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. Additionally, this study followed the agile methodology with one sprint of testing preceding and following an in-between stage of implementation: totaling three sprints.

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 three participants from two demographics: 31-50 years old and 50+ 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.

FEMA's implementation sprint involved user acceptance testing, which incorporated the recommendations from the previous sprint of testing into a prototype site. This site required ongoing maintenance, so the new testing phase coincided with the implementation sprint, and our team used FEMA's updated user acceptance site to test participants. Our FEMA partners provided participants with access to this internal prototype via Zoom and monitored the sessions as the moderator guided participants through the scenarios and exercises.

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 into four areas of emphasis: navigability, visibility, and comprehensibility. In this section, we detail those findings in these specific areas. The three 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 60.83, which translates to a below-average user experience. Refer to Appendix C for the complete SUS analysis.

Our team used reaction cards as a post-test evaluation which consisted of 16 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 professional and comprehensive. Refer to Appendix E for the entire reaction card evaluation.
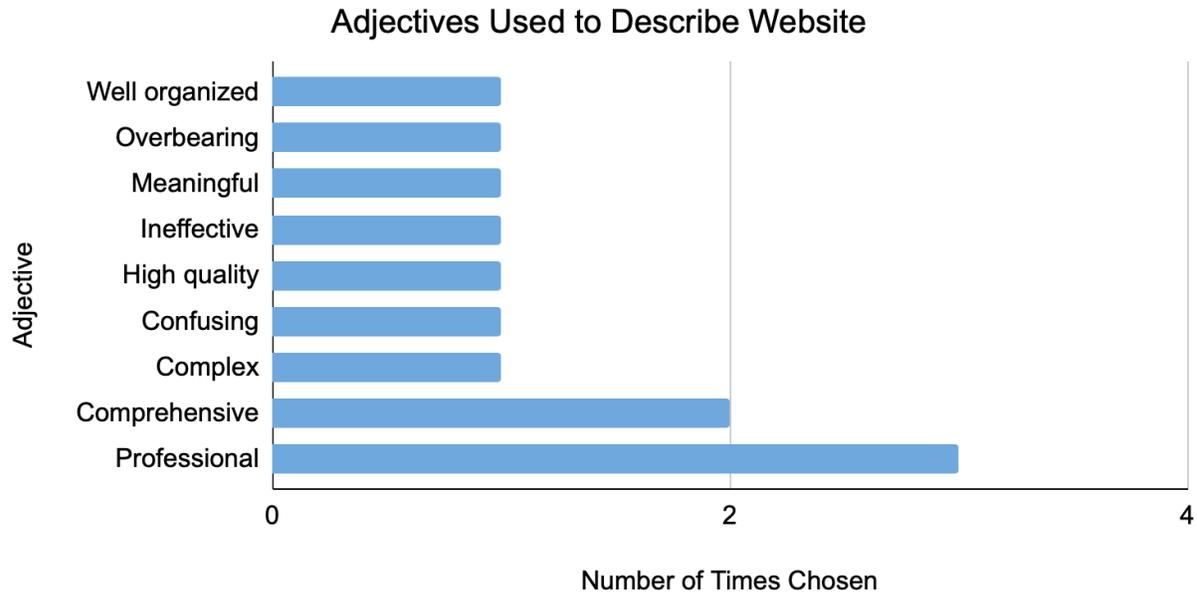
Adjectives Used to Describe Website

Figure 1. Adjectives Used to Describe the Website

Navigability

As with any site's menu, FEMA's navigation menu is designed to provide shortcuts and create a more efficient experience overall. However, when assessing the sessions and exercise data, this feature seemed to cause some confusion.

In task 3, participants were asked to find public assistance grant money for a specific disaster. Of the three, two participants immediately referred to the grants tab to complete this task - although the correct path was through disasters & assistance. Along with those two participants failing to reach the desired result, this task recorded the longest average time spent at four minutes, forty-seven seconds. It is also important to note that the one participant that completed this task claimed to have some prior knowledge of the FEMA site.

Relating to this finding, participants reported their sentiments in the post-test activities. One of the more interesting comments pertained to the search bar:

"[The tasks were] a little challenging depending on what you were looking for. The disaster tabs don't give you exactly what you're looking for. I had to use the search bar more."

This participant also felt that the site was not user-friendly, stating that the "intent" was clearly there with menus upfront, but she found herself digging for information.

