University of Nottingham
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COMP2044 Human Computer Interaction

Coursework 2: Evaluation

Group 7

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Chapter 1

Introduction

1.1 Purpose of the Prototypes

To meet the growing demand for campus event management, the University of Nottingham Ningbo (UNNC) needs to develop a mobile application to help teachers and students easily discover and RSVP for various campus activities, such as social, academic and professional activities. The development of this low-fidelity prototype aims to provide a reference model for subsequent application development, ensure a smooth development process, and achieve good human-computer interaction design at an early stage, thereby reducing the additional modifications that may occur in subsequent system development, saving time, manpower and resources.

1.2 Research Objectives

The main goal of this evaluation is to record the user experience and determine the best design solution to improve the usability and user satisfaction of the application. The evaluation will focus on several specific goals, such as whether the prototype has sufficient feedback mechanisms (such as pop-up prompts), whether there are clear guidelines for different tasks to help users complete specified behaviors, and whether the overall page information is sufficient and clear. By achieving these goals, the evaluation will provide more sufficient reference for subsequent prototype improvements, helping to design prototypes that are more in line with human-computer interaction principles and improve user experience.

Chapter 2

Methodology

This evaluation uses three evaluation methodologies to evaluate the usability of the RSVP function and the reminder settings in Coursework 1, such as cognitive walkthrough(CW), collaborative evaluation, and the system usability scale (SUS). These methodologies analyze prototype task efficiency, user feedback, and usability.

2.1 Cognitive Walkthrough

Cognitive walkthrough is a task-oriented technique that mimics the user's problem-solving process to assess the usability of a prototype and does not involve real users (Polson et al., 1992). During a cognitive walkthrough, each review expert answers a list of questions in Figure A.4 according to the user flow in the prototype. Since emotional attachment can make it difficult for designers and stakeholders to objectively assess their designs' strengths (Dam & Teo, 2020), each member evaluated another person's work. This method identifies potential usability issues based on cognitive principles.

2.2 Collaborative Evaluation

Collaborative evaluation is a user-centered approach that collects qualitative usability data through direct user participation (Monk et al., 1993). Recruited participants from other COMP2044 groups signed a consent form and were asked to complete two tasks while expressing their thoughts using the Think Aloud Protocol (TAP) (Nielsen, 1994). This process allowed us to capture users' cognitive processes and help identify potential issues in the interface. A moderator guided interactions while another team member

recorded key data, including task completion time and accuracy (Flaherty, 2022). We used a structured data collection method based on the HTA in Figure 2.1 and Figure 2.2 and analyzed quantitative and qualitative feedback to guide prototype improvements.

