The usability test consisted of four main sections:

1. Participant Greeting and Background Questionnaire
   Upon arrival, the participant was greeted by the test monitor, where the participant asked any preliminary questions. The participant completed the “Participant Background” form, which consisted of a demographic section, and a user appraisal of his or her comfort level with the Web.

2. Orientation
   The participant received an overview of the scenario in which he or she was participating. The participant also received an overview of the testing procedure in order to help him or her to feel comfortable. At this time, the participant was informed that the session would be recorded on audio and / or video.

3. Performance Test
   The performance test consisted of a series of ten tasks that the participant was asked to carry out while being observed. The scenario was as follows:
   - You will be asked to assume the persona of a resident of Pittsburgh, PA. “You would like to visit the museum and you would like to take advantage of some of the activities that the Carnegie Art Museum has to offer, not only for yourself, but for your neighbors and for visitors from out of town. You also might be interested in volunteering at the Museum. In addition to the above needs, you want to research some information about the museum on their website in order to gain answers to some questions that you have.
   - They were asked to complete ten tasks. These tasks were designed to indirectly determine information for the five problem statements mentioned earlier in this report. The participants were given an answer form in which to place the information that they discovered.
   - The participants were observed performing these tasks in order to study the techniques used while working with the Carnegie Art Museum's web site. The time necessary to accomplish the various
tasks were recorded. All tasks were to be completed unassisted if possible, and to the best of the user’s ability; however, the test monitor answered questions regarding the logistics of the test. The participant was asked to use the “Think Aloud” method to verbalize any concerns, problems, or successes while working through the tasks.

- During the test, completion time and errors were recorded for each task. The test monitor maintained notes on participant behavior and comments. The sessions were audio taped.

4. Participant Debriefing
At the conclusion of the test, the participant was debriefed by the test monitor at a table in another room and given a chance to evaluate his or her experiences with the Carnegie Museum of Art's web site. The session was recorded for audio. The debriefing consisted of two main parts:

A posttest questionnaire designed to elicit information regarding the participant’s comfort levels during the various tasks.

An Interview and discussion concerning the participant’s overall comments about the web site made in the posttest questionnaire, and any difficulties that were encountered during the performance of the tasks.

The debriefing session was an important part of this test and served two main purposes: It gave the participant an opportunity to discuss his or her overall feelings about using the web site, and it allowed the test monitor to record information about the participant’s choices made while completing the tasks.

Once the debriefing was completed, the participant was thanked and escorted from the room.
### E. Task List

<table>
<thead>
<tr>
<th>Task No.</th>
<th>Task Description</th>
<th>Task Detail (MTC in minutes)</th>
</tr>
</thead>
</table>
| 1        | What days of the week and what times during the day is the Museum open to the public during the month of April? | **SCC:** Days and Times: Tues - Sat. - 10:00 - 5:00 pm; Sun. - Noon - 5:00.  
**MTC:** 2.0 |
| 2        | How much does it cost to go to the Museum? Using your own age, go ahead and get your ticket on line up to the point where you have to pay for it. | **SCC:** Adults - $10; Senior - $7; Children - $6; Members - free. Successfully order your tickets online where the order form is visible, but you have not entered any payment information.  
**MTC:** 5.0 |
| 3        | You particularly like French Impressionist painting. The Museum is supposed to have a collection of paintings by French Impressionist artists. Give the names of three of these painters and the names of their paintings. | **SCC:** Edgar Degas: *Henri Rouart in Front of his Factory*; Claude Monet: *Nymphéas (water lillies)*; Paul Cezanne: *Landscape near Aix, the Plains of the Arc River*  
**MTC:** 10.0 |
**MTC:** 7.0 |
<table>
<thead>
<tr>
<th>5</th>
<th>Your neighbor’s children, 5 and 12, are looking for some activities to do this summer. Does the Museum have any day camps for children? If so, name two possible choices for each child. They can be half-day or full-day camps. Find the registration form you would need to print. After finding it you can go on to the next task.</th>
<th>SCC: Find the PDF form for registration and returning to the next task; 14 camps for 5 year olds; 28 camps for 12 year olds. Titles: vary.</th>
<th>MTC: 8.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>You would like to buy the book, <em>The Carnegie Museum of Art Highlights</em>, which shows some of the Museum’s collection. Go ahead and put it in your shopping cart. How much is it? How much is the shipping? Go ahead and check out up to the payment window.</td>
<td>SCC: Successful purchase of the correct book up to the payment screen. Price: $24.95; Shipping: $6.95.</td>
<td>MTC: 8.0</td>
</tr>
<tr>
<td>7</td>
<td>You are interested in volunteering at the Museum. What do you have to do to become a volunteer?</td>
<td>SCC: There is no information except an e-mail or a telephone number.</td>
<td>MTC: 2.0</td>
</tr>
<tr>
<td>8</td>
<td>You heard about a sculpture called <em>Victory</em> by Saint-Gaudens that the Museum owns. You have heard that it was a model for another statue. Where is that other statue located and who does it honor?</td>
<td>SCC: Honors William Tecumseh Sherman and is found at Grand Army Plaza, E. 59th street entrance to Central Park, New York City.</td>
<td>MTC: 5.0</td>
</tr>
<tr>
<td>9</td>
<td>Andrew Carnegie wanted to collect “Old Masters of tomorrow” for his Museum. What was he talking about?</td>
<td>SCC: He collected contemporary art (modern art) for his time, many of which were the Impressionists paintings.</td>
<td>MTC: 2.0</td>
</tr>
<tr>
<td>10</td>
<td>There was an exhibit in the Summer of 2002 on one of the neighborhoods in Pittsburgh. Which neighborhood was it?</td>
<td>SCC: Oakland</td>
<td>MTC: 2.0</td>
</tr>
</tbody>
</table>

