Analyzing the Usability of FEMA.gov

Purpose & Problem Statement

The Federal Emergency Management Agency (FEMA) organization has recently redesigned its website - transferring its existing information to a new layout that better suits their audiences. Specifically, the Disaster & Assistance pages have been a point of focus.

Our purpose was to carefully analyze the user experience and provide feedback based on several sources of data: a usability test, a System Usability Scale (SUS) evaluation, a posttest questionnaire, and a reaction cards evaluation. In this document, we will report on how the usability analysis was accomplished, as well as the results from testing participants. Finally, our team has a list of recommendations to fix these issues.

Methodology

This section outlines how the test was performed for each test participant. By following this prescribed methodology, we ensured that we obtained valid and reliable usability findings.

Test Objectives

The objectives of this test were to:

- Examine whether the purpose of the website is clear
- Evaluate whether the website's features and conventions aid the user's experience
- Determine if the website's content is comprehensive and understandable
- Ensure that the website's new layout improves navigability and readability

We will assess these objectives later in this report.

Participants

We were tasked with recruiting government employees and/or emergency managers. To simulate an authentic first-time experience, we tested government employees that were unfamiliar with FEMA and its website. We tested a total of four participants from two demographics: 31-50 years old and 51+ years old.

We tested participants from two different demographics to ensure that we had a diverse sample of participants. Testing two demographics allowed us to better understand the varying needs and expectations of each age group.

Evaluation Methods and Metrics

Our methodology was selected to include multiple methods of data collection resulting in both quantitative and qualitative data. The methods are listed below:

- Usability test
    - Time spent per task
    - Success or failure per task
    - Participant behaviors, actions, and quotes
- System Usability Scale evaluation (Google Form)
- Posttest questionnaire (Google Form)
- Reaction cards evaluation (Google Form)

General Protocol

Each test session began with the moderator or note-taker sending a pre-test email to the participant. The pre-test email included links to the Zoom call, consent form, SUS evaluation, posttest, and reaction cards evaluation. Once the participant joined the Zoom meeting, the moderator began the test session.

The moderator began recording the Zoom meeting once the participant submitted the consent form. After the participant began sharing their screen, the usability test commenced.

After completing the usability test, the participant was asked to complete a System Usability Scale (SUS) evaluation, a posttest questionnaire, and a reaction cards evaluation. Afterward, the participant was thanked for their time, and the test session was concluded. To see the moderator's script, refer to Appendix A.

Tasks and Scenarios

Each participant was asked to complete the following tasks:

Scenario: You are an emergency manager working on the recovery efforts for the Oklahoma Winter Storm that started October 25, 2020.

Task 1: Find out which counties are eligible to receive FEMA assistance for emergency work and replacement of damaged buildings.

Scenario: You work in a mayor's office in Clarke county.

Task 2: Find out if you are eligible to receive money to help support city-wide recovery activities.

Scenario: You are a member of a Congressional oversight committee reviewing federal grants for Hurricane Laura in Louisiana.

Task 3: Find out how much Public Assistance grant money FEMA has spent.

Scenario: You're helping get FEMA information to community members affected by Hurricane Laura that speak Spanish as their primary language. Where can you find information about this disaster in Spanish?

Task 4: Find out where you can find information about this disaster in Spanish.

Scenario: You are representing survivors of the Oregon Wildfires in September 2020.

Task 5: Find out more about that disaster.

Findings

As mentioned before, this study was crafted from four testing objectives. We have condensed those objectives to four areas of emphasis: navigation, consistency and clarity, visibility/identity, and accessibility. In this section, we detail those findings in these specific areas. The four areas are ordered by importance or level of severity.

One thing to note is the score from the SUS evaluation. The national average score is 68, which indicates a balanced user experience. However, this study warranted a score of 64, which translates to a below-average user experience. As you will see in the following subsections, this score does not align with the findings from this first sprint, but it may support information in later sprints. Refer to Appendix C for the SUS analysis.