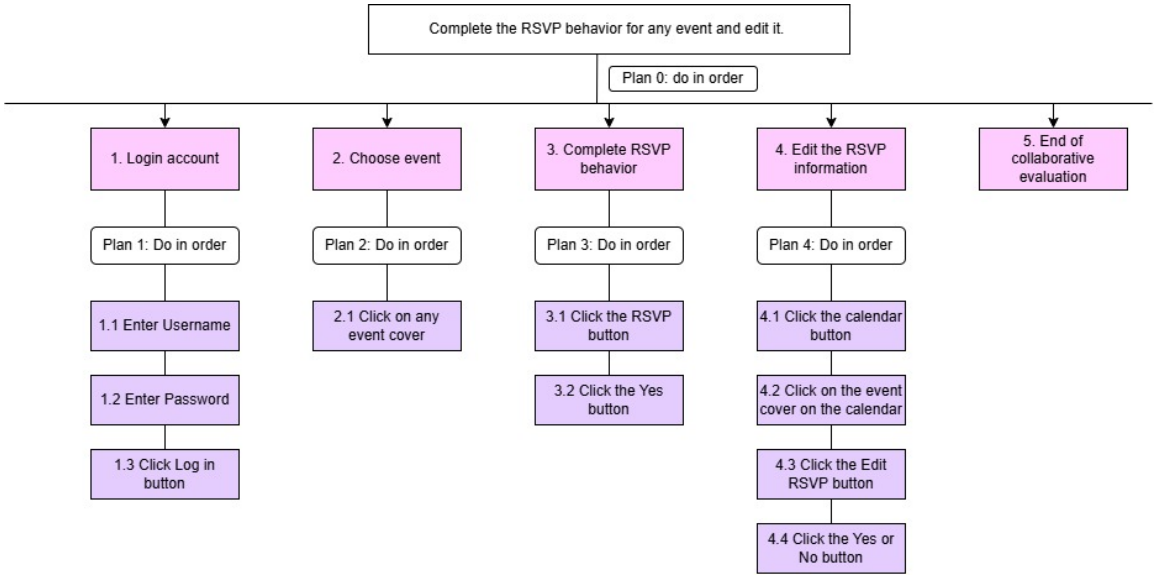

Figure 2.1: *HTA for Collaborative Evaluation Task 1: Complete the RSVP behavior for any event and edit it.*

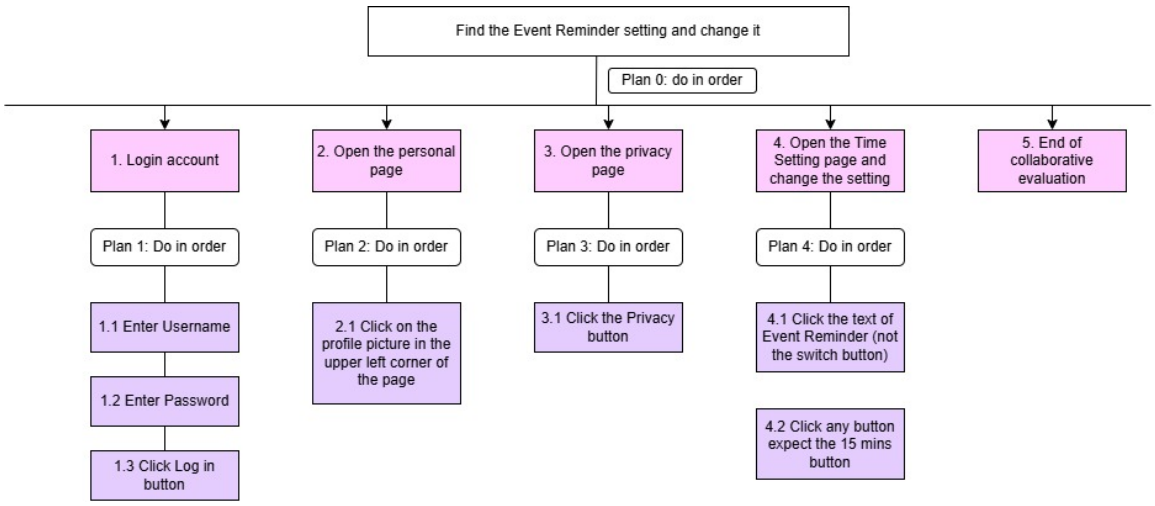

Figure 2.2: *HTA for Collaborative Evaluation Task 2: Find the Event Reminder setting and change it.*

2.3 System Usability Scale

The System Usability Scale (SUS) is a widely used evaluation tool designed to measure the overall user satisfaction with a system. It consists of ten questions covering aspects such as the ease of use, functionality, and user experience of the system. Each question is rated

on a five-point scale from "strongly disagree" to "strongly agree" (Jordan et al., 1996). After the collaborative evaluation, we asked participants to complete a paper version of the SUS questionnaire developed by Jordan et al. (1996) to rate the overall usability of the prototype. This data (see A.2) will be used for quantitative analysis and the results will be made into a bar chart to help us further understand the user's perception and feedback on the prototype, thereby providing guidance for subsequent prototype improvements.

2.4 Evaluation Planning and Implementation

Before involving users, our team first conducted a cognitive walkthrough (CW) and a system usability scale (SUS) to evaluate other members' prototypes. Then we voted to select the prototypes to be used for Collaborative Evaluation, which involves two specific evaluation tasks: using the RSVP function and setting the reminder time and modifying it to 20 minutes in advance.