Task List Legend:  SCC = Successful completion criteria  
MTC = Maximum time to complete task (in minutes)
F. Test Environment and Equipment Requirements

The following items were available for participant use:

- Computer on which to perform the test of the CMOA website.
- Form on which to write the results of the task questions.
- Pencil and pen for participant’s use.
- Paper for jotting down additional notes if necessary.

A stopwatch was used to time tasks during the testing; a hand-held recording device was used during the debriefing session.

G. Test Monitor Role

The test monitor greeted the participant and offered him or her some refreshments. The test monitor then led the participant through the orientation. Once the test began, the test monitor was located in the same room as the participant, where she could watch the participant, record task times, and write observations.

The test monitor answered participant questions regarding test logistics but not about how to perform tasks, unless the participant had exceeded the benchmark times and needed assistance to continue the task. At the closing of the test, the test monitor debriefed the participant at a table in another room.

H. Evaluation Measures

The following evaluation measures were collected and calculated

- **Times**
  The times needed to complete each task in the list were recorded, and an average time calculated across all the participants for each task.

- **Number of Participants**
  A comparison was made, per task, of the number of participants able to complete the tasks within the benchmark without error, the number of participants able to complete the tasks without error, but outside the benchmark, and finally the number of participants able to complete the tasks without error, but who need help in some form to complete the task. Percentages were calculated for these three groups based on each of the individual tasks.

- **Error Classification**
The errors observed were sorted based on their type and criticality. These classifications are:

a. Observations and Comments

- The test monitor recorded when participants had problems, including the source of the error if known.

b. Type and Criticality

- Non-critical Errors: A participant made a recoverable error and was able to recover during the previously benchmarked time

- Critical Errors: A participant made a non-recoverable error, which was judged by his or her inability to recover from it during the previously benchmarked time, or the participant was unable to continue the task at all without intervention.

- Affective Domain

  The participant was administered a Likert-scaled test before and after the testing, which assessed comfort level and knowledge of the World Wide Web in general and art museums in particular. The numbers were compared with each other, along with the test monitor’s assessment of the participants perceived comfort level and knowledge.

III. RESULTS

A. Quantitative Results

**Participant Completion Times:**

The timings (see Figure 1) of the tasks do not necessarily reflect successful completion of the task. There are three possible situations: 1) the task was completed successfully within the benchmark - (A), 2) the task was completed successfully without assistance but outside the benchmark - (B), 3) the task was completed successfully with assistance but outside the benchmark - (C). In certain cases (B), the participant was permitted to go over the benchmark to see if they could complete the task successfully if given more time. In a few cases, illustrated by an asterisk, the participant finished the task within the benchmark time, but had to be assisted before the benchmark time was reached because of a critical error (see above definition). Therefore, their success is indicated as No, despite a timing that was within the benchmark.
Performance Score Summaries:
The overall trends in performance were also examined to determine if there were areas that were particularly troublesome to the users. In addition, these areas were also examined to see if outside help would change the success rate for these individual tasks. The only task that could not be performed successfully by any of the participants in spite of outside assistance was task # 3, to find the names of three French Impressionist painters and their paintings. Another Search task, # 8, also proved difficult to half of the participants both within and without the benchmark times. The task was 100% successful, however, after assistance was given to the remainder of the group. Task # 2, buying a ticket online also proved problematic for the users with 0% success until they were given assistance on where to find the link. The success rate than became 100%. There was also only a 50% success rate in task # 5, finding a summer camp when measured within the benchmark. That number rose to 75% with additional time, and 100% with outside assistance.