Our team used reaction cards as a post-test evaluation which consisted of 16 different adjectives that the participant could choose that described their overall experience with FEMA.gov. The top five adjectives used to describe the website were all positive. As shown in Figure 1 below, the top adjectives chosen were: consistent, meaningful, straightforward, professional, and easy-to-use. Refer to Appendix E for the entire reaction card evaluation.

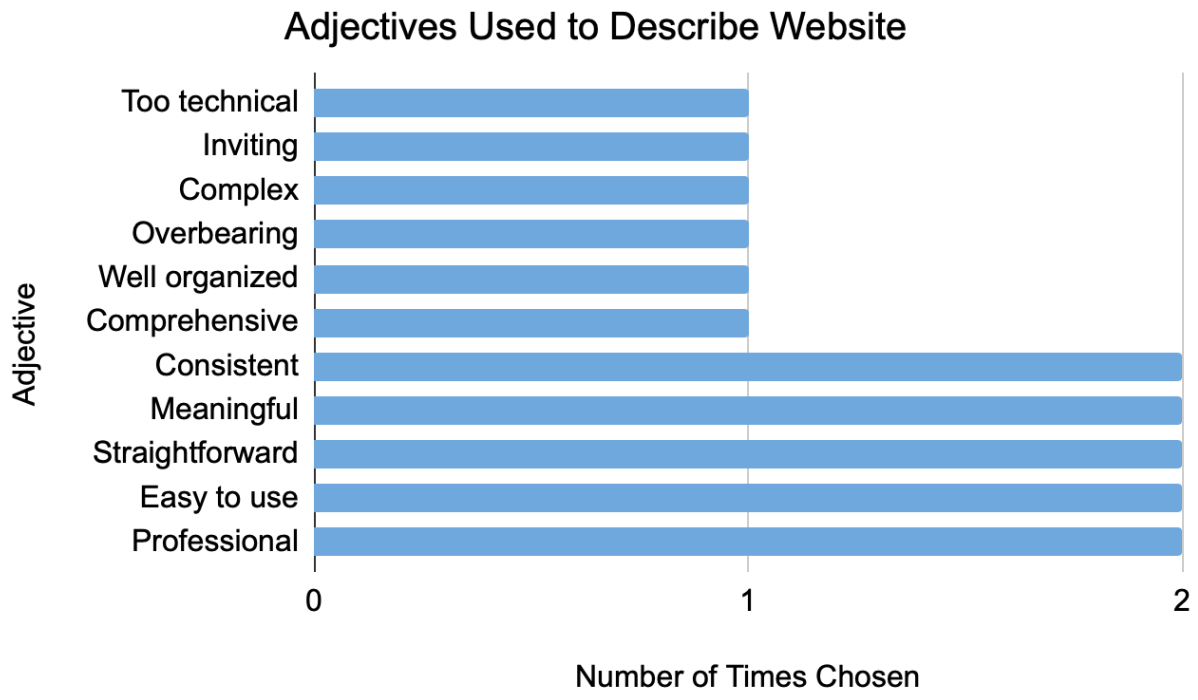

Figure 1. Adjectives Used to Describe the Website

Navigation

The only area of emphasis that was not strongly positive was navigation. While participants reported that the overall navigation was well, there were certain areas that did not receive praise - primarily the menus.

One of the words that were selected in the reaction cards exercise was overbearing. When asked why the participant selected this word, he referred to task 2 in which no one was able to complete. This was his statement regarding the homepage menu:

"There was a lot of info once you got into the tabs. I had to try to figure out the content. [There were] too many tabs and too much info. [They] should have major info upfront on the homepage."

This was one of the only comments about the homepage, but that was expected because most of the participants referred to the search when assessing the navigation. In two of the SUS questions regarding complexity and prior knowledge required, a participant mentioned that the search bar made it easier to navigate. If we were to eliminate the search bar from the tasks, we might have received more valuable information about the menus.