During the Collaborative Evaluation, the participants were guided by a moderator to ensure that they could proceed smoothly according to the scheduled tasks, while another team member was responsible for recording the time and various reactions of the participants during the task execution. After all participants completed the task, the participants filled out the paper version of the SUS questionnaire for system satisfaction evaluation. The paper questionnaire was selected for offline testing in order to standardize the test conditions and avoid the potential interference of the unstable network environment on the test results (Albert & Tullis, 2013). At the same time, the researchers could directly observe the operation process of the participants, thereby effectively improving the reliability and validity of the data (Albert & Tullis, 2013).

Subsequently, we entered all questionnaire data into the SUS website to generate the final score. Finally, the collected quantitative and qualitative data were systematically summarized and analyzed. Regarding data processing, literature research, and drawing tasks, two team members were assigned to each task to ensure that each member could participate in the specific tasks. After the data was collated, the team members wrote the final report in accordance with the division of labor to ensure that the tasks were distributed fairly and all members could participate.

Chapter 3

Results

3.1 Prototype Selection

In terms of prototype selection, the team chose the prototype of Member 2.

3.1.1 Selection Justification

Each teammate's Cognitive Walkthrough (CW) response is in the appendix A.3 and the team's calculated SUS questionnaire score is in 3.1. However, during the process of collecting and comparing the questionnaire data, we noticed that the CW results were inconsistent with the results of the SUS questionnaire. The team recorded this phenomenon and discussed it in detail in Subsection 4.1.1. Due to inconsistency between the results of the two questionnaires, the team finally decided to select the prototype with the best response, highest functional completion rate, and highest prototype fidelity among the CW.

ID	Name
1	Zelin XIA
2	Yuyang ZHANG
3	Haotao WANG
4	Yixuan ZHOU
5	Qinghua ZHANG
6	Yicong WEI
7	Sihan ZHANG