<table>
<thead>
<tr>
<th>Task #</th>
<th>Tasks</th>
<th>Percentage of Participants Performing Correctly (within benchmark)</th>
<th>Percentage of Successful Participants Regardless of Time</th>
<th>Percentage of Successful Participants Regardless of Time &amp; with Assistance</th>
<th>Mean Time (minutes)</th>
<th>Standard Deviation (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Days and hours museum open</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>1.72</td>
<td>0.33</td>
</tr>
<tr>
<td>2</td>
<td>Cost of tickets; purchase online</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
<td>10.76</td>
<td>1.37</td>
</tr>
<tr>
<td>3</td>
<td>Find the names of 3 French Impressionist painters &amp; paintings</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>13.26</td>
<td>2.42</td>
</tr>
<tr>
<td>4</td>
<td>Name two current special exhibitions</td>
<td>75%</td>
<td>75%</td>
<td>100%</td>
<td>2.12</td>
<td>1.71</td>
</tr>
<tr>
<td>5</td>
<td>Find 2 summer camps for a 5-year old and 2 for a 12-year old</td>
<td>50%</td>
<td>75%</td>
<td>100%</td>
<td>10.59</td>
<td>0.29</td>
</tr>
<tr>
<td>6</td>
<td>Buy The Carnegie Museum of Art Highlights book from the store</td>
<td>75%</td>
<td>100%</td>
<td>100%</td>
<td>5.68</td>
<td>2.33</td>
</tr>
<tr>
<td>7</td>
<td>Find out what you have to do to be a volunteer</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>1.89</td>
<td>0.85</td>
</tr>
<tr>
<td>8</td>
<td>Victory - model for a larger statue of whom and where is it located?</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
<td>4.43</td>
<td>1.39</td>
</tr>
<tr>
<td>9</td>
<td>&quot;Old Masters of tomorrow&quot; - what was Carnegie talking about?</td>
<td>75%</td>
<td>75%</td>
<td>75%</td>
<td>2.54</td>
<td>2.64</td>
</tr>
<tr>
<td>10</td>
<td>Neighborhood profiled in special exhibition of summer 2002</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>2.60</td>
<td>0.25</td>
</tr>
</tbody>
</table>
B. Qualitative Results

**Posttest Questionnaire:**
The posttest questionnaire (see Appendix C) revealed several areas of concern with the participants. This questionnaire was designed to elicit affective responses from the participants on general and specific aspects of the website, with a focus towards obtaining direct feedback concerning the problem statements that were being investigated. The questions were phrased to indicate ease of use of a particular aspect of the website, so that responses that showed Disagree or Somewhat Disagree indicated that the site was not perceived as being easy in that area. Question 7 was eliminated prior to the testing but erroneously left on the posttest questionnaire. Numbers indicate number of respondents in each rating. There were four participants tested.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat Disagree</td>
<td>3</td>
<td>2</td>
<td>N/A</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat Agree</td>
<td>3</td>
<td>2</td>
<td>N/A</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>1</td>
<td></td>
<td>N/A</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat Disagree</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat Agree</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Agree</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Aspects Easy to Use</th>
<th>3. Aspects Difficult to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global navigation</td>
<td>3</td>
</tr>
<tr>
<td>Local navigation</td>
<td>1</td>
</tr>
<tr>
<td>Search feature</td>
<td>3</td>
</tr>
<tr>
<td>Registering for a class</td>
<td>1</td>
</tr>
<tr>
<td>Signing up to be a volunteer</td>
<td>3</td>
</tr>
<tr>
<td>Buying a book from the store</td>
<td>2</td>
</tr>
<tr>
<td>Finding information</td>
<td>3</td>
</tr>
</tbody>
</table>

Figure 3
Verbal Comments:
Comments were recorded from the participants both during the testing of the website and during the posttest debriefing. Many of the comments are presented here to elucidate the concerns, frustrations and praise heard from the participants during the course of this usability testing of the website and to support the recommendations for changes in the website, which are being presented in this report. Each individual’s comments are separated by semicolons and two asterisks **.