Consistency & Clarity

In the SUS evaluation, the posttest questionnaire, and the reaction cards exercise, the choices that included the words consistency and straightforward received positive reactions. One participant made an interesting comment about the site's consistency. They stated that, "if you knew what disaster you were looking for, it would take you to the source available." This means that the site matched users' expectations, mostly.

We say mostly because of a comment made about the site's search feature, which was a commonly used tool throughout this study. In task 5, the participant was asked to find information about the Oregon Wildfires. While they were able to successfully complete this task, they mentioned that they expected different results. The first link leads to an external YouTube video. The participant explained that she expected a document that would be hosted on the internal site instead of an external video.

When answering questions about the site's verbiage, participants stated that it was "very clear" and that they "didn't have problems with the wording." However, this did not align with our analysis of the site's navigation - which we will discuss later.

Visibility/Identity

When assessing the visibility/identity, the participants reported positive reactions across the board. They recorded posttest questionnaire responses regarding the site's purpose, content readability, content relevance, and trustworthiness. Each question received a positive average score, with trustworthiness being the highest (4.5) and content relevance being the lowest (3.25). However, there were no comments that explained the content relevance scores, so we cannot provide recommendations in this area. Refer to Appendix D for the posttest analysis.

Specifically, the translation feature also was an area of success. In task 5, we asked participants to find information about a specific disaster in Spanish. Not only did each participant successfully complete this task, but it also reported the shortest average time of all of the tasks at 64.25 seconds. Providing a language tab at both the top of the site and the bottom of disaster subpages proved to be beneficial to users. See Appendix B for more tasks metrics.

There was only one somewhat negative comment regarding the color of the site. He stated that there was "not much color" but that it "didn't matter to him." We assume that because FEMA is a government website, too much color could portray an unprofessional, child-like site. Therefore, its current state is suitable.

Accessibility

Much like the visibility/identity section, participants reported positive results for the site's accessibility. We did not notice any bugs or issues that interfered with the participants' testing.

When asked were participants able to access the major portions of the website from the homepage, they scored an average of 4.5 out of 5.

One participant mentioned that the site "did take a little while to load." She then credited this to her own network capabilities, but it may be something to look into.

Recommendations

With the findings reported, we will now recommend some actions to further enhance the user's experience.

1. Use drop-down menus within each category.

As reported earlier, a participant felt that the navigation menus were overbearing and contained a lot of text. Therefore, use drop-down menus within each category (see Figure 2). Specific categories are great, but when the user is unsure about what they are looking for, they may feel that their results do not relate to such specific groups.

Figure 2. Drop-down Menu Mockup

This recommendation is not only for the Disaster & Assistance submenu. When the participant commented on the overbearing menus, he was navigating back and forth between the Disaster & Assistance and Emergency Management tabs. A more concise menu layout would encourage a less intimidating experience.

2. If possible, implement a more specific search engine.

When completing tasks, participants would listen for keywords and use those in the search bar. However, rather than combining the keywords into one search, the search engine produced

multiple results from each word that was searched. To alleviate this issue, we recommend a more specific search engine.

Many of us are aware of Google's advanced search feature, but that type of renovation is not necessary. Rather, a filter feature would serve the desired purpose (see Figure 3). Possibly adding filters for dates or specific states would help narrow down the search results and greatly improve the user experience.

Figure 3. Search Page with Filter Feature Added

3. Create a subheading about wildfires under the Disasters & Assistance tab

We observed that several of the participants tried to locate the wildfire information from the Disasters & Assistance tab. The participants assumed that since the various hurricanes were listed under that tab, the Oregon wildfire would be listed there as well. They were disappointed that it was not there. As a result, our third recommendation is to make *wildfires* a subheading under the Disasters & Assistance tab. This new subheading will provide users with a longer list of choices to choose from. Displayed below in Figure 4 is a mockup of the wildfire subheading.