Visibility

When assessing the visibility, the participants reported positive reactions to the website. 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, readability, and relevance being the highest (3.7) and the website's purpose being the lowest (3.3).

Regarding the website's purpose, one of the participants stated, "Since FEMA is in the public, we know their intent. However, their website is not clear about their purpose."

In regards to the content's readability, a participant stated, " Once I was able to get what I was looking for, I thought it [the website] was okay, but that is only after I found the answer." The participant further explained how she would get frustrated and leave the website if she had to use it during an actual emergency. Refer to Appendix D for the complete posttest analysis.

Comprehensibility

The site's terminology also led to some interesting findings. In completing the tasks, participants seemed to struggle with the more FEMA-specific terms. The participant with prior knowledge of FEMA mentioned the event of newcomers exploring the site. He felt that these newcomers might have difficulty accomplishing some desired task - considering the amount of prior knowledge required to find specific information. He also selected the term "overbearing" in the reaction cards exercise, as he felt that users would be overwhelmed when exploring the site in the midst of a recent disaster.

In other words, there seems to be a disconnect between the intended audience and the actual audience. As an emergency site, the information should be straightforward. However, the site's complexity is more tailored for employees than those that require assistance.

Recommendations

With the findings reported, we will now recommend some actions to further enhance the user's experience. These three recommendations are also ordered by importance.

1. Clearer Headings

This recommendation is a difficult but necessary one, as participants seemed to be confused about where to find information. As an emergency management agency, it may be second nature to quickly differentiate between emergency management, disasters & assistance, and floods & maps. However, the ideal users of FEMA may not recognize the difference in these terms. Therefore, we recommend that the navigation menu headings be more strict and less inclusive.

By grouping all relative information under one distinct heading, users will be less likely to second guess and wonder where to click for specific information. This also means possibly removing the ampersand from the *disasters & assistance* and *floods & maps headings*. One term would be a more direct and simple heading that helps users decide whether that tab relates to their issue.

2. Change Declared Disaster Incident Type from "Fire" to "Wildfire"

When making a selection from the Declared Disasters search feature, a participant needed to select the incident type. While choosing the incident type, the participant was explicitly looking for the word wildfire. He found the word fire instead of wildfire. He stated, "this should be called wildfire instead of just fire. I see how this could confuse some people." To alleviate this issue, we recommend simply changing the wording. Shown in Figure 2 below is a mockup of the revised incident option.

Figure 2. Updated Incident Type Option

3. Place the Assistance Charts under Grants

As reported in task 3, participants had a difficult time locating the public assistance grant money. They assumed that because the term "grant" was included in the task that the results would be located in that tab.

To align more with users' expectations, we recommend placing a *funding obligations* subheading within the grants tab. This may not align with the FEMA protocol, but as a newcomer, users would expect that all money-related issues be gathered in one succinct location. See Figure 3 for a potential layout.
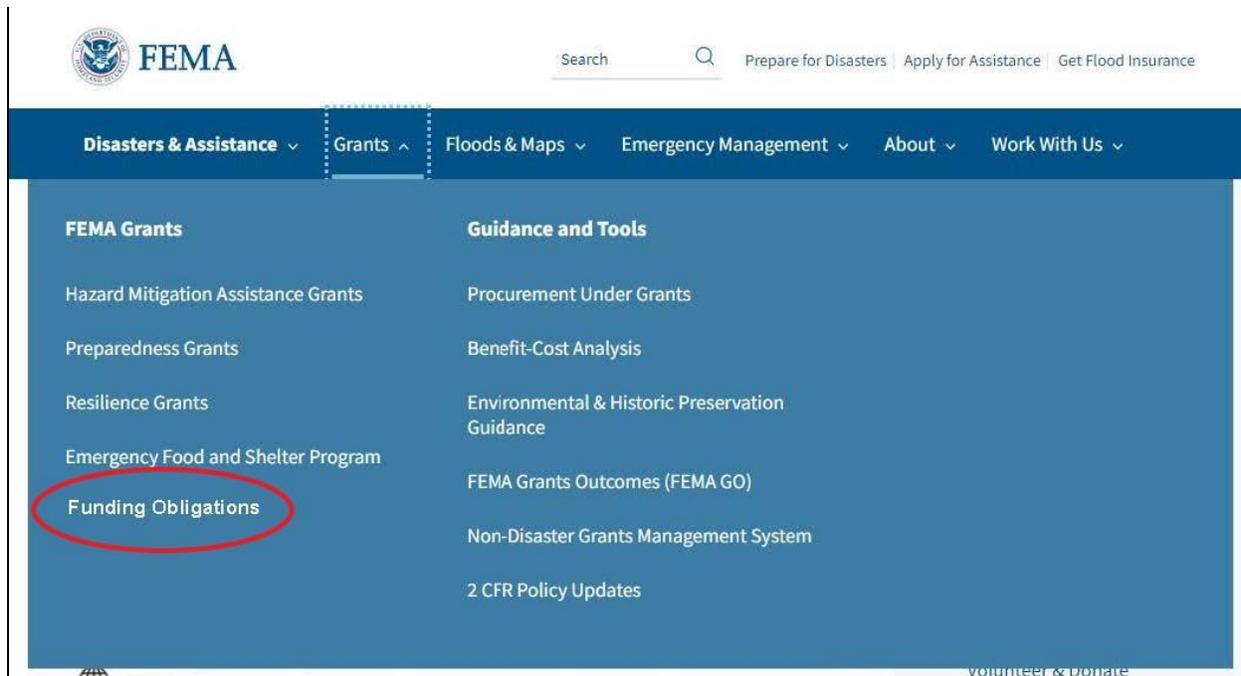
Figure 3. Funding Obligations Under Grants