<table>
<thead>
<tr>
<th>Task Number</th>
<th>Task Description</th>
<th>Participant Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Days and hours museum open</td>
<td>No Comments Given</td>
</tr>
<tr>
<td>2</td>
<td>Cost of tickets; purchase online</td>
<td>What's a radio button? How do I get back to the Home page?; **It's got to be under Visiting Museum (referring to purchasing ticket online); ** It's got to be on there (referring to Info section to buy ticket online). Buying a ticket is easy, it just took a long time to find it. Select ticket type is confusing. How do I get back? Where is the home page?; **</td>
</tr>
<tr>
<td>3</td>
<td>Find 3 French Impressionist paintings</td>
<td>Collections - paintings: &quot;There are only four&quot;? Pictures are too big. When I did a search, it wasn't clear why many of the choices came up.; ** Isn't there a Search Engine? I don't see one. Oh, I see … on no - page not found!; ** This could go on forever! There's no order to this search results, they don't make sense. There are too many words; ** Well, I know that two of them are French, but are they Impressionists? (looking at Collections: Paintings), I can't find Search. Those are awfully small letters. You can't find a direct answer, you have to piece it together (all three comments referring to the results from search); ** I am totally frustrated trying to get the information. This is why I don't do this (referring to search engine results). You would think if you typed in French paintings (in search engine) you would get a list of paintings and little pictures. There is too much text here. Why did summer camp come up in this search (still referring to the French paintings search)?; **</td>
</tr>
<tr>
<td>4</td>
<td>Name two current special exhibitions</td>
<td>No Comments Given</td>
</tr>
<tr>
<td>5</td>
<td>Find 2 summer camps for a 5-year old and 2 for a 12-year old</td>
<td>I couldn't find the other camps. Should have bolder fonts in main text. I can't see the links on the side very well.; ** When there are so many words on the page, I just can't read it all. It's not clear that you've gone to another page (referring to the registration form). **</td>
</tr>
<tr>
<td>6</td>
<td>Buy <em>The Carnegie Museum of Art Highlights</em> book from the store</td>
<td>How do I get out of this page? There's no cancel button.; ** Books are not in any particular order. They should be alphabetical, this could take all day! Hey, how do I get back to the main site? (not realizing he has left the CMOA site); **</td>
</tr>
<tr>
<td>7</td>
<td>Find out what you have to do to be a volunteer</td>
<td>Doesn't tell me anything. I'm not even e-mailing a real person, just volunteer @…; ** That's just an e-mail. I assumed that this page would tell me what I needed to do to be a volunteer - training, etc.; ** Just contacting someone at the museum is more of a commitment than I would want to make.; ** I would just call the number not e-mail. That's not my first choice of communication. I would hesitate to send an e-mail. **</td>
</tr>
<tr>
<td>Question Number</td>
<td>Question Description</td>
<td>Comments</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>1</td>
<td>Overall, I found the Carnegie Museum of Art Website ...</td>
<td>Front page was pretty; ** The fonts don't bring your eyes where you need to see and they should be bold and highlighted.; ** Website is intimidating, for one reason or another. You can't get past certain obstacles. Who ever put the site together doesn't know much about their public. The pictures are pretty though.; ** Looking for more specific information with the labels was difficult, search wasn't better - gave you too much information and not specific enough. Summer camps were better - probably because I am more familiar with the subject. The more familiar you are with the subject, the friendlier you perceive that website. How can I use the least amount of steps to get what I want? **</td>
</tr>
<tr>
<td>2</td>
<td>Ordering Online</td>
<td>No Comments Given</td>
</tr>
<tr>
<td>3</td>
<td>Global Navigation</td>
<td>Good - drop downs only had a few things to choose from; ** When I went to home page, I could usually pick the right tab.; ** I didn't go to them at first, but then I realized that they had drop downs.</td>
</tr>
<tr>
<td>4</td>
<td>Local Navigation</td>
<td>Has a lot of redundancy, Because of color, can't tell which ones are links and which ones are not (links should be underlined and blue); ** Local bars need to be more prominent. Text implies one direction when actually need to go to the sidebar (referring to summer camp information); ** Local navigation is not as logical as the global. Exhibitions is the only one easy to get to information.; ** Local more clear because more detailed. Nice to have on left hand side.</td>
</tr>
<tr>
<td>5</td>
<td>Search Function</td>
<td>Use to seeing at the bottom of the first screen, if there are more results it should say, &quot;see more&quot;. Couldn't even see &quot;next&quot;. The # of hits at top of page needs to be bigger. I didn't even notice it.; ** There were two places to search and one didn't work! Light letters, very small and at bottom of screen. I expect search to be at the top.; ** Too many results, too many words, might work better if you had a tree concept - lots of branches for the different topics. **</td>
</tr>
</tbody>
</table>
If you could design this website, what changes would you make and why?

Too much information on a page. Text is too small and it's all green! I want to see a catalog of the paintings in the collection. Give me a reason to go to the museum.; ** Be able to walk through instead of going down a path that doesn't lead anywhere. Make fonts bigger. Make store alphabetical. #1 change - make Search feature much more prominent.; ** Make a more detailed site map with more information for the public and more information about the collection and other resources. I want to know the basics - what's in the museum.; ** Local labels were very light - didn't catch my eye, everything seemed to be the same size, Eyes would go to larger things, Would never have known about big C to get me to home page if I hadn't been shown. Thumbnails could be smaller - didn't realize there was text underneath them. Maybe an alphabetical listing of paintings with a small picture.

IV. FINDINGS AND RECOMMENDATIONS

The significant findings and their criticality are listed below in order of their criticality. Criticality is determined for these findings based on a combination of the severity of the problem rated on a scale of 1 - 4 and the probability that the problem would occur also rated on a scale from 1 - 4. Criticality then is equal to the severity of the problem plus the probability that the problem would occur. The following scales were used to determine severity and probability.

**Problem Severity Ranking**

<table>
<thead>
<tr>
<th>Severity Ranking</th>
<th>Severity Description</th>
<th>Severity Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Unusable</td>
<td>The user either is not able to or will not want to use a particular part of the website because of the way that the website has been designed.</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>The user will probably use or attempt to use the website, but will be severely hampered in his or her ability to do so. The user will have great difficulty circumventing the problem.</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>The user will be able to use the website in most cases, but will have to undertake some moderate effort to get around the problem.</td>
</tr>
<tr>
<td>1</td>
<td>Irritant</td>
<td>The problem with the website occurs only occasionally and can be gotten around easily. Could also be an appearance problem.</td>
</tr>
</tbody>
</table>

**Frequency of Occurrence Ranking**

<table>
<thead>
<tr>
<th>Frequency Ranking</th>
<th>Estimated Frequency of Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Will occur ≥90% of the time the website is used for that purpose.</td>
</tr>
<tr>
<td>3</td>
<td>Will occur 51 - 89% of the time the website is used for that purpose.</td>
</tr>
<tr>
<td>2</td>
<td>Will occur 11 - 50% of the time the website is used for that purpose.</td>
</tr>
<tr>
<td>1</td>
<td>Will occur ≤10% of the time the website is used for that purpose.</td>
</tr>
</tbody>
</table>
1. **Findings and Explanation:**