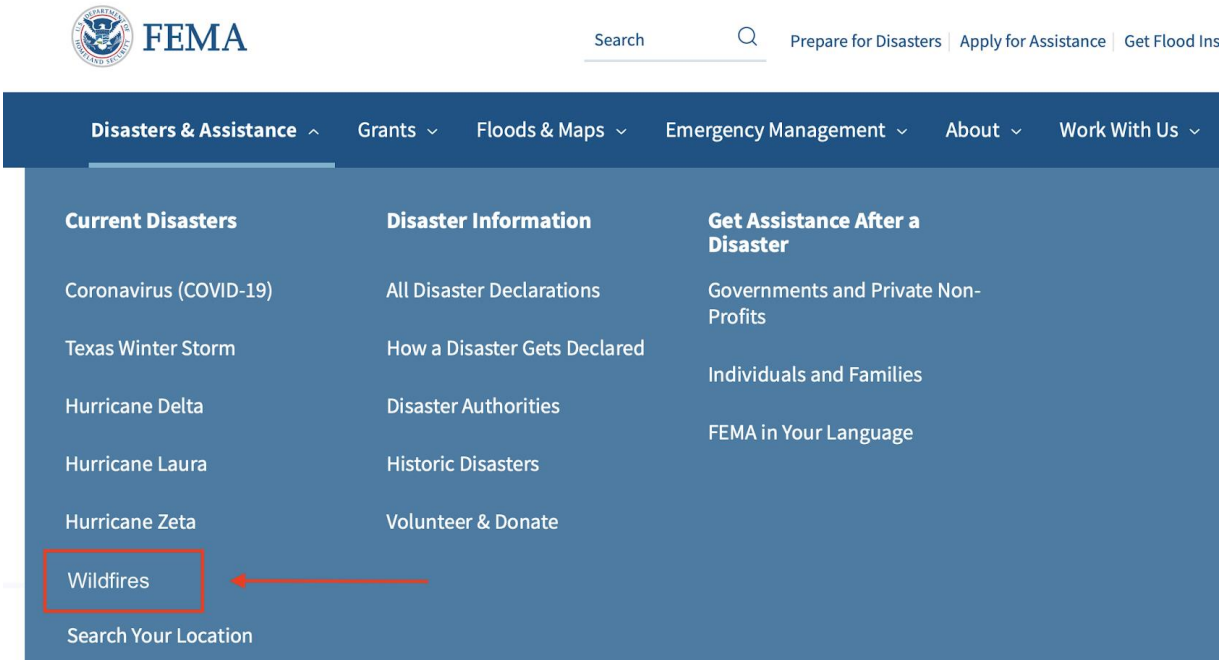

Figure 4. Wildfire Subheading Mockup

4. Create simpler tasks for the participants

While this recommendation does not involve the website, it is very important to address it for the duration of this study. The participants often asked that we would recite the tasks and scenarios to be sure of what they were completing - one going as far as to write down the tasks.

There is a lot of information that can come from these tasks, but if the participant is lost in the wording, we miss out on the potential results.

Conclusion

In closing, we believe that FEMA provides its audience with accessible, relevant, and visible information. However, there are a few problem areas that inhibit the site from creating an optimal user experience. By analyzing our findings and recommendations, the FEMA site will welcome and retain visitors more effectively. We look forward to the FEMA team's adjustments and the next testing sprint.

Appendix A: Moderator's Script

This script was adapted from (Barnum, 2011, pp. 193-195).

Introduction

Hello! Thank you for being here with us today.

My name is Jeremy. Sydnei and I are here to evaluate the usability of a government site. For your information, I am reading from a script to ensure I say the exact same thing to each participant and to ensure that nothing is skipped or missed.

Your participation will help us understand what changes should be made to develop an informative, usable website.

Video Recording Permission

This session will be recorded. The reason for recording the session is so that we can collect additional data after the test. Please complete the legal consent form to give us permission to record your use of the site. If you have any questions, please feel free to ask.

(Start Zoom recording.)

