U S A B I L I T Y R E P O R T

DATE: April 30, 2021

TO: Dr. Hundhausen, CptS 443/543 Instructor

FROM: Rusu Wu, Jianqiao Liu, Wen-Chih Li, Parikshit Panwar, Yi Yao, Jinyang Ruan, HCI Consultants

RE: Working Assistance Platform Usability Test

HIGHLIGHTS VIDEO URL: https://youtu.be/AaHzMwpVVg0

SUMMARY

Purpose and Scope

On April 19th through 21st, we conducted a usability study of the Working Assistance Platform, which enables one to clock in/out, check monthly attendance report, add events, ask for leave and business trip, communicate with colleagues and company groups.

In this study, five participants were asked to perform five core tasks of the Working Assistance Platform high-fidelity prototype:

- Clock in/out.
- Check monthly attendance report.
- Add events.
- Ask for leave and business trip.
- Chat with employees and company groups, create and join company groups, search, and add new employees.

Participants, prior to exploring the high-fidelity prototype, were asked to fill a background questionnaire which asks them about their background and experience in using software's like the Working Assistance Platform. After the participant was successful in performing all the core tasks, they were given an exit questionnaire containing queries about their experience in using the high-fidelity prototype.

Methods

We recruited 5 participants for this preliminary usability study. One of the participants was an employee of a company, and the rest of the participants were students (one high school and three graduate students).

We ran the study through Zoom. Because of the COVID-19 pandemic, it will be easy for us to use Zoom for recording and inviting our participants to do our usability study.

We allotted 30 to 40 minutes for each study session. At the beginning of the test, participants filled out an on-line background questionnaire. See Appendix A for a copy of the questions and their responses. Next, they completed a warm-up exercise, in which they were given a brief description of the “Working Assistance Platform” software, and then asked to think aloud while they explored the "Working Assistance Platform” interface for 5 to 10 minutes.

After the warm-up exercise, participants were asked to use “Working Assistance Platform” to complete a series of five tasks. See Appendix C for a copy of the original task sheet that participants received for the test. As they worked through these tasks, participants were instructed to think aloud by verbalizing their thoughts and actions. If they became silent, or if it was unclear what they were up to, they were prompted to explain what they were doing.

Upon completion of the tasks, participants filled out an exit questionnaire that solicited their impressions of “Working Assistance Platform” Software. Appendix C includes the exit questionnaire and participants’ responses.

FINDINGS

Overview

The key findings of our usability study were that most of the problems that participants faced was related to signifiers. For example, in task 2, for checking the attendance report, participants were unable to immediately identify the report icon on the screen. Similarly, most participants did not realize the “+” button which is used to add an event and adding new contacts in tasks 3 and 5 respectively; therefore, caused more time for participants to complete the task. Also, in task 3 for adding an event, participants would click on the row for inviting a participant rather than clicking the checkbox. In task 4, participants were able to submit the leave request without filling in all the required fields. As there was no feedback given to participants for not providing information in the required fields, participants failed to notice their fault.

However, some participants have also provided positive feedback regarding the simplicity of the interface and the usefulness of our software.

Overall, the working platform system design can be considered a success. The software received the following ratings (out of 10; See Appendix D for full details)

- Average rate of ease of use: 7.80/10.00
- Average rate of learnability: 8.00/10.00
- Average rate of usefulness: 8.60/10.00

Table 1. Summary of key results vis-à-vis the usability and user experience goals we established for our software.

Usability or U.E. Goal	Relevant Empirical Result	Commentary
Users must be able to clock-in in 2 seconds.	Average time for participants to complete the task: 2 seconds.	For this usability goal, the result show that the actual time meet our goal. This indicates this task is design properly.
Users must be able to check the attendance report in 10 seconds.	Average time for participants to complete tasks: 25 seconds.	For this usability goal, the results show that the actual time is more than the usability goal. It indicates that the function has some issue need to be fixed.
Users must be able to add a new event task in 30 seconds.	Average time for participants to complete the task: 62 seconds.	For this usability goal, the results show that the actual time does not meet our goal. It can show that most of our participants are having trouble doing this task. It should have some design change on this task.
Users must be able to request for a leave in 30 seconds.	Average time for participants to complete the task: 42 seconds.	For this usability goal, the results show that the actual time exceeds our user goal. It can tell that the user might have little trouble when doing this task, cause the timing is not over too much compared with the user goal.
Users must be able to request for a business trip in 45 seconds.	Average time for participants to complete the task: 42.3 seconds.	For this usability goal, the results show that the actual time is less than the user goal. One of the possible reasons could be the user have done the same task “ask for a leave” before, the process of the task is relatively the same.
Users must be able to open the chat page and send a message in 10 seconds.	Average time for participants to complete the task: 8.95 seconds.	For this usability goal, the results show that the actual time is less than the user goal which means that the design is simple for all participants.
Users must be able to create a company group in 30 seconds.	Average time for participants to complete the task: 52.3 seconds.	For this usability goal, the result shows that the actual time exceeds our user goal. Which means that the function is designed questionable. We need to have some design change on it.
Users must be able to search and add a contact in 20 seconds.	Average time for participants to complete the task: 41.2 seconds.	For this usability goal, the result shows that the actual time exceeds more than 20 seconds with our user goal. It implies that the function makes the user feel confused. They need more time to complete this task.
On a scale of 1 to 10, users must rate the app an 8 in terms of ease of use of Working Assistance Platform.	Average rate: 7.80/10	For the ease of use, the minimum rating criteria is not met. This implies that most of the participants felt it difficult to navigate through the tasks.
On a scale of 1 to 10, users must rate the app an 8 in terms of learnability of Working Assistance Platform.	Average rate: 8.00/10	For the learnability, majority of the participants feel that the software is easy to learn for a novice user.
On a scale of 1 to 10, users must rate the app an 8 in terms of usefulness of Working Assistance Platform.	Average rate: 8.60/10	For the usefulness, since the average rating exceeds the minimum criteria, therefore, majority of the participants feel that the software is useful to have.

