

Usability Test Report: Premortem Application

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For:

CS5760 Usability in HCI

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Executive Summary

Overall, the usability test performed on the premortem web application as well as the heuristic evaluation highlighted many areas for potential improvement. The premortem is a tool that can be used within teams to help forecast their plan or idea. It's quite easy to become overconfident in your idea or plan when you only work within your own team. This overconfidence can cause people to not look outside their small bubble. The premortem allows teams to reduce overconfidence with their plan by forcing team members to think of reasons why the plan could fail. After generating reasons for failure, they are then tasked with ideating solutions for those reasons of failure. The premortem is just a strategy that allows the project team to work backwards from failure to determine the reasons for that failure. By doing this, teams are able to revise their original plan to account for these possible failures and therefore decreasing overconfidence and building a stronger plan before it is even implemented. This is what the premortem web application was designed to facilitate. There were a total of 7 users who completed a total of 2 tasks during the moderated usability test over Zoom. The results from the usability test showed that the overall information layout was confusing for users with many users not reading the instructions as intended. Users had difficulty recognizing which step they were on and were unable to locate the timer. However, this confusion was not translated into dissatisfaction with the application. Satisfaction was measured by using Lewis's (1992) post-study satisfaction questionnaire. Users were overall quite satisfied with the premortem application with an average of 5.28 on a seven-point scale. The results of this usability test helped develop new design change recommendations and will be discussed within this test report.

Introduction Full Product Description

The Premortem Web Application

<https://hci-dev.cs.mtu.edu:8144/simplepremortem/facilitator/index> → (*facilitator link*)

<https://hci-dev.cs.mtu.edu:8144/simplepremortem/team/index> → (*team member link*)

- This application is designed to facilitate the premortem process either in person or virtually.
- Users can be students, project leaders, team members, employees, faculty, and community members.

Test Objectives

This evaluation was an attempt to discover possible areas for improvement, satisfaction, and if users find that the application does what it is supposed to do.

The assigned tasks were designed to cover the entirety of the premortem process. However, there were a few features of the application that were not working at the time of testing, so they were unable to be tested (vote/delete buttons).

The facilitator task consisted of:

1. Review the material (Texas or Michigan)...(I will send in Zoom chat box...link to google doc)
2. Please conduct a premortem as a facilitator by following the instructions. (Colin/Richard/Dominic/Scott/Jonah will be your teammate)

The team member task consisted of:

1. Review the material (Texas or Michigan)...(I will send in Zoom chat box...link to google doc)
2. Follow the facilitator's instructions.

Method Participants

- Testing participants (n=7); all participants were undergraduate students
- Six participants reported no prior experience with project planning tools or software and one participant reported using Trello.
- Participants were selected by convenience sampling
- The participant sample does represent true users of the application.

	Gender	Prior Experience with Premortem	Currently Use any Project Tool or Software (If yes, what)
Participant 1	Female	No	No
Participant 2	Female	No	No
Participant 3	Male	No	No
Participant 4	Female	No	No
Participant 5	Female	No	No
Participant 6	Female	No	Yes, Trello
Participant 7	Male	No	No

Tasks

Task (As Facilitator)

1. Review the material (Texas or Michigan)...(I will send in Zoom chat box...link to google doc)
2. Please conduct a premortem as a facilitator. (Colin/Richard/Dominic/Scott/Jonah will be your teammate)
3. After task completion, debrief will occur

Task (As Teammate)

1. Review the material (Texas or Michigan)...(I will send in Zoom chat box...link to google doc)
2. Follow the facilitator's instructions
3. After task completion, debrief will occur

**Facilitator and Teammate assignment were counterbalanced across all participants

- After both tasks were completed by the participant they were then given the post-study satisfaction survey to complete.

Test Facility

- The evaluation was conducted remotely, the participants completed the tasks in their own home environment.
- The session was recorded and evaluated using Zoom® online meeting room.

Test Administrator Tools

The evaluation was conducted and recorded through Zoom®.

Participants were asked to share their screens.

Experimental Design

Conditions Legend (Counterbalanced)

- A. Facilitator-Texas, Team member-Michigan
- B. Facilitator-Michigan, Team member-Texas
- C. Team member-Texas, Facilitator-Michigan
- D. Team member-Michigan, Facilitator-Texas

Facilitator first: A, B → code order 1

Team Member first: C, D → code order 2

Monday 4/12 (Richard & Colin)	Tuesday 4/13	Wednesday 4/14 (Scott & Dominic)	Thursday 4/15	Friday 4/15 (Jonah & Richard)
1500 → (A)		1500 → (C) * (Jonah & Dominic)		1700 → (D)
		1700 → (B)		
1700 → (C)		1900 → (A)		1900 → (B)

Table 1. Assigned conditions and team member attendance

Procedure

Participant was greeted. They were then read the introduction script. Consent was confirmed. Recording of the testing session on Zoom began. The first task was communicated to the participant. After first task completion, questions are asked such as: How would you describe your experience, If you could change one thing about this application what would it be, What additional information could have been helpful? The second task was administered. After task completion, questions are asked such as: How would you describe this application, If you could change one thing about this feature what would it be, Would you use this application in the future? Lastly, closing questions were asked such as: Is there anything else you would like to share with me today. Closing remarks and thanks were given. The post study satisfaction questionnaire (Lewis, 1992) was given as a url link for the user to complete after the session ended. Evaluation completed.