Introduction to Testing

Before we begin, I will explain how this test will work.

I will ask you to view a government site and give you tasks to complete. I really appreciate your feedback about your experience, so I would like you to think aloud as you navigate the site. You may want to say things like, "I'm clicking this because…" or "I don't like this because…".

Additionally, this test is meant to evaluate the website, not your abilities. You do not need to know anything about the website beforehand.

Do you have any questions before we begin?

In the center of the Zoom toolbar, there is a large green button that says "share screen." Please click that. Now there will be an option asking which screen you would like to share; please share whichever display you will be using (ie. desktop/screen 1).

Additionally, please tell me which browser you are using.

Thank you. Please navigate to www.FEMA.gov.

Testing

I have several tasks for you to complete as we go through the site. Remember, this is not a test of you; it is a test of the website, and I'm very interested in your reactions to it. Please remember to think out loud.

Scenario: You are an emergency manager working on the recovery efforts for the Oklahoma Winter Storm that started October 25, 2020.

Task 1: Find out which counties are eligible to receive FEMA assistance for emergency work and replacement of damaged buildings. Let me know when you think you have completed the task.

Please return to FEMA.gov.

Scenario: You work in a mayor's office in Clarke county.

Task 2: Find out if you are eligible to receive money to help support city-wide recovery activities. Let me know when you think you have completed the task, and do not forget to think aloud.

Please return to FEMA.gov.

Scenario: You are a member of a Congressional oversight committee reviewing federal grants for Hurricane Laura in Louisiana.

Task 3: Find out how much Public Assistance grant money FEMA has spent. Let me know when you think you have completed the task, and do not forget to think aloud.

Please return to FEMA.gov.

Scenario: You're helping get FEMA information to community members affected by Hurricane Laura that speak Spanish as their primary language. Where can you find information about this disaster in Spanish?

Task 4: Find out where you can find information about this disaster in Spanish. Let me know when you think you have completed the task, and do not forget to think aloud.

Please return to FEMA.gov.

Scenario: You are representing survivors of the Oregon Wildfires in September 2020.

Task 5: Find out more about that disaster. Let me know when you think you have completed the task, and do not forget to think aloud.

Thank you for your feedback. We have a few extra forms for you to fill out in order to help us gather some more data.

SUS Questionnaire

Please go to the SUS questionnaire form. This will help us understand your experience with this website. Additionally, please explain why you are choosing each answer.

Posttest

Please go to the posttest form. For each of the thirteen statements, mark one box that best describes your reaction. In addition, please explain why you are choosing each answer.

Reaction Cards

Please go to the reaction cards form. This form contains sixteen different words that may be used to describe FEMA.gov. Please choose four words from the list that you would use to describe your experience with the site, and please elaborate on why you chose those words.

After Testing

Thank you for participating in this test! We really appreciate your feedback, and we hope you have a wonderful day.

Appendix B: Tasks Metrics

Table 1: Time Spent on Each Task & Success Rate

	#1	#2	#3	#4	Average*
1: Find out which counties are eligible to receive FEMA assistance for emergency work and replacement of damaged buildings.	:43	1:06	5:15	5:19	3:05
	success	success	**failure**	**failure**	2/4
2: Find out if you are eligible to receive money to help support city-wide recovery activities.	3:42	2:14	3:23	3:24	3:10
	failure	**failure**	**failure**	**failure**	0/4
3: Find out how much Public Assistance grant money FEMA has spent.	2:52	1:02	5:09	5:26	3:37
	failure	success	**failure**	**failure**	1/4
4: Find out where you can find information about this disaster in Spanish.	1:35	1:06	:49	:47	1:04
	success	success	success	success	4/4
5: Find out more about that disaster.	1:28	:40	5:23	1:27	2:17
	success	success	success	success	4/4

*Averages are calculated by adding up the number of successes/six participants

Research shows that users tend to spend an average of 45 seconds on any website, so that should be considered the expected amount of time. With that in mind, the average time spent on the FEMA website for each task is well over 45 seconds. The following list indicates how much longer participants took in contrast to the average time:

- Tasks 4 took a little less than twice the expected amount of time.
- Tasks 5 took three times the expected amount of time.
- Tasks 1, 2, and 3 took more than four times the expected amount of time.