Conclusion

In closing, we believe that the updates that were suggested in the first testing cycle have paid off. While there are still a few more improvements that need to be made, the FEMA website is overall professional and comprehensive. 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.

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 (Appendix D)

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?

Tell FEMA: Can you please share your screen of the FEMA webpage?

Tell FEMA: Thank you.

Tell Participant: Okay. At the top of your screen, you should see a green box that says, "You are now viewing blank's screen." Click the box beside it that says "View Options" and select the option that says "Request Remote Control." Let me know once you have clicked it.

Tell FEMA: We can take the test from here. We will let you know when we're done.

Tell Participant: Now that you have taken control of the screen, please tell me which browser you are using.

Thank you.

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 about 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.

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 (Appendix E)

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 (Appendix F)

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 (Appendix G)

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	Average*
1: Find out which counties are eligible to receive FEMA assistance for emergency work and replacement of damaged buildings.	1:39	1:56	:34	1:23
	success	success	success	3/3
2: Find out if you are eligible to receive money to help support city-wide recovery activities.	5:22	3:05	:32	3:00
	success	success	failure	2/3
3: Find out how much Public Assistance grant money FEMA has spent.	1:58	7:11	5:14	4:47
	success	failure	failure	1/3
4: Find out where you can find information about this disaster in Spanish.	1:11	2:43	:55	1:36
	success	success	success	3/3
5: Find out more about that disaster.	2:39	:59	:49	1:29
	success	success	success	3/3

*Averages are calculated by adding up the number of successes/three 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 1 and 5 took a little less than twice the expected amount of time.
- Task 4 took two times the expected amount of time.
- Tasks 2 and 3 took more than four times the expected amount of time.

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 very cumbersome to use.		2 participants	1 participant		
I would imagine that most people would learn to use this website very quickly.		2 participants	1 participant		
I found the various functions in this website were well integrated.			3 participants		
I felt very confident using the website.		1 participant		2 participants	
I thought the website was easy to use.			2 participants	1 participant	

The one participant who answered, "neutral" to "I found the site very cumbersome to use" stated that "it depends on what they're looking for" (Participant 3, 50+).