Participant General Instructions

Hi _____, thanks for agreeing to participate. My name is Brooke and I will walk you through today's session. As a reminder, I am working to improve the usability of this premortem app.

I'd like to begin by thanking you for making time to do this testing with me. I know how busy everyone is right now with end of the semester craziness. Your feedback is valuable and will help us determine if our app functions as intended. Just to confirm, we'd like keep this session to around an hour. Does that still work for you?

If you need a break or to stop at any time, please let me know. During this session, I will start by asking you a few questions. Afterwards, I will ask you to share your screen and accomplish a few tasks using the website we're evaluating. Does this sound okay to you? Great, and just to reiterate, your participation in this testing is completely voluntary and you are able to end testing at any time and for any reason.

Please be aware that there are no wrong answers. In fact, this is probably the one place today where you don't have to worry about making mistakes!

We are doing this to improve the application, so we need to hear your honest reactions, so do not worry about the responses you will be providing.

If you have any questions as we go along, just ask. I may not be able to answer them right away, since we are interested in how people do when they don't have someone sitting next to them to help. But if you still have any questions when we're done, I'll try to answer them then.

Do you have any questions for me now?

Before we look at the app, I'd like to hear a little bit about you. Have you ever been a part of a premortem either as a facilitator or team member? *If yes, for what?* Do you use any project planning app or software currently? *If yes, what is it?* Finally, how much are you looking forward to being done with the semester?

Okay, we are done with the questions, and we can start looking at things.

I will put the application link that we will be working with inside the zoom chat box.
<https://hci-dev.cs.mtu.edu:8144/simplepremortem/facilitator/index>
<https://hci-dev.cs.mtu.edu:8144/simplepremortem/team/index>

Okay, the first thing I'd like you to do is share your screen. You can do that by clicking "Share Screen" in the bottom of our video chat.

Before you share, make sure to close anything you don't want recorded.

Okay, you will be in the role of a *facilitator/team member* for this first round. Your task is to follow the instructions *and conduct a premortem/the facilitator gives you*. We can now begin with testing.

(Discussion of Plan-step) I will give you a few minutes to review the material I have put in the chat (scenario material).

Usability Metrics

- Quantitative
 - Post-study Satisfaction Questionnaire (PSSQ); (Lewis, 1992)
- Qualitative
 - Prompts/Probes During Testing
 - So what happened there?
 - Was that what you expected to happen? (Why or why not)
 - Did you find what you were looking for?
 - Is there anything else you could do at this point?
 - What additional information could have been helpful?
 - Tell me what you're thinking now?
 - Ask them to provide more detail. ("What do you mean by that? Can you tell me more?")

Results

Facilitator Scenario

All participants in the facilitator first condition and some in the team member first condition struggled as a facilitator. Participants were confused and had no idea where they should start. Feedback on the facilitator's home page (see Figure 1.) was that they were looking for more information about the premortem as the current information tab (when it was clicked) was insufficient. This represents a key design recommendation based on usability testing results: an intuitive home page with clear information about what a premortem is and what the facilitator's role is in the process and what they will be doing. Participants were also confused as to what the text box was for sending responses to the team (they didn't know why that was needed). Participants who were in the team member-first scenario reported less confusion when conducting a premortem as a facilitator. When users were probed to expand on why they felt less confusion as the facilitator, users reported that they remembered the instructions and the way the premortem was conducted when they were a team member. Users acknowledged that even the brief experience with the premortem as a team member helped them as a facilitator. This is a promising discovery as it shows that even a short experience with the application, users are able to learn and conduct a premortem as a facilitator this discovery is also supported by results from the post-study satisfaction survey (see question #5 of PSSQ). The facilitator condition not only confused the participants, but even development team members made errors. For example, a facilitator clicked the next button one too many times and team members were no longer able to consolidate their reasons. This brought to light a key design recommendation which is to create the ability to go back for the facilitator. This can be accomplished by a back button that can be located next to the next step button. Participant feedback from the facilitator condition showed that users were unable to conduct a premortem correctly 6 out of 7 times with the application as it currently is. However, with a few key design changes, this application has the potential to become a powerful tool for many project planning teams.