Table 3.1: Member information corresponding to the Member ID

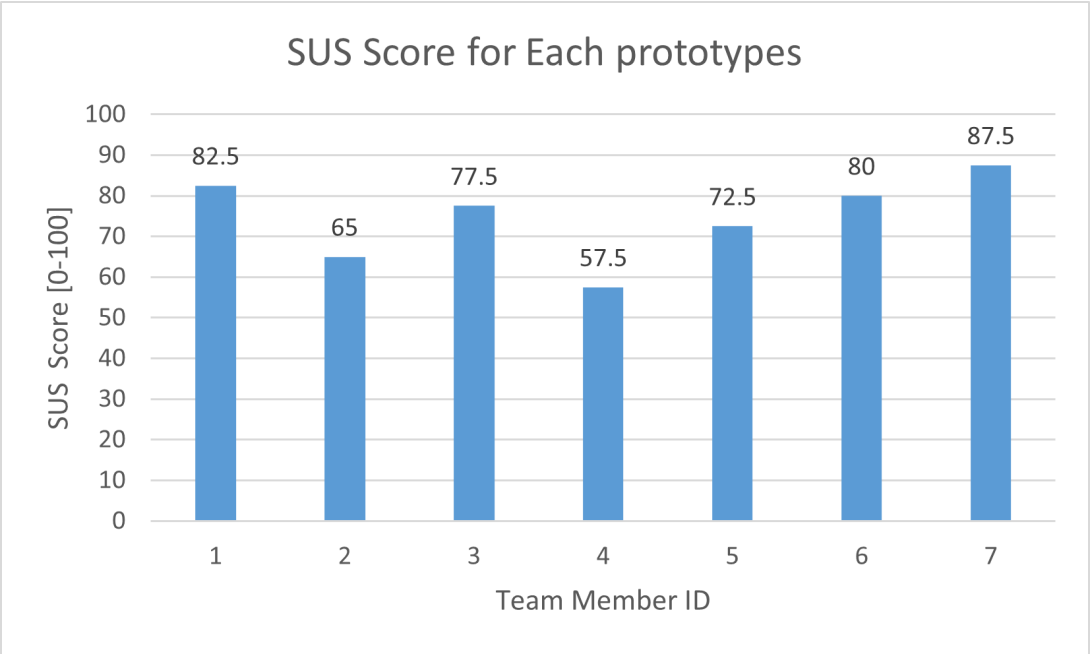

Figure 3.1: *SUS Scores for Cross-Member Prototypes*

3.2 Collaborative Evaluation Results

3.2.1 Analysis of RSVP Functionality and Event Editing

Participants effectively performed all sub-tasks, including logging in, checking event details, confirming RSVP, and editing RSVP. Even though the tasks were carried out successfully, some participants were confused about a few steps. For instance, many participants were puzzled on how they edited RSVP. Participant 5 misunderstood the editing function, assuming it was meant for altering event details instead of participation status. Participant 8 mentions specifically the "Edit RSVP" button, which she finds confusing; a number of other participants echo the same sentiments and notice that the button is not clearly labeled. Participant 3 does not understand why she cannot see the list of participants before confirming their names to be sure they are the right ones, and recommends having this list accessible. Additionally, participant 4 noted unclear activity timing expressions, causing hesitation during task completion. Based on the data shown in figure 3.2, the highest recorded time is 6.63 minutes, which was by Participant 4. There are notable interface inefficiency issues, yet these are overshadowed by the 3.43 minutes (Participant 7) completion time. Another instance that is given in figure 3.3 shows a situation in which the average time is 5 minutes, a point that is highlighted through the unclear prompts of the interface and the button labeling.