We begin each subsection below with a brief description of the user subtask to which the problems listed in the subsection pertain. Next, in order of decreasing severity, we describe the associated usability problems, and provide "Severity" and "Scope" ratings based on the empirical evidence. Following the problems, we cite evidence of each problem based on our analysis of the usability study. Each subsection concludes with specific design recommendations that we believe will remedy the problems.

1. Clock in/out.

In this task, participants are asked to clock in and clock out with the application. To successfully complete the task, participants should tap "Clock in" button to clock in for work, and tap "Clock out" button to clock out for work. In our high-fidelity prototype, we assume participants are already within the attendance rage (for instance, their office), so there is no hindrance to do this task. However, in the real software implementation, only when the users enter the work attendance rage, they can clock in/out.

Problems:

None, all five participants work fine, there is no problem with this task.

Evidence:

All the participants perform well on this task. Participant 3 has mentioned that the task is quite easy.

Diagnosis:

This task only has to do with one button so that it is not difficult to finished. Also, the button is on the middle of the screen, it is in the obvious spot. This good design has a good signifier, refers to one of the Norman's principle.

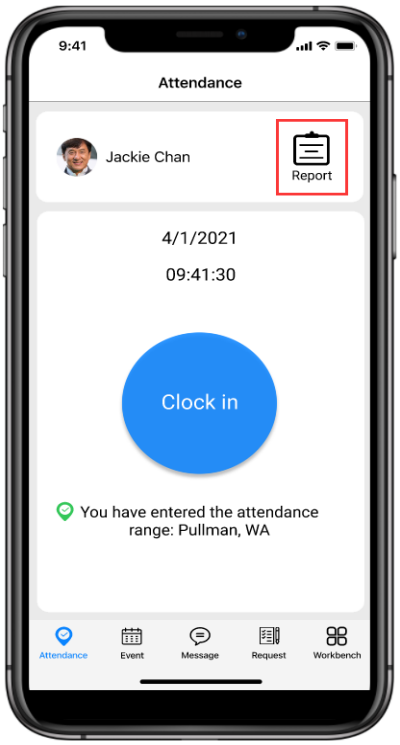
Recommendations:

None.

2. Check monthly attendance report.

In this task, participants are told to check "attendance report" on the "attendance" screen and check the "clock in calendar" on the "monthly attendance report" screen. To successfully complete the task, participants should click the "Report" button on the "attendance" screen to go to the "monthly attendance report" screen, and then click the "Clock in calendar" button to go to "Clock in calendar" screen.

Problems:



1. Users may have trouble noticing that the “Report” button is for them to check their “monthly attendance report”. (Severity = 1, Scope = 2)

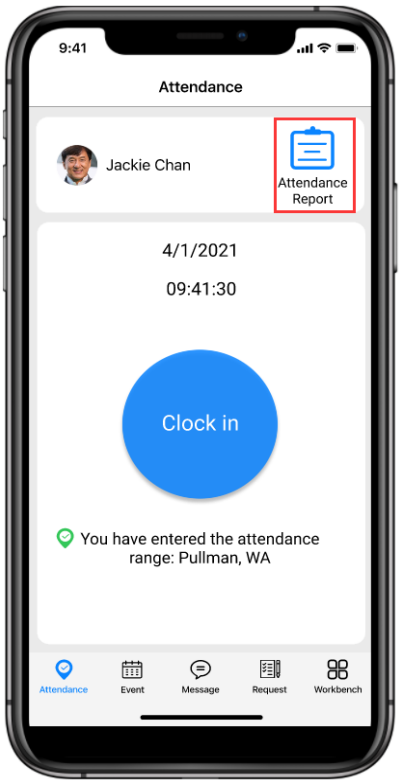
Evidence:

Two of five participants exhibited this problem. Participant 2 finally figured out the meaning of the “Report” button by giving her some hints. Participant 3 first assumed that the report button might be at the footer, instead of first looking at the top right, so it may take some extra time.

Diagnosis:

In order to find the attendance report, the participants are focusing on finding the word "Attendance" rather than "Report". In addition, the “Report” button is not obvious for users to click. This represents that the *signifier* (Norman’s principle) of the “Report” button is ambiguous and unobvious and should be improved. We need to use more obvious icon and words to make the user notice the button and understand the meaning of the button.

Recommendations:

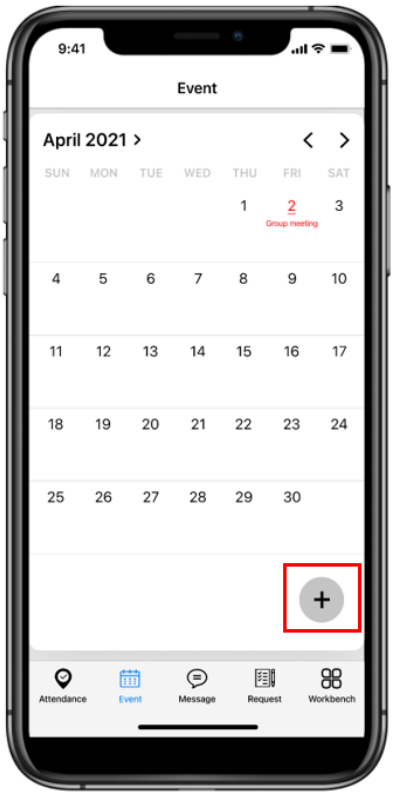


1. As shown in picture, redesign the report button, use the word "Attendance Report" to replace the word "Report", this change will make the user feel comfortable when doing this task. Additionally, add the report icon or image on the left part of the button, it will also help the user to recognize the button.