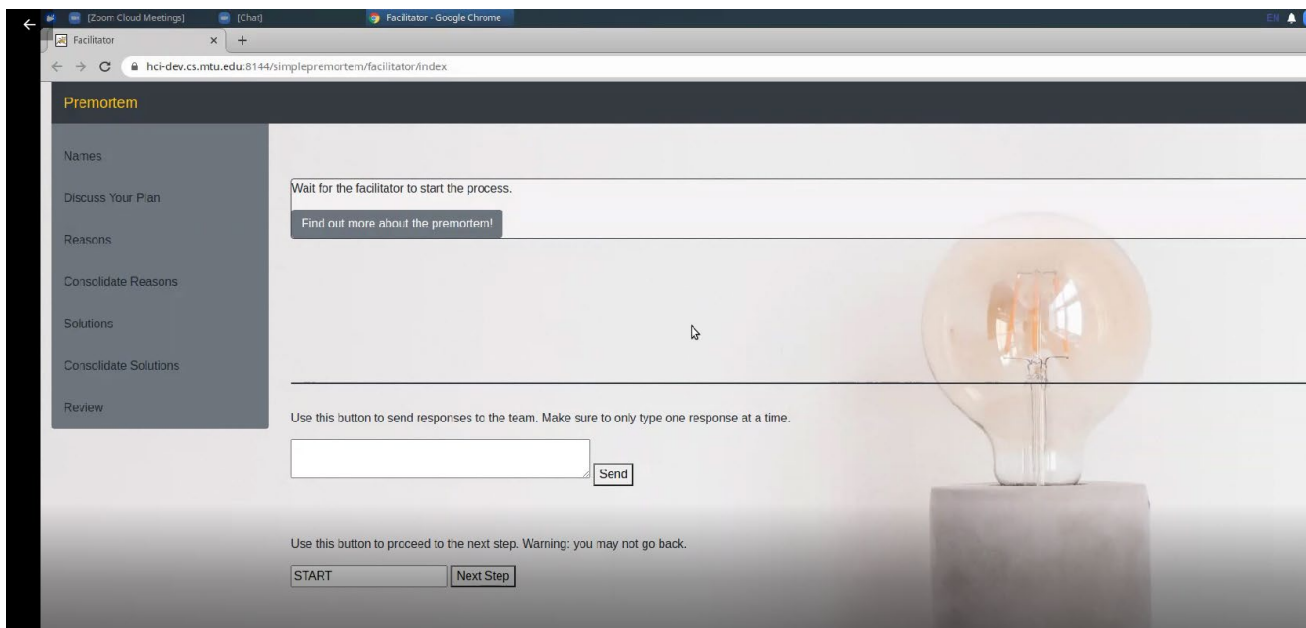


Figure 1. Facilitator's home page

Almost all participants had difficulties with not only the instructions but with the timer as well. The timer functioned exactly how it should, but participants were unable to see the timer while on the correct step (see *Figure 2*). Users needed to scroll to the top of the page in order to see and start the timer. And this is only if they are reading and understanding the facilitator instructions correctly. Users suggested that the timer should be located within the reasons and solutions box so it is both easy to find and to start. *Figure 2* also shows a problem that a few participants encountered, which is that the next step button is located at the very bottom of the screen and the user needs to scroll down to reach it. Currently, there is no buffer between the bottom of the page and the next step button, so it is hard to find, and in one user's case, it was completely covered by their desktop bar and they were unable to even see or reach it without minimizing their screen during the entire scenario.