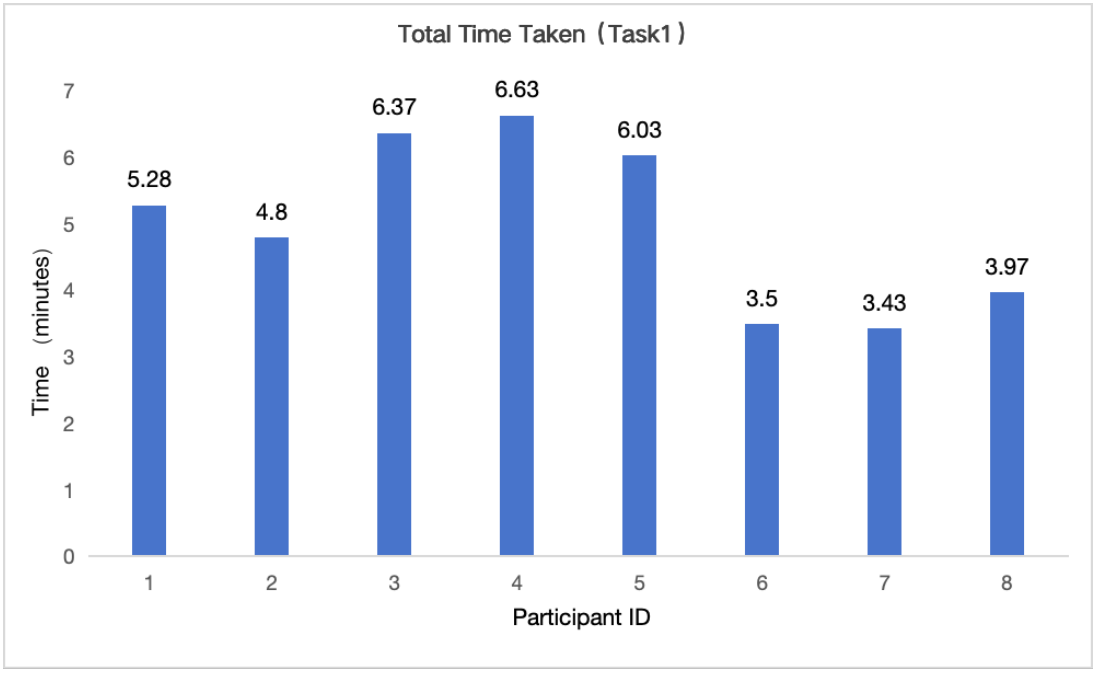

Figure 3.2: *Task1-total-time*

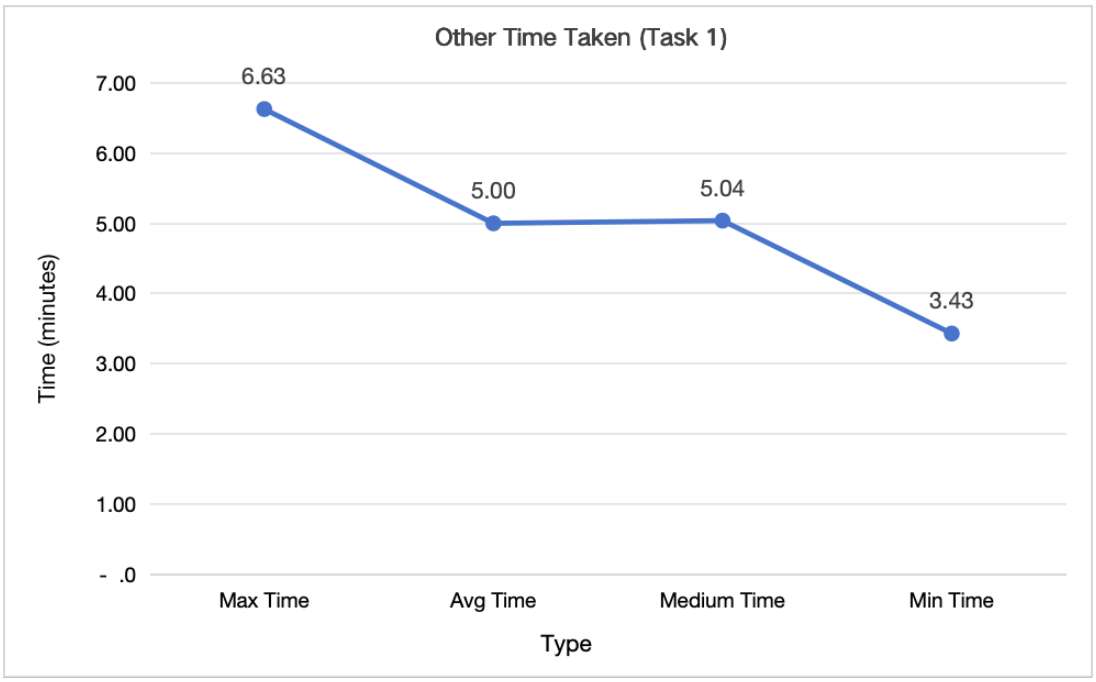

Figure 3.3: *Task1-Aggregated-Time-Statistics*

3.2.2 Analysis of Event Reminder Settings

Task 2 presented greater challenges, particularly finding the Personal Page and Privacy Page. Since the icons and labels were either unclear or misleading, the majority (those by Participants 1, 5, and 6) clicked on the calendar initially. The theme of the task was further represented by participant statements of confusion, particularly concerning the Privacy icon, like Participants 3, 4, and 7, who voiced uncertainty about its meaning. Participant 5 could not activate the event reminder due to insufficient interface prompts, explicitly highlighting the absence of clear messaging. An important thing about this is that it explicitly points to the lack of clear message in the interface. Participant 8 also suggested an addition of the confirming button at the options selection stage to provide feedback to the user and thus eliminate uncertainty about whether or not they have made the changes. Additionally, Participant 6 pointed out the lack of prominence for the event reminder switch, suggesting enhancements in visual hierarchy. The figure 3.4 and figure 3.5 inform you statistically, showing an average time of 3.38 minutes and a maximum time of 4.42 minutes, which unequivocally demonstrates the effect of insufficient direction and visuals on task performances.