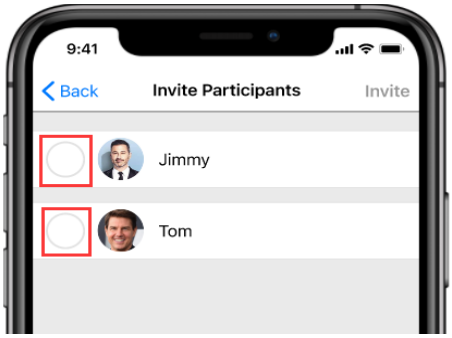
3. Add new event.

In the task, participants are told to add an event with specific information (see Appendix C: Task 3 for detailed information). To successfully complete the task, participants should click “Event” button in the navigation bar to go to the “Event” screen, click the “+” icon to go to “Add Event” screen. On the “Add Event” screen, participants should click the input box to simulate typing in the event title “Reporting”, click the date and time to set starting time and ending time, click “Invite participants” button to select and invite Jimmy and Tom, click “Location” button to select the location as “Manager office”, and then click “Add” button to submit the event and finish the task.

Problems:



1. Users may have trouble noticing and realizing the “+” button is used for adding a new event. They will try to click on the date on the calendar to add an event. (Severity = 1, Scope = 2).



2. Users may take more time on selecting the participants. They would click the row rather than the checkbox. (Severity = 3, Scope = 3)

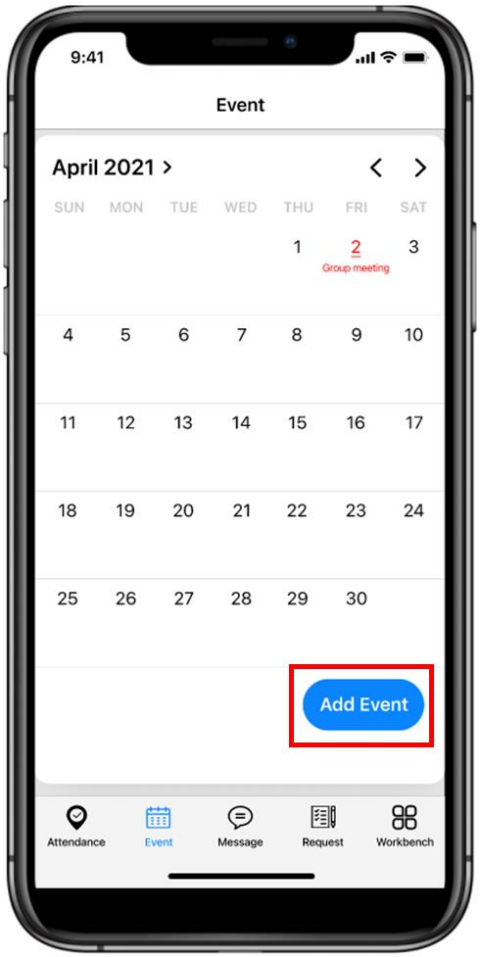
Evidence:

1. For problem 1, three of five participants exhibited this problem. Participant 3 did not notice the "+" button, which is required to add an event. Participant 4 needed our instructions to finish this task rather than intuitively do it on her own. Participant 5 confused about the step of the task, and he did know how to add an event since there is no such a signifier.
2. For problem 2, one of five participants encountered this problem. Participant 3 clicked the row to select the participants, but it did not work, so he spent more time finding that clicking the checkbox was the correct operation.

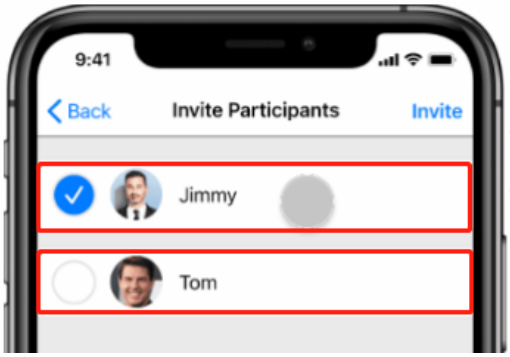
Diagnosis:

1. For problem 1, the participants did not consider that the “+” icon is a button to add a new event. It might because the *signifier* (Norman’s principle) of the add event button is unobvious. In addition, there is no instruction next to the button. Designers should *place instructions in context in which they are needed* (human memory). Thus, users would be harder to find the button without any instructions.
2. For problem 2, according to *Fitts’ Law*, *the larger the target, and the closer the pointer is to it, the faster a person can move the pointer to the target*. Since the targets to select the participants are just the small checkboxes, users will spend more time to move the pointer to the checkbox.

Recommendations:



1. For problem 1, redesign the "+" icon into a button named "add event", and use light blue background color to make it more obvious. This design change will allow the user to clearly see it when they want to add a new event.



2. For problem 2, increase the area which can be used to select the item, so users only need to click the row to select the item, and it will save some time.

4. Ask for leave and business trip.

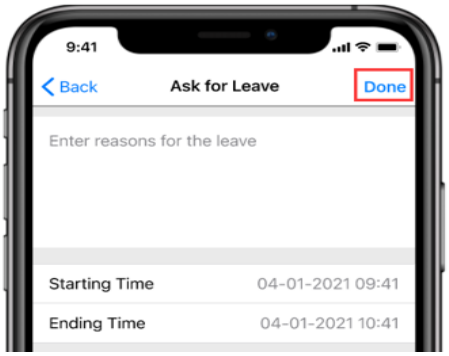
In this task, participants are asked to go to the “Request” screen to request a leave and a business trip with specific information (see Appendix C: Task 4 for detailed information), and view “My requests”. There are three subtasks of this task.

For the first subtask, to successfully complete the task, participants should first click the “Leave” button, click the input box to simulate typing in the reason, set the starting time and ending time. After finished all information, participants should click the “Done” button to submit the request, the system will pop out “Successful” text to tell the user the request being successfully done.

For the second subtask, to successfully complete the task, participants should first click the “Business trip” button, click the input box to simulate typing in the reason, set a destination as “Seattle”, set the starting time and ending time. After finished all information, participants should click the “Done” button to submit the request, the system will pop out “Successful” text to tell the user the request being successfully done.