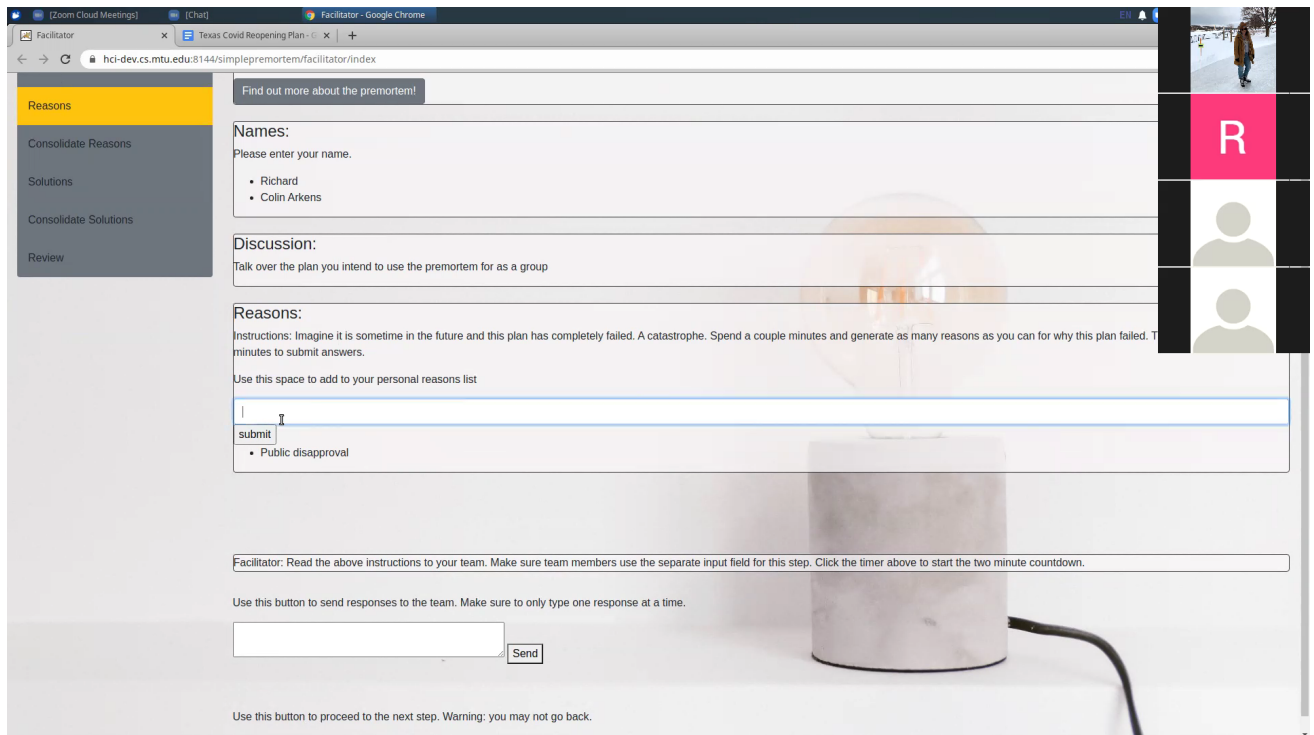


Figure 2. User's struggle with timer and location of next step button

The biggest problem that both facilitator-first and team member-first conditions struggled with the most was the instructions (see *Figure 3*). Based on testing, the instructions need an almost complete overhaul. It was discovered that participants were not reading them correctly, briefly scanning them, reading the wrong instructions, or not reading them at all. When probed, most participants stated that they didn't even see the facilitator instructions as they were not very noticeable and were located far below the actual box the step was located in. This is an area for key design changes, suggestions included:

- Chunking the information into smaller, more manageable sections
- Placing the Facilitator instructions above the team member instructions so they are more easily seen
- Making use of numbered lists and bullets
- Stating the instructions in the smallest amount of words as possible

Participants also suggested having the facilitator steps as separate pages instead of everything on the same page as a simple way to reduce confusion as a facilitator.

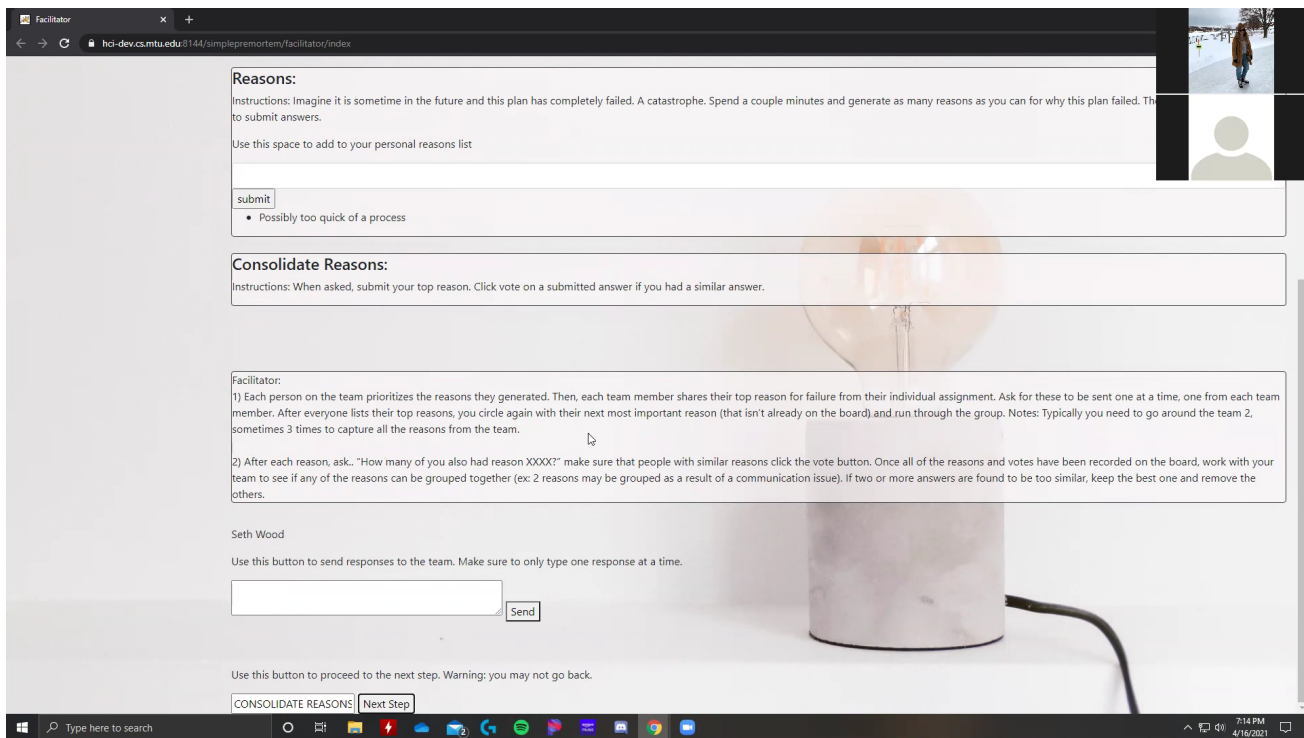


Figure 3. Users struggle with facilitator instructions

Team Member Scenario

Users who were in the facilitator-first scenario reported feeling less confused while they were in the team member scenario. When probed for further details, participants stated that they were unsure as to what they were doing as a facilitator and now seeing someone else conduct a premortem, it made much more sense to them. Participants in the team member scenario were significantly less confused regardless of condition. Factors for this finding include, not needing to be “in control” of the session as a team member, participants only needed to listen to what the facilitator was telling them to do. Team member participants stated that it was annoying that the text in the submission box did not clear after each submission. There was further confusion for some participants as they did not know that they were to submit each reason and solution separately instead of one big submission. Participants also stated that they felt confused as to what the “plan discussion” and “revise plan” step was, this was also found during the facilitator scenarios as well with both the development team and participants not having a clear understanding of those particular steps.