The process for searching for information about a particular item in the collection is difficult at best and impossible at times. When the user was tasked with finding three Impressionist paintings (a specialty of the Museum’s collection) by French artists, the user first went to Collections on the Global navigation bar, and chose “Search Collections” from that drop-down menu. The result of this action was a “page not found” response. The user then went to the same Global button again, and this time chose “Collection Highlights”. This led to a page with choices in several areas of art: paintings, sculpture, etc. The user would then click on paintings, but only found five listed. Since several of the users rated their knowledge of art as “Uncomfortable in Knowledge”, they were not sure if the two French paintings shown were Impressionists are not. Since they recognized that the words were French, they listed them as answers. However, finding a third choice was impossible for all the users. None of the users found the “Search” word at the bottom of the page without help. After being shown where it was, all the users tried various combinations of the terms French, Impressionist, painters, paintings, but the results that came up, anywhere from 22 to 88 results, did not give them the information they needed in a specific and succinct form. An example page is shown in Appendix I when the search terms “French Impressionist Painters” was used. Also, several of the users did not notice the “Next” link at the bottom of the page. Several expressed concern that the terms “Search” and “Next” were shown in too light of a color (see comments above under # 3)

**Recommendation:**

The Search function on this website is not specific enough for a user to easily find the answer to a simple question. It needs to be completely reexamined in light of this problem. It could (1) possibly be restructured with a better choice of metadata tags, or (2) it could perhaps be eliminated all together if the expertise to enter and maintain the information in the search engine is not readily available to the museum.

(1) Search engine change recommendations include the creation of “search zones” which are essentially virtual baskets that help separate the apples from the oranges in the information. So, for example, there could be a “search zone” for all items that are paintings at the museum, or a “search zone” for Impressionist works at the museum or even a “search zone” for works by Frenchmen. The various items and information in the museum could then be manually tagged or marked in some other fashion which is readable by the search engine. The search engine would look at these “search zones” first and retrieve results based on these basket tags. A more detailed search, if desired, could be conducted if the initial search was not at a dense enough level.
(2) Detailed site map(s) is another option if the maintenance of a search engine is not practical for the museum. This would involve multiple lists, with links, that the user could browse through and choose the areas in which they would want more detail. This would be much more involved than the site map currently available on this website, but it is an alternative method to browse for information, and easily updated by museum personnel using a simple HTML program.

(3) Location of either the search function or the detailed site map(s) mentioned above should also be in a more prominent location. It is recommended that they be at the top of the page, near the right hand side, because many users of websites have come to expect those functions to appear in those areas. In addition, the color chosen for the functions is difficult to see by users. It is further recommended, that instead of the word Search leading to a whole page with just the Search box on it, the Search box itself should be placed on the Home page.

Criticality rating: 8

2. Findings and Explanation:

The user was asked to buy a ticket online for the museum after determining the hours and days the museum was opened. None of the users were able to accomplish this task without help because there was no information on the page where the hours and days of the Museum’s operation were shown that told how to buy a ticket online. The only place on the entire site was on the home page and located almost near the bottom of that page. In some browsers, the information did not even appear on the screen that came up without needing to scroll down the page. Once the users were shown the location of that link, they had little trouble actually ordering a ticket online. However, it was not clear to some that the online ticket purchase was in a different website, and they had left the Carnegie Museum of Art’s website to get their ticket. They were not sure how to get back.

Recommendations:

There are several problems uncovered with this task. They involve 1) proper placement of a link, 2) clarity of a home page link, and 3) acknowledgement to a user when they have left the site that they are on.

(1) The link for ordering a ticket logically should be put on the page where information about the museum’s operating days and hours is located. That would be under the global label, “Info,” and the drop down menu “Visiting the Museum.” A sentence should be inserted that buying a ticket online will take you to an e-ticket website. When the user is ready to return to the Carnegie Museum of Art’s site, to the Home Page, they should click on the Graphic C.
(2) The link on each page to return to the Home Page is the Graphic C. No where in the entire site is the use of the Graphic C indicated as a link to the Home Page. None of the users in this study could figure out how to get back to the Home Page except by clicking on the back button. There is also no Alt tag associated with this graphic for users to give them an idea that this was a Home Page link. Therefore:

- Clarify in some manner that Graphic C is the Home Page link
- Provide an alt tag for Graphic C for screen readers and users who have turned off graphics on their web browsers for quicker access.

(3) Before the user decides to click on the online ordering system, they need to be made aware that they are leaving the CMOA website, and how to return to that site’s Home Page.

Criticality = 7

3. Findings and Explanations:

Several users found it difficult to sort out the information provided on the summer camps because of competing links. Because of the links within the text area itself, several users clicked there first, because that was the natural place for the user’s eyes to go. They did not see the side navigation. They also found it difficult to make decisions about choices of camps because of the layout of the page. They felt that there was too much text that was hard to read, and the formatting was not consistent between the material in the text area and the information on the local navigation bars on the left. Since the link in the body text under the Art and Architecture Camps, showed all the ages listed, the users expected a listing of all the camps in that category when they clicked on the link. However, only the ages 4 - 7 come up. This made it difficult for the user to find their way back to the camps for the older child.