For the third subtask, to successfully complete the task, participants should click the “My requests” button on the “Request” screen to go to the “My requests” page to view all the requests.

Problems:



1. Users may click “Done” button to submit the request without finishing all required information. (Severity = 2, Scope = 2)

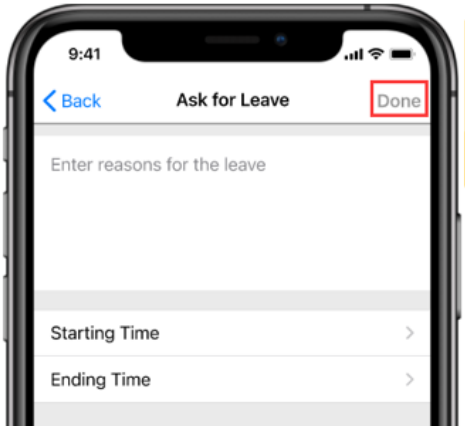
Evidence:

Two of five participants exhibited this problem. Participant 2 forgot to set the ending time and she goes straight to click done. Participant 5 tried to ask for a leave set with a starting time and an ending time, but he just finished setting the starting time and then click done.

Diagnosis:

Designers should *add constraints to prevent errors* (Human error design implications). However, there is no constraint when users have not completed all the required information, so users will not notice that they need to complete the task comprehensively which will cause errors. Moreover, the preset starting time and ending time will give the users the illusion that the time settings have already been completed. In addition, the system did not provide feedback when the user has not finished setting the time and goes straight to click "done". It did not match the principle from Norman's concept of "*Feedback*".

Recommendations:



1. Let the "Done" button cannot be click until all setting are finished, it will extremally avoid the situation of submitting the request without completing everything.
2. Do not preset the starting time and ending time, it will let users know that the time has not been set.

5. Chat with friend or with group. Create and join in company groups, add friends.

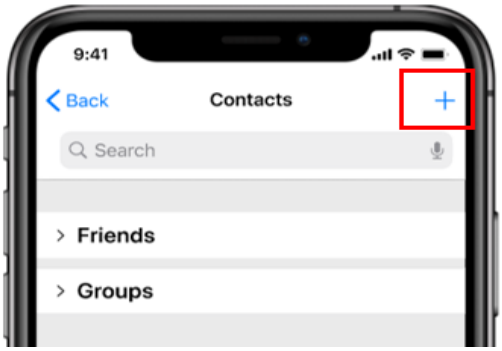
In this task, participants are asked to chat with a friend and a company group, create a company group and join a company group, search and add a new friend. We divided this task into three subtasks.

For the first subtask, to successfully complete the task, participants should first click the "Message" button in the navigation bar to go to the "Message" screen. Click the message row of "Jimmy" to chat with Jimmy, click the input box to simulate typing in and sending the message. Then, go back to "Message" screen and click the message row of "Human-Computer Interaction" and do the same action.

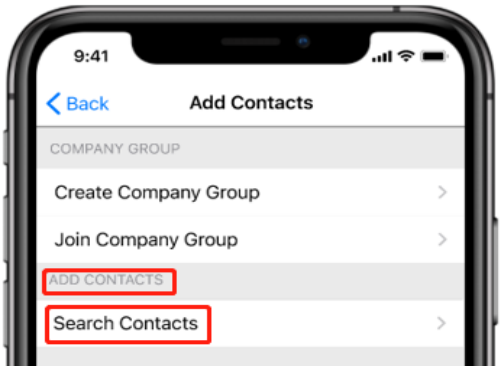
For the second subtask, to successfully complete the task, participants should click the “Contacts” button on the “Message” screen to go to the “Contacts” screen. Click the “+” button in the upper left corner to go to the “Add Contacts” screen. Then, click the “Create Company Group” to go to “Create Company Group” screen, click the input box to simulate typing in the company name, select the size and location, and submit to complete the task.

For the third subtask, to successfully complete the task, participants should click “Join Company Group” to go to the search company group screen, click the input box to simulate typing in the company name, and click “Join” button to join the group. After that, participants should click “Search Contacts” button to go to the search contacts screen, click the input box to simulate typing in friend’s name, and click “Add” button to add the friend.

Problems:



1. Users may not notice the “+” button to click to add new contacts. (Severity = 2, Scope = 2)



2. Users may be confused about how to search and add an individual contact. (Severity = 2, Scope = 3)

Evidence:

1. For problem 1, two of five participants encountered this problem. Participant 2 did not notice the “+” icon on the top right in the contact page, so it takes some time for her to figure out how to get to “Add Contacts” page to create a company group. Participant 4 did not notice the“+” icon either, he clicked "group" button rather than clicking "+" button at first time.
2. For problem 2, one of five participants encountered this problem. Participant 5 was confused about how to search and add a contact and he did not know which button is for add a new contact. He tried to search with the input box on

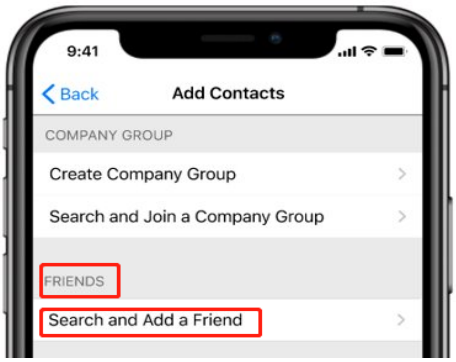
"Contacts" page, but failed, since we did not design the function of it on that page.

Diagnosis:

1. For problem 1, some of the participants did not notice the "+" button at first, it might because the *signifier* (Norman's principle) of this button is unobvious. In addition, there is no instruction next to the button. Designers should *place instructions in context in which they are needed* (human memory). Thus, users would be harder to find the button without any instructions.
2. For problem 2, since *human perception is biased*, so designers should "*avoid ambiguity*" (Johnson's text). The textual labels of the row are not clear enough for users to know which one is for adding a friend. When participants want to add a friend, they would seek for the word "friend" but they cannot find it, so the problem will occur.