Data Analysis

Multiple Chi-square analyses were performed in R to ensure counterbalancing was effective and that condition had no impact on satisfaction results.

- data: data\$Condition and data\$`1. Overall, I am satisfied with how easy it is to use this app.`
 - X-squared = 1.8958, df = 2, p-value = 0.3875
- data: data\$Condition and data\$`5. It was easy to learn to use this app.`
 - X-squared = 0.875, df = 2, p-value = 0.6456
- data: data\$Condition and data\$`16. Overall, I am satisfied with this app.`
 - X-squared = 1.5556, df = 2, p-value = 0.4594

Satisfaction Questionnaire (Lewis, 1992)

On a scale between Strongly Disagree (1) to Strongly Agree (7), please rate the following statements regarding the Premortem Application:

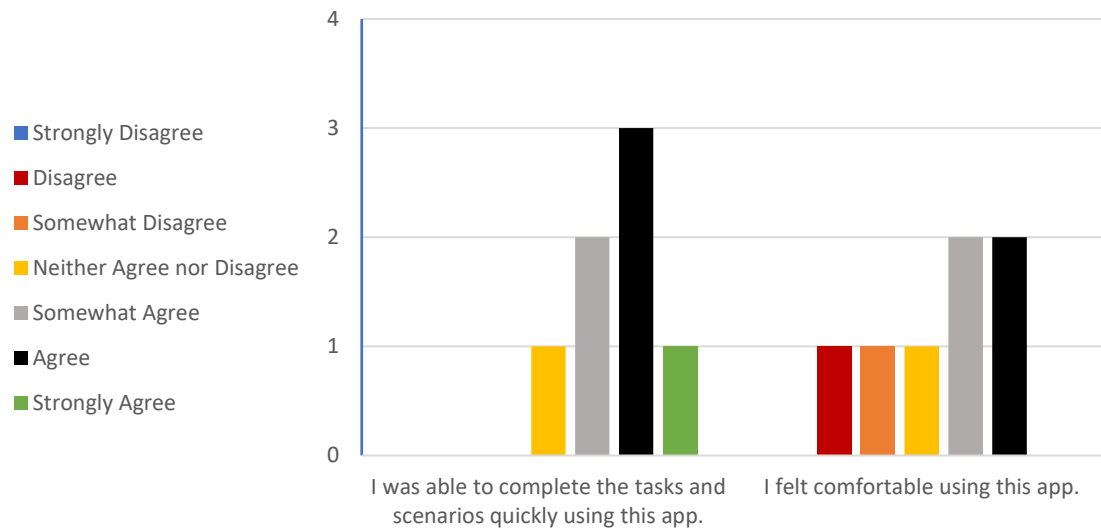
1. Overall, I am satisfied with how easy it is to use this application. (Average score=5.14)
2. It was simple to use this application. (Average score=5.86)

3. I was able to complete the tasks quickly using this application. (Average score=5.57)
4. I felt comfortable using this application. (Average score=4.43)
5. It was easy to learn to use this application. (Average score=5.71)
6. I believe I could become productive quickly using this application. (Average score=6)
7. The application gave error messages that clearly told me how to fix problems. (Average score=3.29)
8. Whenever I made a mistake using the application, I could recover easily and quickly. (Average score=3.71)
9. The information (such as online help, on-screen messages, and other documentation) provided with this application was clear. (Average score=4.57)
10. It was easy to find the information I needed. (Average score=4.29)
11. The information was effective in helping me complete the tasks. (Average score=5.29)
12. The organization of information on the application screens was clear. (Average score=4.29)
13. The interface of this application was pleasant. (Average score=5.29)
14. I liked using the interface of this application. (Average score=5.14)
15. This application has all the functions and capabilities I expect it to have. (Average score=5.14)
16. Overall, I am satisfied with this application. (Average score=5.29)