Recommendations:

(1) Although the color of the font chosen was based on the color of the Global Navigation’s link, it is recommended that a deeper color be chosen to help users see the information better.

(2) The information about particular summer camps should only be linked in one spot, in this case, on the local navigation bar on the left side. If multiple instances of the same links are used on the same page, they should be consistent in their description and link to the same pages.

Criticality = 6

4. Findings and Explanations:

Some of the users did not realize when they clicked on a thumbnail sketch that there was more information at the bottom of the pop-up screen. They thought that they were just getting a larger picture of the item they were examining. When the thumbnail is clicked on, the picture opens in another
window the size of a pop-up, but it is not a new screen, so only the top part of the picture can be seen.

**Recommendations:**

(1) On the initial page that holds the thumbnail, instead of saying click to enlarge image, say to click for more information about the image.

(2) When the thumbnail is clicked, it should open in a new screen, not just in a pop-up window. This will eliminate the problem of the user seeing only partial information. They should not be compelled to both see and realize that there is a scroll bar, and then have to use it to get more information about the picture and see the entire larger picture.

Criticality = 6

5. **Findings and Explanations:**

Users were asked to purchase a specific book in the Museum store. Although they were successful for the most part in this purchase, there was a good deal of frustration expressed in attempting to find a particular title because of a lack of organization within the store of items which occurred in a sufficient amount to require scrolling through several screens.

**Recommendation:**

Objects in the store, especially items of which there is a sufficient number such as books or posters, should be presented in a subject or alphabetical listing in the pages.

Criticality = 5

6. **Findings and Explanations:**

Users were asked to find out what was needed to be a volunteer at the Museum. They were frustrated because no information was given as to the kind of training that was required or the time commitment that was necessary to be a volunteer. They were also hesitant to simply send an e-mail to the anonymous “volunteer@ … “ in order to find out more.

**Recommendation:**

Add information to that page giving information on the kind of training required for a volunteer, the kinds of volunteers that are needed, and the possible time commitment required of that volunteer. In addition, there should be an actual person to contact at an e-mail address, rather than an anonymous “volunteer@”.

Criticality = 4
APPENDICES

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Appendix A:

PARTICIPANT BACKGROUND QUESTIONNAIRE

Participant Name: __________________________

Date: __________

The following questions will help us to understand your background and experience.

**Background**

1. Please circle your highest achieved level of education.
   - High School
   - College
   - Graduate

2. If you circled any college, what was/is your major? _______________________

3. What age group are you within?
   - Under 20
   - 20 – 29
   - 30 – 39
   - 40 – 49
   - 50 – 59
   - 60 & Over

4. Approximately how many years have you or did you live in Pittsburgh?
   - 0-2
   - 2-5
   - 5-10
   - More than 10

**Experience**

1. Approximately how many years have you been using the World Wide Web?
   - 0-2
   - 2-5
   - 5-10
   - More than 10

2. How many times a week do you use the World Wide Web?
   - 0-1
   - 2-3
   - 3-5
   - More than 5

3. Have you ever worked visited an art museum’s web site before?
   - Yes
   - No

   If Yes, do you remember which one(s)? _________________________________

4. How do you rate your knowledge level of art?
   - Very Knowledgeable
   - Knowledgeable
   - Somewhat Knowledgeable
   - Uncomfortable in my Knowledge
Appendix B:

USER EXPERIENCE QUESTIONNAIRE (PRETEST) 

Date: _________

Participant Name: _________________________________

Please rate your expertise on each of the following World Wide Web activities:

Browsing a Website for Information using the buttons on the website

☐ Never done  ☐ Novice  ☐ Intermediate  ☐ Expert

Searching a Website for Information using a Search feature

☐ Never done  ☐ Novice  ☐ Intermediate  ☐ Expert

Filling out an online form to register or sign up for something

☐ Never done  ☐ Novice  ☐ Intermediate  ☐ Expert

Ordering an item online

☐ Never done  ☐ Novice  ☐ Intermediate  ☐ Expert

Enlarging a small picture (thumbnail) in order to see it better

☐ Never done  ☐ Novice  ☐ Intermediate  ☐ Expert
Appendix C:

USER EXPERIENCE QUESTIONNAIRE (POSTTEST)  
Participant Name: ____________________________  
Date: __________

Please answer the following questions based on your experience using the Carnegie Museum of Art Website. Where appropriate, please explain your answers in the space provided below the questions.