All four participants failed the second task because they all searched Clarke County in the search bar and expected the correct information to appear.

Appendix C: SUS Survey

Table 2: Notable SUS Statements

Notable SUS Questions	**1** **(Strongly disagree)**	**2** **(Disagree)**	**3** **(Neutral)**	**4** **(Agree)**	**5** **(Strongly agree)**
I found the website unnecessarily complex.	1 participant	1 participant	1 participant		1 participant
I found the various functions in this website were well integrated.	1 participant		2 participants		1 participant
I would imagine that most people would learn to use this website very quickly.	1 participant			1 participant	2 participants
I felt very confident using the website.	1 participant		1 participant		2 participants
I needed to learn a lot of things before I could get going with this website.	1 participant	1 participant	1 participant		1 participant

The one participant who answered “strongly disagree” to “I found the website unnecessarily complex” stated that they felt “the search bar was easy to navigate” (Participant 2, 51+).

One of the participants who answered “strongly agree” to “I would imagine that most people would learn to use this website very quickly” stated, “yes, if the person is affected by a disaster” (Participant 4, 31-50).

The one participant who answered “strongly agree” to “I needed to learn a lot of things before I

could get going with this website" stated, "[he] needed to pay more attention " (Participant 4, 31-50).

Table 3: SUS Scores by Age Group

Age Group	SUS Score	Average by Age Group
31-50	45	57.5
	70	
51+	60	71.25
	82.5	
Total Average		64.375

The standard average system usability scale (SUS) score is 68. Scores above this mean that the website has a higher than average usability level, and scores below this indicate that the website has lower than average usability. Our average SUS score was 64.375, which indicates that FEMA's Disaster and Assistance website has a lower than average usability level.