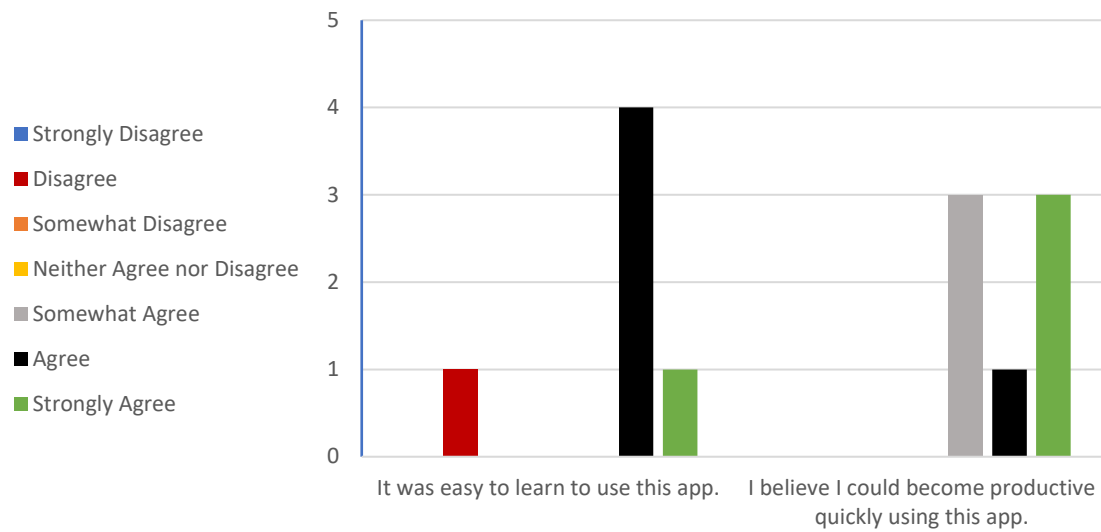
Satisfaction Results



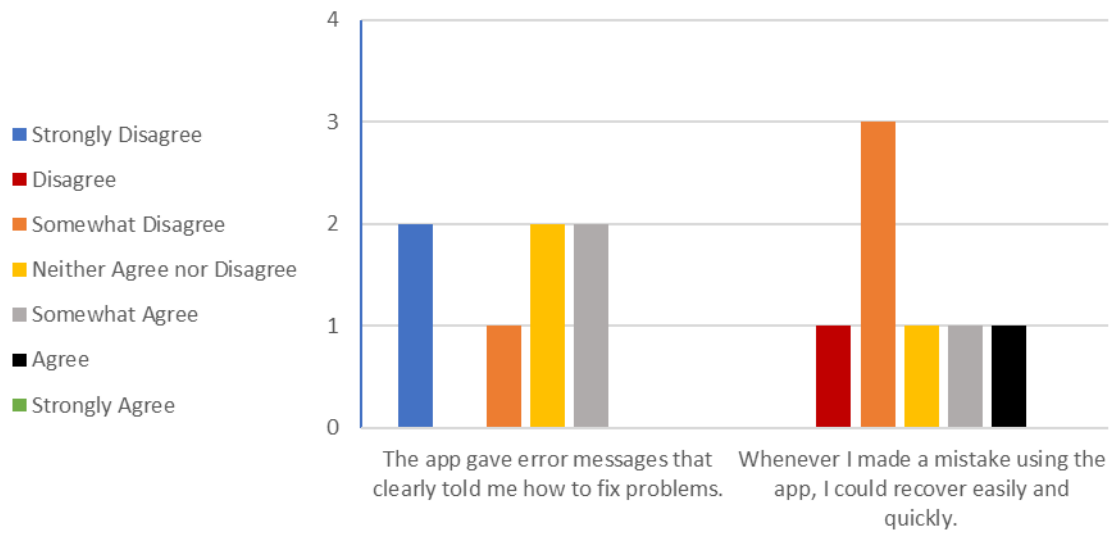
Satisfaction Questionnaire Results Questions 3&4



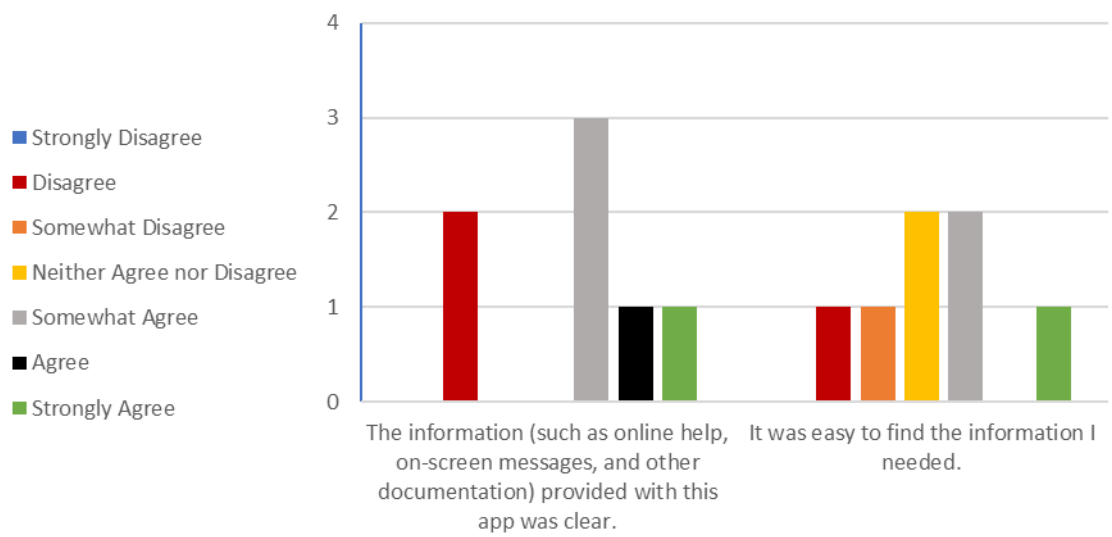
Satisfaction Questionnaire Results Questions 5&6