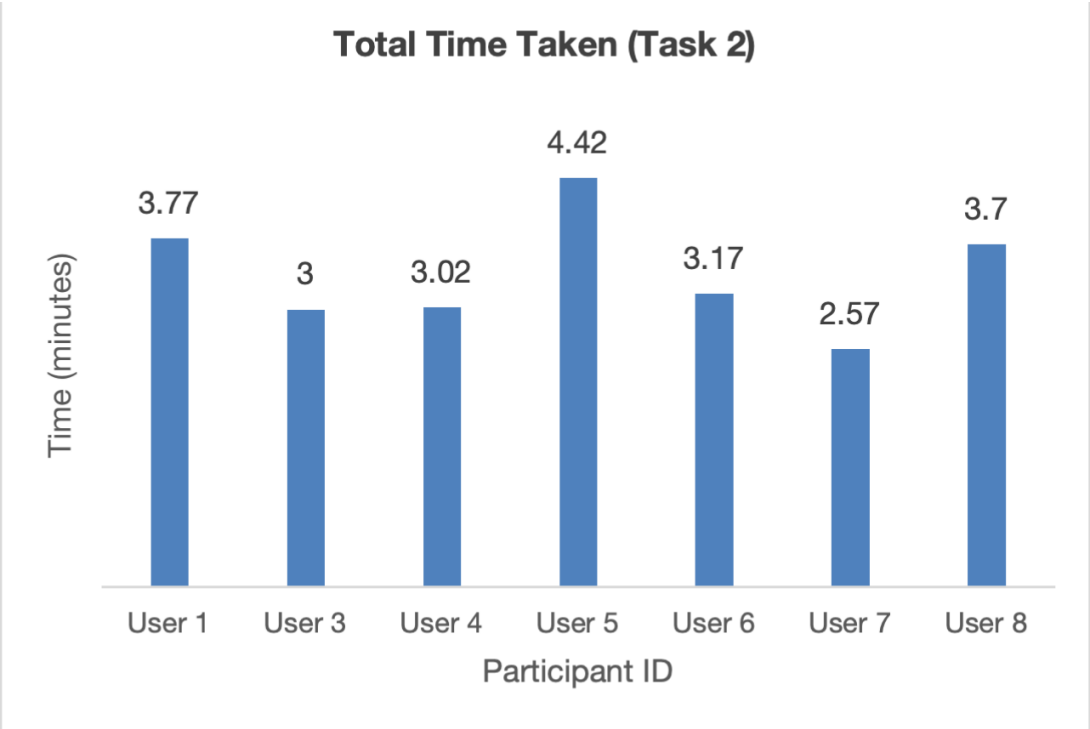

Figure 3.4: *Task2-total-time*

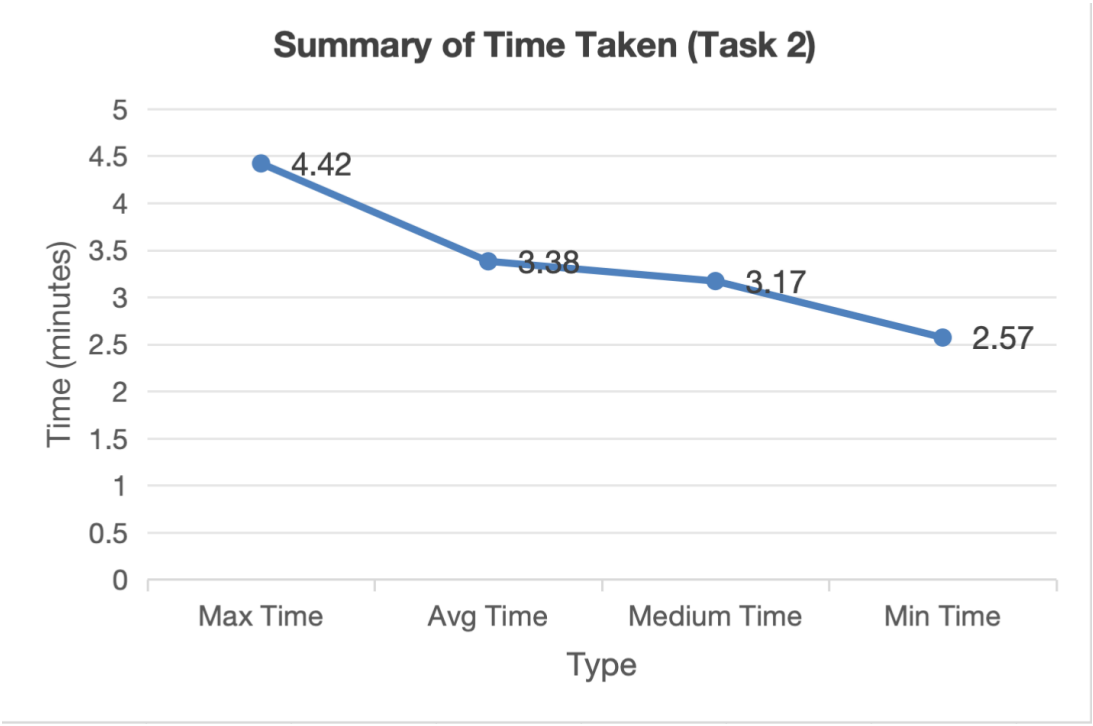

Figure 3.5: *Task2-Aggregated-Time-Statistics*

3.3 System Usability Scale (SUS) Results

The System Availability Scale (SUS) is an important tool used to quantify user satisfaction in this assessment. When the user completes two tasks in the collaborative evaluation, they fill out the questionnaire.The first following figure shows the System Usability Scale (SUS) scores, which are based on the paper SUS questionnaires filled out by users. These quantitative usability metrics were generated through a manual data entry process, where the team transcribed the responses from the paper questionnaires into the online SUS scoring algorithm (URL: https://stuart-cunningham.github.io/sus/). And the other figure shows the summary of the SUS scores.