Recommendations:

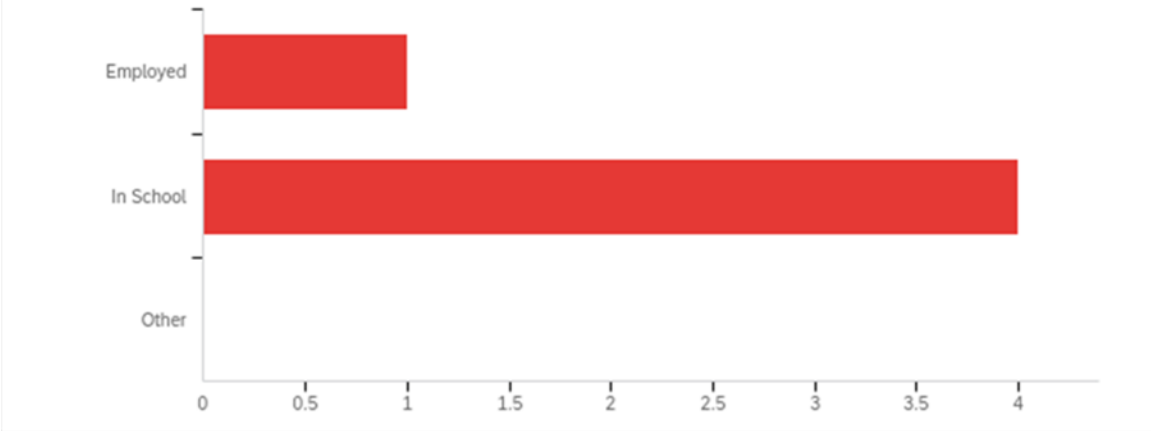
1. Replace the small "+" button with a bigger button with an icon and textual label "Add New Contacts", it will make users see it more clearly.



2. Replace the class name "Add Contacts" with "Friends" and replace the button name from "Search Contacts" to "Search and Add a Friend", it gives a keyword "Friend" and will reduce the ambiguity of this button.

APPENDIX A: BACKGROUND QUESTIONNAIRE RESPONSES

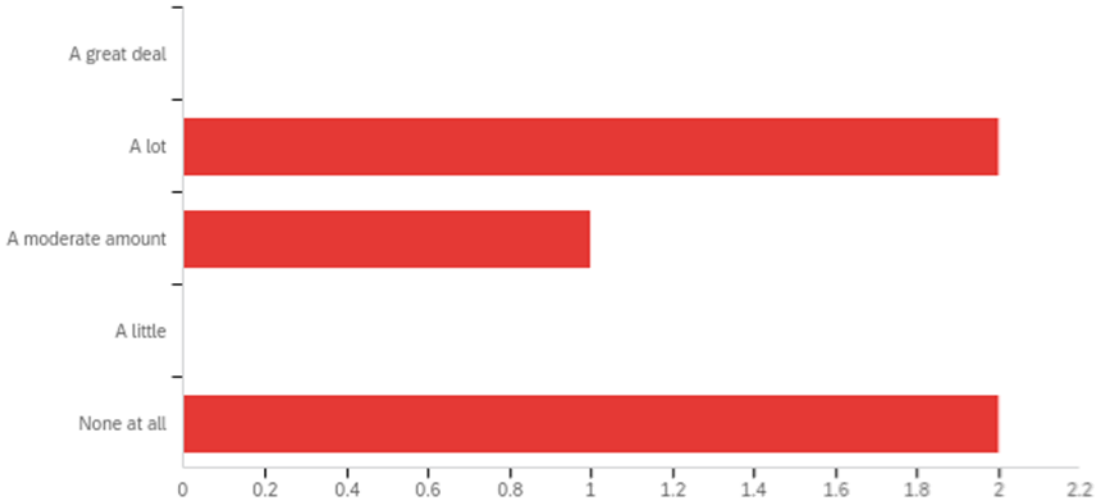
Q1 - What is your employment status?



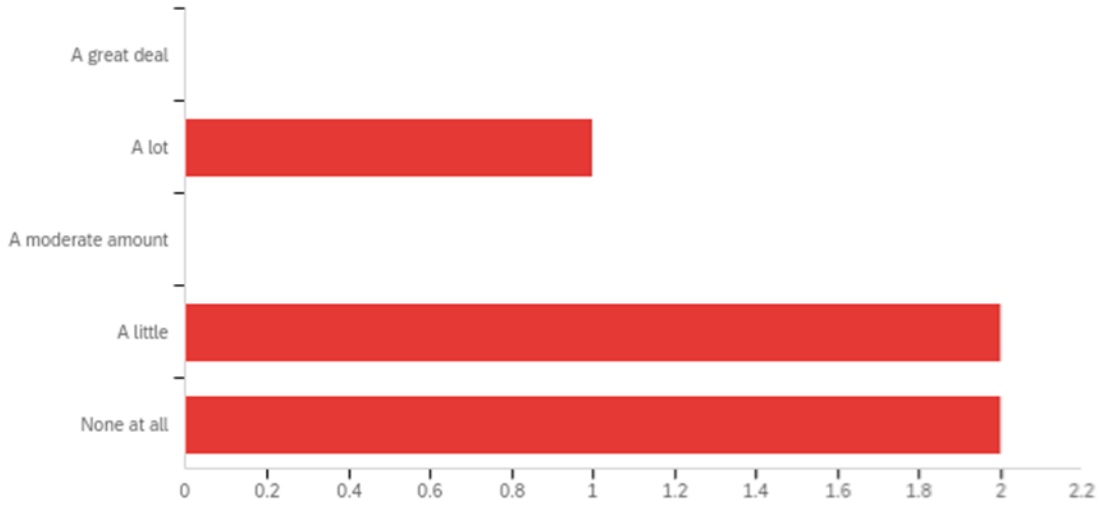
Q2 - If employed, what do you do? If in school, what year are you and what is your major?