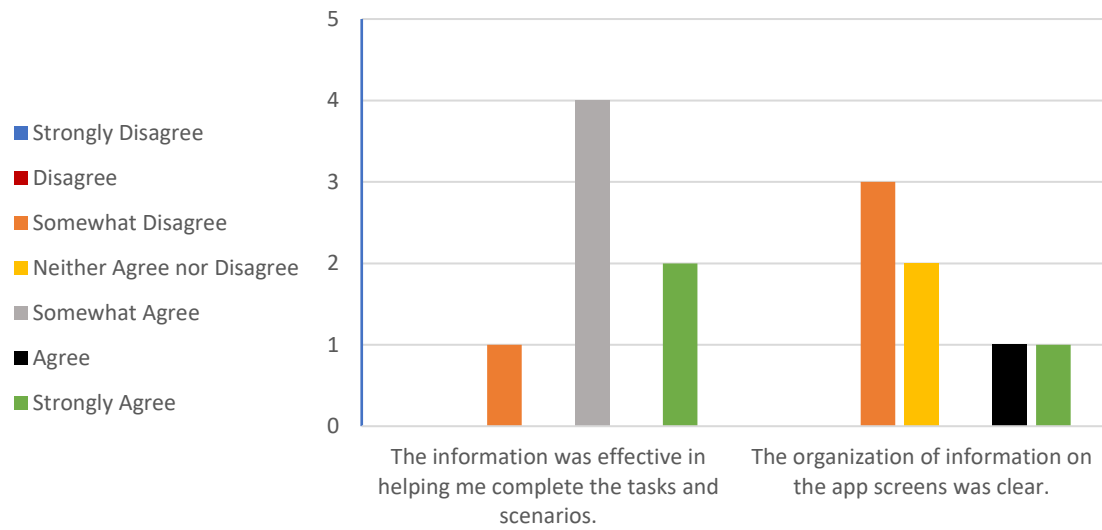
Satisfaction Questionnaire Results Questions 7&8



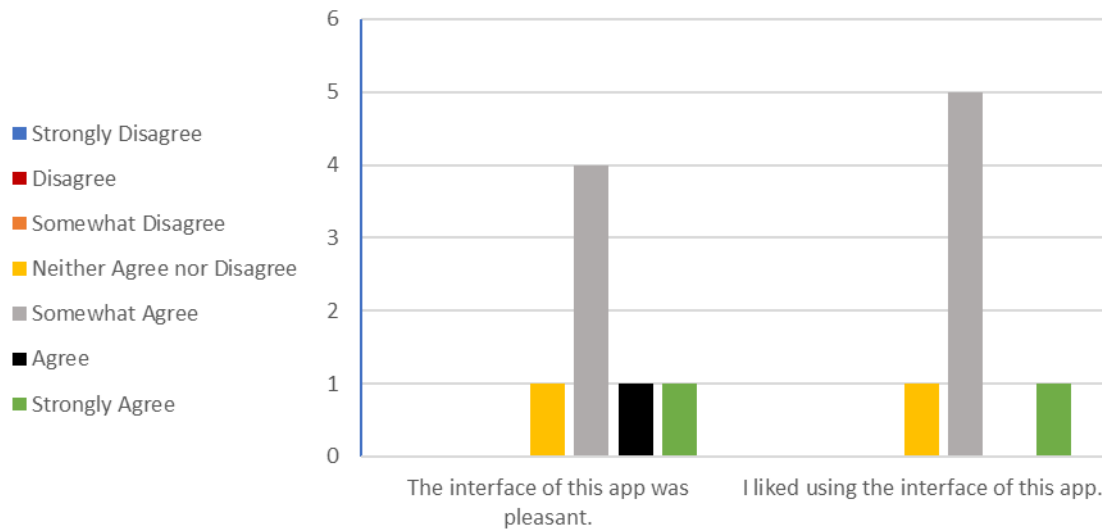
Satisfaction Questionnaire Results Questions 9&10