There are 8 users who participated in filling out the SUS questionnaire, which is attached in the appendix A.4. The SUS questionnaire has a scoring range of 0 to 100 points. In this evaluation, the maximum score obtained by the users was 82.5 points, indicating that this user gave a very high evaluation of the system's usability. The minimum score was 40 points, suggesting that some users had relatively low satisfaction with the system. The average score for all users was 67.5 points.

As shown in the figure 3.8, the average SUS score illustrates the correlation between adjective ratings, acceptability scores, and school grading scales. The SUS scores we collected currently fall between the "OK" and "Good" adjective ratings, indicate a "high marginal"

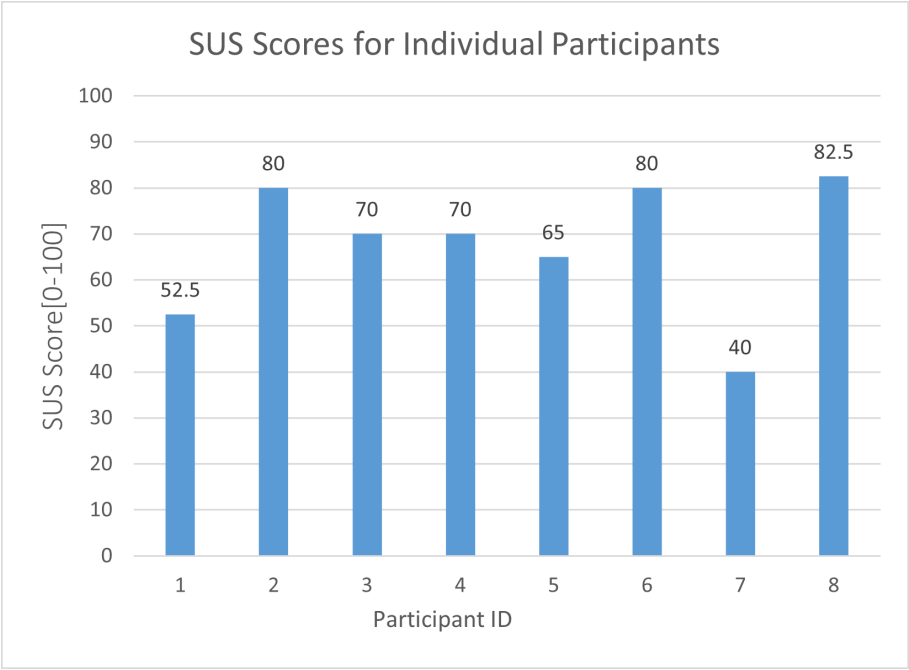

Figure 3.6: *Overview of SUS scores for individual participants in graphical form*