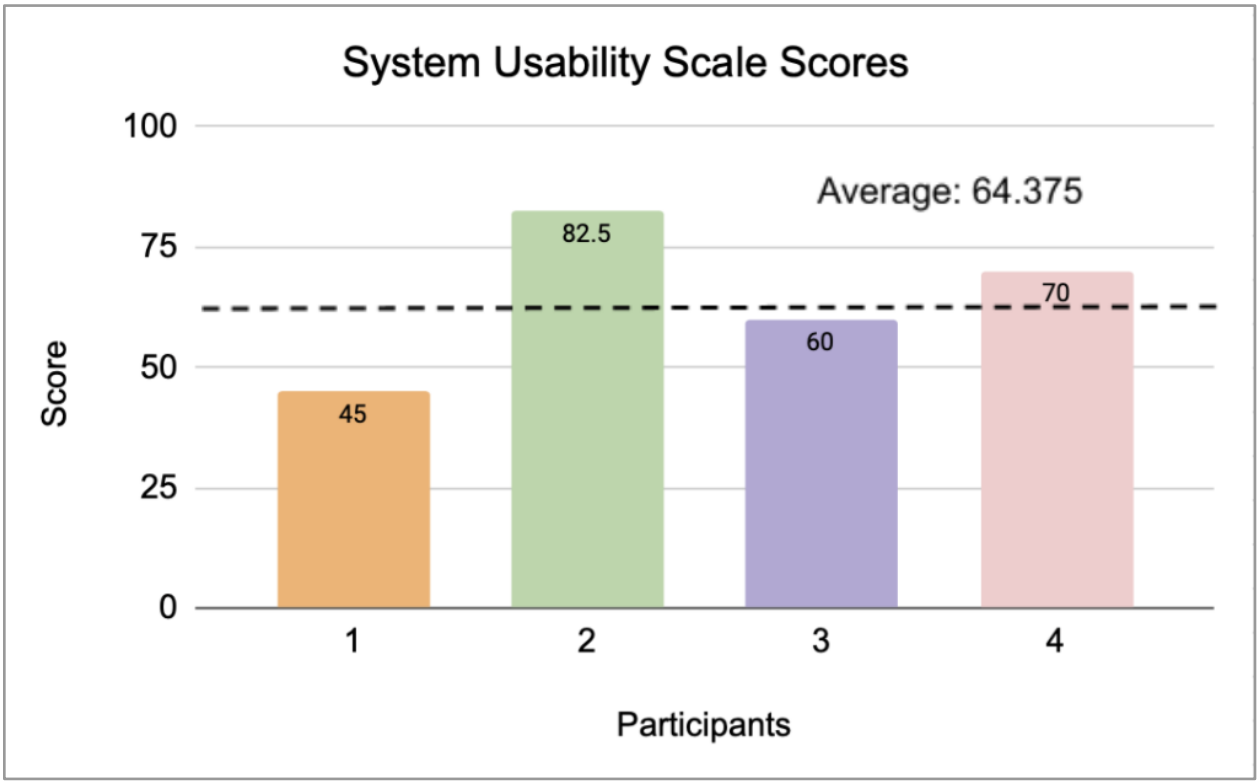

Figure 5. SUS Scores

Appendix D: Posttest Questionnaire

Ratings were quantified as follows: ratings of “strongly disagree” are equivalent to a 1, ratings of “disagree” are equivalent to a 2, ratings of “neutral” are equivalent to a 3, ratings of “agree” are equivalent to a 4, and ratings of “strongly agree” are equivalent to a 5.

The orange columns represent the 30-50 age group, and the green columns represent the 51+age group

Table 4: Posttest Analysis by Age Group

	#1	#2	#3	#4	Average
I found the search results to be clear, accurate, and relevant.	4	3	2	5	3.5
I thought the purpose of the website's information to be clear.	4	3	4	5	4
I found the content to be readable and easy to understand.	4	3	4	5	4
I found the content to be engaging and relevant to the topic given.	2	4	2	5	3.25
I feel this website can be trusted.	5	4	4	5	4.5
I thought the website loading time was reasonable.	5	3	4	5	4.25
I was able to access the major portions of the website from the homepage.	5	4	4	5	4.5
I thought the site had appropriate contrast in text size and color.	3	4	4	5	4
I found the pages to have a consistent layout.	5	4	4	5	4.5
I thought the website's features were conventional.	3	4	4	5	4
I thought the wording was clear and understandable.	5	4	4	5	4.5
I found the pages to be easy to navigate.	2	4	4	5	3.75

I thought the content aligned with my expectations on each page.	3	3	2	5	3.25

The two lowest average scores were for the statements, “I found the content to be engaging and relevant to the topic given” and “I thought the content aligned with my expectations on each page.” This means on average the participants were neutral about those statements.

There were two other averages that were also neutral. The statements were, “I found the search results to be clear, accurate, and relevant” and “I found the pages to be easy to navigate.”

Appendix E: Reaction Cards

Table 5: Top Five Chosen Reaction Cards

Words Chosen	# of Times Chosen	Quote
Consistent	2	"If you knew what disaster you were looking for, it would take you to the source available."
Easy-to-use	2	"Once I knew what I was looking for, it was easy to find the answer." "Pretty simple to use."
Meaningful	2	"The info presented was meaningful information because it provided a lot of details. It also provided other resources."
Professional	2	No explanation given
Straightforward	2	"When I typed the question in the search bar, I was able to find it." "Tabs were there, but the info I found was not the answer I wanted."

Table 6: Negative Reaction Cards Chosen

Words chosen	# of Times Chosen	Quote
Complex	1	No explanation given
Overbearing	1	"There was a lot of info once you got into the tabs. I had to try to figure out the content. Too many tabs and too much info. There should be major info upfront on the homepage. Also, the search results should be more specific."
Too technical	1	No explanation given