The one participant who answered, " disagree" to "I felt very confident using the website" stated she, "felt more confident using the search bar" (Participant 3, 50+).
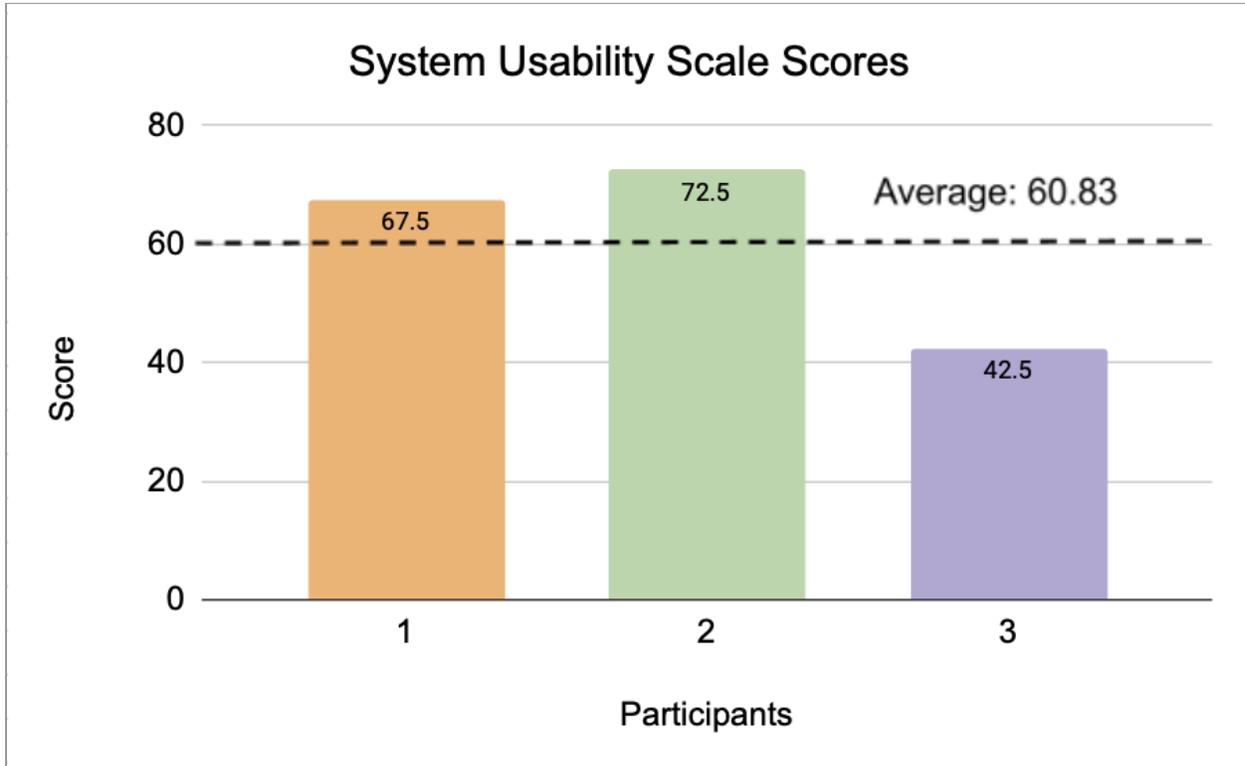
Figure 5. SUS Scores

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 60.83, which means that FEMA's Disaster and Assistance website has a lower than average usability level.

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.

Table 3: Posttest Analysis

	#1	#2	#3	Average
I found the search results to be clear, accurate, and relevant.	3	4	3	3.3
I thought the purpose of the website's information to be clear.	4	5	1	3.3
I found the content to be readable and easy to understand.	4	4	3	3.7
I found the content to be engaging and relevant to the topic given.	4	4	3	3.7
I feel this website can be trusted.	4	5	2	3.7
I thought the website loading time was reasonable.	3	5	3	3.7
I was able to access the major portions of the website from the homepage.	4	4	3	3.7
I thought the site had appropriate contrast in text size and color.	4	5	4	4.3
I found the pages to have a consistent layout.	4	5	4	4.3
I thought the website's features were conventional.	3	5	4	4
I thought the wording was clear and understandable.	4	5	3	4
I found the pages to be easy to navigate.	2	4	3	3
I thought the content aligned with my	2	4	2	2.7

expectations on each page.				

The two lowest average scores were for the statements, "I found the pages to be easy to navigate" and "I thought the content aligned with my expectations on each page." This means, on average, the participants were neutral about those statements.

Appendix E: Reaction Cards

Table 4: Reaction Card Analysis

Notable Words Chosen	# of Times Chosen	Quote
Professional	3	"[The site] had a very professional feel."
Comprehensive	2	"There is a lot of info in there. It seemed to have info of each of the areas you need."
Ineffective	1	"It depends on what you're looking for. If you are comfortable with this site on a regular basis, then it's fine."
High Quality	1	"[There are] a lot of maps and stuff."
Complex	1	"It depends on what you're looking for."