Graduate student CS
Junior in High School
English teacher
1st year of Grad studies in Electrical Engineering
Graduate student

Q3 - How much experience do you have with using office applications?



Q4 - How much experience do you have with testing applications or user interfaces with users?



Q5 - What are the office applications that you have been used before?

zoom， word
Word, Excel, Zoom, Microsoft Team
None
none
Teams, office

APPENDIX B: INFORMED CONSENT FORMS

Informed Consent Agreement to Participate in Usability Study of Working Assistantence Platform

Rusu Wu, Jianqiao Liu, Wen-Chih Li, Parikshit Panwar, Yi Yao, Jinyang Ruan
School of Electrical Engineering and Computer Science
Washington State University

Description of Study: You have been asked to participate in a usability test of new software created as part of the above persons' (henceforth, "the researchers") course project for CptS 443/543 at Washington State University. Your participation in this usability test will help the researchers to better understand the software's strengths and weaknesses. You have been asked to spend about 20 minutes participating in this test. This will involve your doing some or all of the following things:

- Reading aloud and studying brief task descriptions;
- Interacting with a computer;
- Interacting with the researchers and/or other students;
- Thinking aloud (explaining what you're doing and thinking), and

- Filling out questionnaires.

The researchers will record the session on videotape. Although your voice, and possibly your face, will appear on the recording, your name will not be on the recording. The recordings will be viewed only by the instructor and students affiliated with CptS 443/543 at Washington State University in order to fulfill a course requirement. When the researchers describe their work to the class, they will not use your name.

Risks and Benefits Expected: The study will not incur any risks beyond the minimal risks associated with interacting with a computer. The study is not expected to help you directly. The results may help the researchers to improve the design of their software.

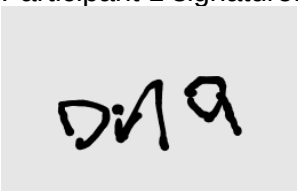
Confidentiality: Any information about you that is obtained from this study, including what you say, will be confidential. Your real name will be kept in a locked file and only the researchers will have access to it. Only your code name will be on the video recording and in reports of the study.

Right to Refuse or End Participation: You may refuse to participate in this study or stop participating at any time.

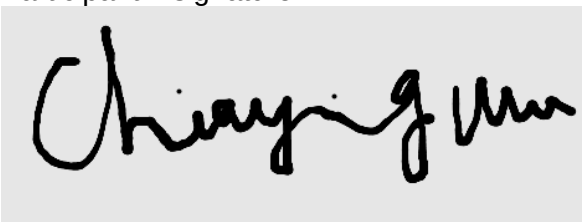
Certification: By signing below, you certify that you have read and that you understand the foregoing, that you have been given satisfactory answers to your inquiries concerning projects procedures and other matters, and that you have been advised that you are free to withdraw your consent and to discontinue participation in the usability test at any time.

You herewith give your consent to participate in this test with the understanding that such consent does not waive any of your legal rights, nor does it release the researchers or any agent thereof from liability for negligence. You understand that you shall remain anonymous in all written and verbal reports of this test. You may make a copy of this form to keep.

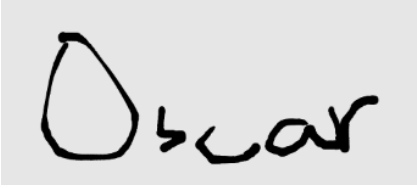
Participant 1 signature:

 Date: 4/19

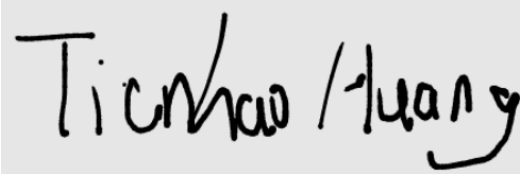
Participant 2 signature:

 Date: 4/20

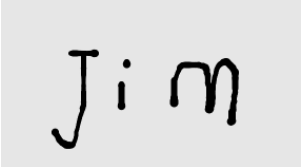
Participant 3 signature:

 Date: 4/20

Participant 4 signature:

 Date: 4/20

Participant 5 signature:

 Date: 4/21

APPENDIX C: USABILITY TEST TASKS

Task 1

In Working Assistance Platform, you are able to clock in and click out based on the time and location.

1. Clock in and click out on the attendance page.

Task 2

In Working Assistance Platform, users should be able to check their monthly attendance report.

1. Check "attendance report" on the "attendance" page.
2. Check your "clock in calendar" on the "monthly attendance report" page.
3. Go back to "attendance" page.

Task 3

In Working Assistance Platform, user can add the new event to the calendar.

1. Go to "event" page.
2. Add an event with the following information:
    a) Title: Reporting.
    b) Starting time: 04/05/2021 10:00.
    c) Ending time: 04/05/2021 11:30.
    d) Invite participants: Jimmy and Tom.
    e) Set the reporting location: Manager office.
    f) Submit the event.
3. Go back to "event" page.

Hint: Tapping the input box to simulate the input operation. Tapping the time picker to simulate the time changing operation.

Task 4

In Working Assistance Platform, you are able to ask for a leave and request business trip.

1. Go to "request" page.
2. Ask for a leave with the following information:

   a. Reason: Visit dentist.
   b. Starting time: 04/08/2021 09:00.
   c. Ending time: 04/08/2021 12:00.
3. Go back to "request" page.
4. Ask for a business trip with the following information:
   a. Reason: Provide face-to-face guidance to users.
   b. Location: Washington-Seattle.
   c. Starting time: 04/12/2021 09:00.
   d. Ending time: 04/15/2021 17:30.
5. Go back to "request" page.
6. View my requests.
7. Go back to "request" page.

Hint: Tapping the input box to simulate the input operation. Tapping the time picker to simulate the time changing operation.