1. Overall, I found the Carnegie Museum of Art Website easy to use. (Check one.)
   - ☐ Disagree
   - ☐ Somewhat Disagree
   - ☐ Somewhat Agree
   - ☐ Agree

2. I found the following aspects of the Carnegie Museum of Art Website easy to use.
   - ☐ Global navigation (the buttons along the top such as Info, Exhibitions, etc.)
   - ☐ Local navigation (the drop-down menus and the buttons along the left side)
   - ☐ Search feature
   - ☐ Registering for a class
   - ☐ Signing up to be a volunteer
   - ☐ Buying a book from the store
   - ☐ Finding information
   - ☐ Other ____________________________

3. I found the following aspects of the Carnegie Museum of Art Website difficult to use.
   - ☐ Global navigation (the buttons along the top such as Info, Exhibitions, etc.)
   - ☐ Local navigation (the drop-down menus and the buttons along the left side)
   - ☐ Search feature
   - ☐ Registering for a class
   - ☐ Signing up to be a volunteer
   - ☐ Buying a book from the store
   - ☐ Finding information
   - ☐ Other ____________________________

4. I found the words used on the Labels on the global navigation bar (the buttons along the top such as Info, Exhibitions, etc.) clear and logical to understand
   - ☐ Disagree
   - ☐ Somewhat Disagree
   - ☐ Somewhat Agree
   - ☐ Agree

5. I found the words used on the Labels on the local navigation bar (the drop-down menus and the buttons along the left side) clear and logical to understand
6. I found the results of my search (es) easy to sort through to find the information that I needed.

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree

7. I found the experience of filling out a form online to volunteer to be easy.

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree

8. I found the experience of finding something in the Store to be easy.

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree

9. I found the experience of ordering something online from the store to be easy.

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree

10. I found the experience of learning more about a piece of art that was pictured to be easy.

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree

11. I found the experience of Searching for a piece of information to be easy.

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree

12. I found the information given on the site to be useful.

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree

13. I found that the task steps provided enough details to complete the task. (such as shopping online or purchasing tickets).

☐ Disagree  ☐ Somewhat Disagree  ☐ Somewhat Agree  ☐ Agree
Appendix D:

ORIENTATION SCRIPT

1. Participant Greeting and Background
   Hi <participant name>. My name is <test monitor name>, and I will be working with you during today’s session. I am following a script to ensure that all participants receive the same information. Please help yourself to refreshments before we move on to the background form, nondisclosure/consent forms, and pretest questionnaire.

   (Allow time for participants to get comfortable and then give them the “Participant Background” form, the “Non-disclosure and Tape Consent” form, and the “Pretest Questionnaire.”)

2. Orientation
   Now that we have completed the preliminary information, I will explain the basic format of the session.

   Today you will be working with the website of the Carnegie Museum of Art in Pittsburgh, PA. I’ve asked you to join me in helping to identify areas of the website that could use enhancement. We sincerely appreciate your time and value your feedback.

   This session will be audio taped. I will be in the room with you taking notes and timing your tasks. You may ask questions at any time, although I may not answer them in order to simulate a typical environment where a user must rely on the website itself. Remember, please that this test is assessing the functionality of the website and not you as a user.

   I want you to assume the persona of a person who is currently living in Pittsburgh, PA and who has lived there for at least two years. You will be given a set of ten tasks to perform while on the Carnegie Museum of Art’s website. As you are moving through each task, please use the “thinking aloud” protocol, which simply means that I want you to talk through your thoughts and actions not just in your head but also out loud so that I can record them. This technique is very helpful to us in understanding your thinking as you move through the tasks on the website.

   Once you have completed the tasks, we will conclude with a debriefing session that consists of a posttest questionnaire and short interview which will also be recorded.

   Do you have any questions at this point? If not, we can go to the room with the computer and begin.
Appendix E:

DEBRIEFING TOPICS GUIDE

1. You said that overall, you found the Carnegie Museum of Art website _________ to use. (blank filled in from posttest questionnaire. Could you expand somewhat on that statement?

2. You didn’t seem to have any problem placing an order online with the Museum store. Have you ordered things online before? If so, what sites have you used?

3. You mentioned that the labels on the global navigation bar were _______ to use. Would you talk a little more about why you feel that way?

4. You mentioned that the labels on the local navigation bar were _______ to use. Would you talk a little more about why you feel that way?

5. You mentioned that the results of your search functions were _______________. Would you go into a little more detail for me on that experience?

6. You found the information given on the site to be _______________. If you could design this website, what changes would you make and why?
Appendix F:

NONDISCLOSURE AND TAPE CONSENT FORM

Thank you for participating in this website research program. It is imperative that you do not reveal information that you may learn in the course of your participation to other participants. In addition, I will be videotaping your session to allow myself the opportunity to review your session in depth and further benefit from your feedback. Please read the statements below and sign where indicated. Thank you.

________________________________________________________________________

I agree that I will disclose no information to any person, firm, or corporation about the website research program or about the specifications, drawings, models, or operations of any machine or devices encountered until after May 8, 2006.

I understand that videotape and audiotape recordings will be made of my session in order to be evaluated as part of an educational program (ENG 508) at North Carolina State University. I grant Lee Ann Gillen permission to use these recordings for the purposes mentioned above and waive my right to review or inspect the tapes prior to their dissemination and distribution.