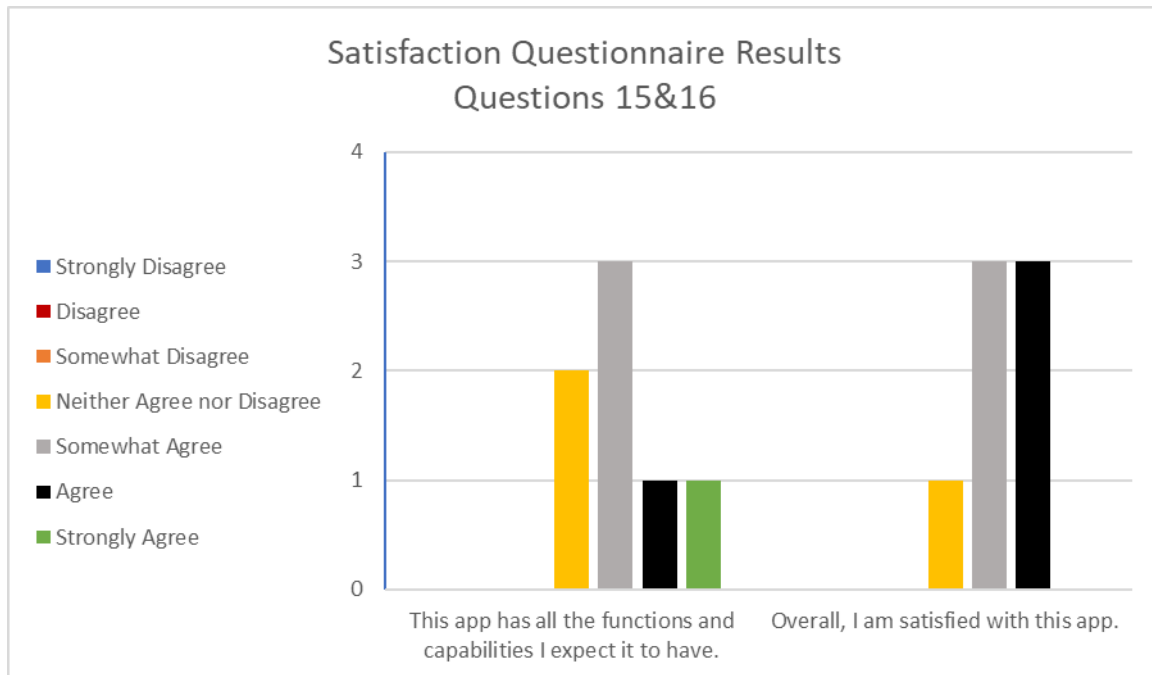


Satisfaction Questionnaire Results Questions 11&12



Satisfaction Questionnaire Results Questions 13&14





Conclusion

Final Design Recommendations

Through usability testing there were many areas for improvement found. The following are recommendations that will have the biggest impact on the user experience of the premortem web application.

- Layout of homepage
 - Needs more information for the facilitator as to what they can expect
 - Should include better information as to what a premortem is and explains the process
- Include a “back” button for the facilitator
- Make the submission boxes more intuitive for users
 - Have submission boxes clear text after each submission
 - Include instructions for team member to submit only one response at a time
- Timer should be relocated to better align with the steps in which it is required
- Better layout of next step buttons
 - Suggestions included using pop-ups to aid in recognition
 - Include a bigger buffer at the bottom of the page between the bottom of the page and the next step buttons
- Instruction Overhaul
 - One user remarked that they should be designed as if the user is “dumb”
 - Instructions need to be intuitive enough and act as “hand-holding” for users, especially if they have had no prior experience with the premortem
 - Place facilitator instructions above team member instruction box; or not include team member instructions on the facilitator side of the application
 - This would allow users who are facilitating a better opportunity to see and follow the instruction correctly

Although there was much confusion with premortem application throughout usability testing, there was also positive feedback as well. As seen in the satisfaction survey, most participants were overall mostly satisfied with their experience using the application. All participants reported that they agreed that they could become productive using this application. Participants also stated that they liked the concept of the premortem after it was explained to them what the intended use of the tool is. If these design recommendations are implemented, this application will become a powerful tool for users.

Appendices

Appendix A.

Consent Form

You are being invited to participate in a research study to determine the usefulness and usability of computer user interfaces. This study is being conducted by Dr. Robert Pastel of Michigan Technological University Computer Science Department and Dr. Pastel's Human-Computer

Interaction (HCI) courses. The students are performing the usability tests as part of their project and to fulfill the HCI course requirements.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in the study. The information you and the tasks that you will perform will determine the usefulness and usability of user interfaces. The questionnaires and the tasks should take less than an hour to complete. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits.

The questionnaires and tests are anonymous. No one will be able to identify you and your answers, and no one will know whether or not you participated in the study except for the instructor of the class who is giving you credit for participating. Should the data be published, no individual information will be disclosed.

Your participation in this study is voluntary. By completing the questionnaires and performing the tasks, you are voluntarily agreeing to participate. You are free to decline to answer any particular question you do not wish to answer or not to perform a task for any reason.

The testing may make use of video conferencing software which will record your tasks on computers screen and from your webcam. The webcam recordings will not be shared, and you may mute the webcam at any time. Before sharing your screen, you should clear your desktop of any open apps except your browser. Also you should clear your desktop of any icons or widget that you wish not to be observed.

Appendix B.

Bug Report

There were no bugs reported during usability testing, the server did go down during the end of our first testing session. However, I did not believe that was due to a bug in our application but rather too many applications were running on the server at the same time.

Appendix C.

Testing Structure

1. Briefing
 - a. Purpose of test
 - b. Procedure
 - c. Their role (e.g., we are not testing you)
 - d. Approximate length
 - e. Their rights (privacy, data handling, stopping)
2. Pre-task Interview
 - a. Participant experience, familiarity with the pre-mortem (if any)
3. Task Moderation
 - a. Participant performs task
 - b. Moderator listens, takes notes, probes where necessary, and may provide assistance when needed
4. Debrief after each task (Not sure if I should do... may bias subsequent tasks?)
5. Final Debrief