Task 5

In Working Assistance Platform, you are able to chat with your friends and your teams. Also, able to create and join in company groups, add friends.

1. Go to "message" page.
2. Chat with "Jimmy", send "How are you?" message.
3. Chat in the "Human-Computer Interaction" group, send "How are you?" message.
4. Go to "contacts" page.
5. Create a company group with the following information:
   a. Company name: Washington State University.
   b. Size: >1000.
   c. Location: Washington-Pullman.
   d. Submit
6. Go back to "add contact" page.
7. Search and join the group with name "Washington University".
8. Go back to "add contact" page.
9. Search and add the contact with name "Benedict Cumberbatch".
10. Go back to "message" page.

Hint: Tapping the input box to simulate the input operation.

APPENDIX D: EXIT QUESTIONNAIRE RESPONSES

	Minimum	Maximum	Mean	Std Deviation	Variance	Count
Q1 - On a scale of 1 to 10, with 1 being "very difficult" and 10 being "very easy", how would you rate the ease of use of Working Assistance Platform?	3.00	9.00	7.80	2.40	5.76	5
Q2 - On a scale of 1 to 10, with 1 being "very difficult to learn" and	3.00	10.00	8.00	2.53	6.40	5

10 being "very easy to learn," how would you rate the learnability of Working Assistance Platform?						
Q3 - On a scale of 1 to 10, with 1 being "not useful at all" and 10 being "very useful," how would you rate the usefulness of Working Assistance Platform as a tool for constructing applications prototypes?	7.00	10.00	8.60	1.02	1.04	5

Q4 - Did you find any of the tasks to be confusing? Which ones? How would you change the tasks to make them easier to understand?

Every time I finished creating my event and it keep showing success! If the "success!" can disappear automatically, I think it will become better.
There are some inconsistences in the task of searching and adding group and people.
None
The last task is the most confusing for me. It would be easier if I can search the company name directly instead of pressing the bottom of "adding".
No issue with the tasks but implementing few of them was not doable

Q5 - What did you like about the software you used? Were there any features that you found particularly useful? Why?

I think it is convenient for me to clock out/in, because it shows the place and time.
the interface is easy to understand, and the description of each button is accurate.
The request system is pretty clear to understand, and it would prob be useful in reality.
Yes, it is extremely helpful for its fairness and convenience. Employees could have a transparent record and it could help avoid any controversy.
The readymade answers without me needing to type them

Q6 - What did you not like about the software you used? Were there any features that gave you particular grief? Why?

I think the worse one is about the time when I want to add event. if it can automatically show that day I add event, I think it will become better.

I think it is good enough so far
Not really, it is a convenient app and pretty useful too.
a bit concern about the first step for its trustworthiness. Employees might press the clock in while they are still on their way.
Not Applicable. The software was fine

Q7 - If you were designing this software, how would you change it so that it worked better for you?

I think this one is better enough, and I have no idea about the better one
Maybe I will provide a clearer description of operations
None
Nope
I would add a voice command to take orders like Siri for example

Q8 - Is the software you used something that you could see yourself using again? Why or why not?

Sure, if I can use the software for working. I will use this one again.
Yes, I like the simplicity of the interface, which makes is easy to understand the intent of buttons.
Yeah absolutely! It is an app that could be useful and efficient for myself.
yes. all of the features are really helpful not only for employers, but employees could benefit from it.
I wouldn't use just because it is not complex enough but if advanced yes

APPENDIX E: CRITICAL INDICIDENTS LOG

Participant 1

Time	Task	Description of Incident
12:54	Task1	The task statement did not guide the user how to enter the "home" page from the "welcome" page. That make the user little confused with the task testing.
18:40	Task4	The task asks the user to create a business trip. However, the user gets a wrong interaction information from the system.
22:35	Task5	The task asks the user to send a message. The user feels a little confused with how to send the message.
24:33	Task5	The user cannot find how to join the group. "Join the group" function is placed under a wrong class.

Participant 2

Time	Task	Description of Incident
2:43	Task2	The participant did not understand that she will have to click on report button in order to view the monthly attendance report.
6:57	Task4	The participant did not notice that they need to complete the task comprehensively.
9:03	Task5	The add icon is hard for user to notice, it might be change to another place that will make the user easily recognize.
11:10	Task5	The participant did not notice the "create a company group " is in the top, she goes straight to search it.

Participant 3

Time	Task	Description of Incident
1:49	Task2	The user did not instantly realize that the report button was on the top right.
3:29	Task3	The user did not notice the "+" button, which is required to add an event.
3:54	Task3	The user did not know how to change the start time.
4:23	Task3	The user did not know whether "AM" or "PM" was selected.
4:36	Task3	The user took a little more time to select the participants.

Participant 4

Time	Task	Description of Incident
7:41	Task3	It cost 3-4 seconds for user to find "+" icon which is designed to start adding an event.
8:34	Task3	The participant did not notice he should invite 2 participants at the first time.
11:59	Task5	The participant clicked "group" button rather than clicking "+" button at first time.

Participant 5

Time	Task	Description of Incident
8:39	Task3	The instruction asked participant to add an event starting with add a title. Participant did not know where to add an event.
10:34	Task3	The participant failed to select participants if they click on the profile photos.
11:08	Task3	After the participant added an even and submitted it, there will be a "successful page". The participant waited for seconds hoping it will be closed automatically.
12:20	Task4	The participant did not finish the task and click donate

		participant tried to ask for leave setting with a starting time and an End time, but he just finished setting starting time and then click done.
16:48	Task5	In the contact page, there is a search input bar, the participant tried to search a with the bar, but failed. Also, the participant confused about whether to click create/ join group or search contact because there is no such a button called "add a contact."