Please print name: _____________________________

Signature: _________________________________

Date: ________________

1 Usability test and scenario are for educational purposes only.
Appendix G:

Task Response Sheet

1. What days of the week and what times during the day is the Museum open to the public during the month of April?
   a. Days of the week open: ______________________________
   b. Times during the day: ______________________________

2. How much does it cost to go to the Museum? Using your own age, go ahead and get your ticket up to the point where you have to pay for it online.
   a. Does it cost? ______________________________
   b. How much? ______________________________

3. You particularly like French Impressionist painting. The Museum is supposed to have a collection of paintings by French Impressionist artists. Give the names of three of these painters and the names of their paintings.
   a. Painter 1: ______________________________
   b. Painting 1: ______________________________
   c. Painter 2: ______________________________
   d. Painting 2: ______________________________
   e. Painter 3: ______________________________
   f. Painting 3: ______________________________

4. You have a friend from out-of-town coming to visit you tomorrow. What special exhibits is the Museum currently showing? Name two.
   a. ______________________________
   b. ______________________________
5. Your neighbor’s children, 5 and 12, are looking for some activities to do this summer. Does the Museum have any day camps for children? If so, name two possible choices for each child. They can be half-day or full-day camps. Find the registration form you would need to print. After finding it, you can go on to the next task.
   a. 
   b. 
   c. 
   d. 

6. You would like to buy the book, The Carnegie Museum of Art Highlights, which shows some of the Museum’s collection. Go ahead and put it in your shopping cart. How much is it? How much is the shipping? Go ahead and check out up to the payment window.
   a. Cost of book: 
   b. Cost of shipping: 

7. You are interested in volunteering at the Museum. What do you have to do to become a volunteer?
   a. To volunteer: 

8. You heard about a sculpture called Victory by Saint-Gaudens that the Museum owns. You have heard that it was a model for another statue. Where is that other statue located and who does it honor?
   a. Location: 
   b. Honors: 

9. Andrew Carnegie wanted to collect “Old Masters of tomorrow” for his Museum. What was he talking about?

10. There was an exhibit in the summer of 2002 about one of the neighborhoods in Pittsburgh. Which neighborhood was it?
    a. Neighborhood: 
# Task Log for Usability Test of the Carnegie Museum of Art Website

<table>
<thead>
<tr>
<th>Task Number / Benchmark (min)</th>
<th>Task Description</th>
<th>Time to Complete Task</th>
<th>Help Needed?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 / 2</td>
<td>Days / Hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 / 5</td>
<td>Tickets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 / 10</td>
<td>French Impress.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 / 7</td>
<td>Special Exhibits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 / 8</td>
<td>Day Camps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 / 8</td>
<td>Buy a book</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 / 2</td>
<td>Volunteer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 / 5</td>
<td>Search - Victory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 / 2</td>
<td>History</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 / 2</td>
<td>Past Exhibits</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix I:

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
</table>

Number of documents found: 97. Click on a document to view it, or submit another search.

<table>
<thead>
<tr>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Napoléon LéRuin, arch. and delineator, French, 1821–1901; St. Peter and St. Paul’s Cathedral, Philadelphia, 1903 watercolor on paper</td>
<td>29 3/4 x 17 in. (75.7 x 43.2 cm). Museum purchase, gift of the Duveen Foundation. 71.156.78 The son of French immigrants, who settled in Philadelphia, arch. Napoleon</td>
</tr>
<tr>
<td>Current Exhibitions, Carnegie Museum of Art</td>
<td>Features the current exhibitions at the Carnegie Museum of Art. Also includes several images from each exhibition.</td>
</tr>
</tbody>
</table>

Enter the criteria for a new search.
### TIMINGS OF TASKS FOR (B)

<table>
<thead>
<tr>
<th>Task #</th>
<th>Description</th>
<th>Task Completed?</th>
<th># of errors</th>
<th>Total Time in Minutes</th>
<th>Help Needed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Days and hours museum open</td>
<td>Y</td>
<td>0</td>
<td>1:23</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td>Cost of tickets; purchase online</td>
<td>Y</td>
<td>2</td>
<td>8:56</td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>Find 3 French Impressionist paintings</td>
<td>N</td>
<td>0</td>
<td>stopped at 15:00</td>
<td>Y</td>
</tr>
<tr>
<td>4</td>
<td>Name two current special exhibitions</td>
<td>Y</td>
<td>1</td>
<td>4:38</td>
<td>Y</td>
</tr>
<tr>
<td>5</td>
<td>Find 2 summer camps for a 5-year old and 2 for a 12-year old</td>
<td>Y</td>
<td>0</td>
<td>8:00</td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td>Buy <em>The Carnegie Museum of Art Highlights</em> book from the store</td>
<td>Y</td>
<td>0</td>
<td>9:03</td>
<td>N</td>
</tr>
<tr>
<td>7</td>
<td>Find out what you have to do to be a volunteer</td>
<td>Y</td>
<td>0</td>
<td>1:00</td>
<td>N</td>
</tr>
<tr>
<td>8</td>
<td><em>Victory</em> - model for a larger statue of whom and where is it located?</td>
<td>Y</td>
<td>0</td>
<td>3:23</td>
<td>N</td>
</tr>
<tr>
<td>9</td>
<td>&quot;Old Masters of tomorrow&quot; - what was Carnegie talking about?</td>
<td>Y</td>
<td>0</td>
<td>0:45</td>
<td>N</td>
</tr>
<tr>
<td>10</td>
<td>Neighborhood profiled in special exhibition of summer 2002</td>
<td>Y</td>
<td>0</td>
<td>1:00</td>
<td>N</td>
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### TIMINGS OF TASKS FOR (K)

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<th>Help Needed?</th>
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