APPENDIX F: SUMMARY OF USABILITY PROBLEMS

Problem Description	**Evidence***	**Severity**	**Scope**	**Diagnosis**	**Design Recommendation**
In task 2: Users may have trouble noticing that the "Report" button is for them to check their "monthly attendance report". Time P2 2:43 P3 1.49	Two of five participants exhibited this problem. Participant 2 finally figured out the meaning of the "Report" button by giving her some hints. Participant 3 first assumed that the report button might be at the footer, instead of first looking at the top right, so it may take some extra time.	1	2	In order to find the attendance report, the participants are focusing on finding the word "Attendance" rather than "Report". In addition, the "Report" button is not obvious for users to click. This represents that the signifier (Norman's principle) of the "Report" button is ambiguous and unobvious and should be improved. We need to use more obvious icon and words to make the user notice the button and understand the meaning of the button.	Redesign the report button, use the word "Attendance Report" to replace the word "Report", this change will make the user feel comfortable when doing this task. Additionally, add the report icon or image on the left part of the button, it will also help the user to recognize the button.
In task 3: Users may have trouble noticing and realizing the "+" button is used for adding a new event. They will try to click on the date on the calendar to add an event. Time P3 3.29 P4 7:41 P5 8:39	Three of five participants exhibited this problem. Participant 3 did not notice the "+" button, which is required to add an event. Participant 4 needed our instructions to finish this task rather than intuitively do it on her own. Participant 5 confused about the step of the task, and he did know how to add an event since there is no such a signifier.	1	2	The participants did not consider that the "+" icon is a button to add a new event. It might because the signifier (Norman's principle) of the add event button is unobvious. In addition, there is no instruction next to the button. Designers should place instructions in context in which they are needed (human memory). Thus, users would be harder to find the button without any instructions.	Redesign the "+" icon into a button named "add event", and use light blue background color to make it more obvious. This design change will allow the user to clearly see it when they want to add a new event.
In task 3: Users may take more time on selecting the participants. They would click the row rather than the checkbox. Time P3 4:36	One of five participants encountered this problem. Participant 3 clicked the row to select the participants, but it did not work, so he spent more time finding that clicking the checkbox was the correct operation.	3	3	According to Fitts' Law, the larger the target, and the closer the pointer is to it, the faster a person can move the pointer to the target. Since the targets to select the participants are just the small checkboxes, users will spend more time to move the pointer to the checkbox.	Increase the area which can be used to select the item, so users only need to click the row to select the item, and it will save some time.
In task 4: Users may click "Done" button to submit the request without finishing all required information. Time	Two of five participants exhibited this problem. Participant 2 forgot to set the ending time and she goes straight to click done. Participant 5 tried to ask for a leave set with a starting time and an	2	2	Designers should add constraints to prevent errors (Human error design implications). However, there is no constraint when users have not completed all the required information, so users will not notice that they need to complete the task comprehensively which will cause errors. Moreover, the	1. Let the "Done" button cannot be click until all setting are finished, it will extremally avoid the situation of submitting the request without completing everything. 2. Do not preset the starting time and ending time, it will let users know that the time has not been

P2 6:57 P5 12:20	ending time, but he just finished setting the starting time and then click done.			preset starting time and ending time will give the users the illusion that the time settings have already been completed. In addition, the system did not provide feedback when the user has not finished setting the time and goes straight to click "done". It did not match the principle from Norman's concept of “Feedback”.	set.
In task 5: Users may not notice the “+” button to click to add new contacts. Time P2 9:03 P4 11:59	Two of five participants encountered this problem. participant 2 did not notice the “+” icon on the top right in the contact page, so it takes some time for her to figure out how to get to “Add Contacts” page to create a company group. Participant 4 did not notice the “+” icon either, he clicked "group" button rather than clicking "+" button at first time.	2	2	Some of the participants did not notice the “+” button at first, it might because the signifier (Norman’s principle) of this button is unobvious. In addition, there is no instruction next to the button. Designers should place instructions in context in which they are needed (human memory). Thus, users would be harder to find the button without any instructions.	Replace the small “+” button with a bigger button with an icon and textual label “Add New Contacts”, it will make users see it more clearly.
In task 5: Users may be confused about how to search and add an individual contact. Time P5 16:48	One of five participants encountered this problem. Participant 5 was confused about how to search and add a contact and he did not know which button is for add a new contact. He tried to search with the input box on “Contacts” page, but failed, since we did not design the function of it on that page.	2	3	Since human perception is biased, so designers should “avoid ambiguity” (Johnson’s text). The textual labels of the row are not clear enough for users to know which one is for adding a friend. When participants want to add a friend, they would seek for the word “friend” but they cannot find it, so the problem will occur.	Replace the class name “Add Contacts” with “Friends” and replace the button name from “Search Contacts” to “Search and Add a Friend”, it gives a keyword “Friend” and will reduce the ambiguity of this button.

*Provide participant number and time of all relevant incidents documented in critical incidents log, e.g., “P1 2:32; P3 4:39”

APPENDIX G: SEVERITY AND SCOPE RATINGS

Severity and scope ratings are included to communicate which problems are most important.

Severity

Severity is an assessment of a problem's impact on user performance. The following scale is derived from Dumas and Redish (1993):

- **Severity 1** problems prevent users from completing a task. Participants give up after a few tries or they need a hint to continue. For example, users consistently select an incorrect dialog option and do not know what else to do.
- **Severity 2** problems create significant delay and frustration. Participants continue to get lost or to use inefficient methods to accomplish a goal. For example, the lack of feedback to users confirming what they have just done causes them to do the task over to make sure they did it correctly.
- **Severity 3** problems have a minor effect on usability. For example, an unusual term in a dialog causes users to hesitate for a moment before making the correct choice.
- **Improvements**. While not problems *per se*, improvements will make the task even easier to perform or learn. The interface doesn't hamper users but there is something that could make it even better.

Scope

Scope is an assessment of how frequently users will encounter a problem. The more users that a problem affects, wider its scope.

* **Scope 1** problems will affect almost all users.
* **Scope 2** problems will affect many users.
* **Scope 3** problems will affect few users.