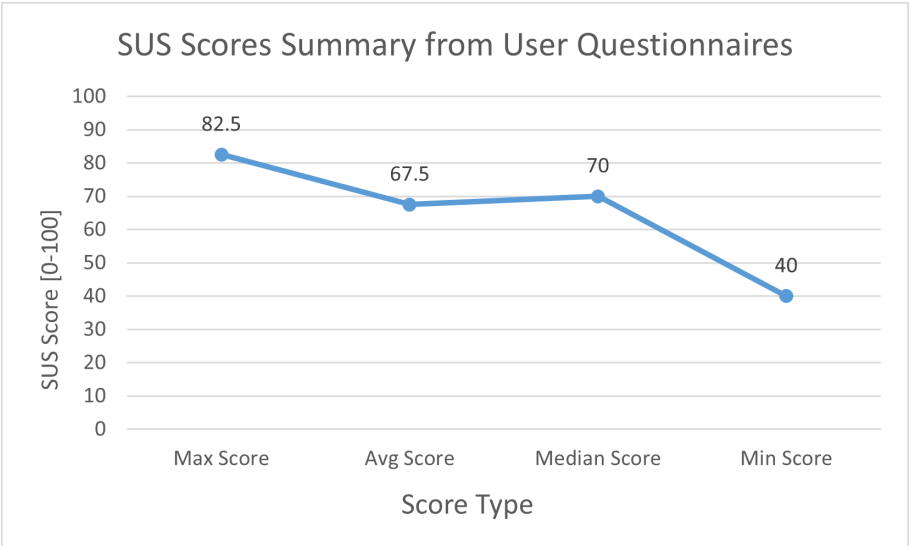

Figure 3.7: *Summary of SUS scores for individual participants in graphical form*

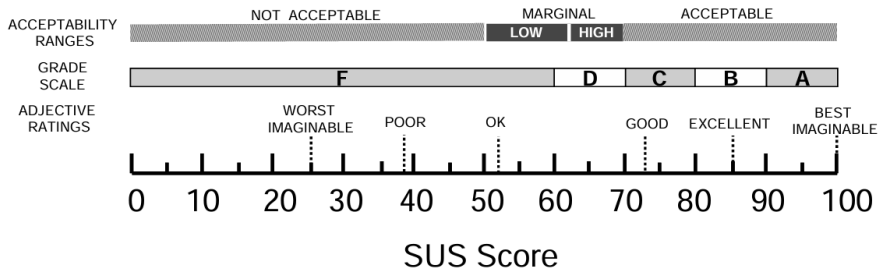

Figure 3.8: *A comparison of the adjective ratings, acceptability scores, and school grading scales, in relation to the average SUS score(adapted from(Bangor et al., 2009))*

acceptability, and correspond to a "D" grade on the school grading scales.

3.4 Result Discussion

This discussion successfully examined the usability of the RSVP system by analyzing the results of collaborative evaluation (cognitive walkthrough and task-based user testing) and the System Usability Scale (SUS). The average SUS score is 67.5 (shown in Figure 3.7), this indicated that the prototype used as a survey template demonstrated higher usability than expected. A more in-depth analysis uncovered subtle discrepancies and consistencies between subjective user perceptions and objective task performance metrics. By placing these insights in the context of Human-Computer Interaction (HCI) principles, we further illustrate our deficiencies in system design and thus gain deeper insights into user behavior patterns.

3.4.1 Consistency Between Methods

- **High SUS score reflects overall efficiency**

  The score of SUS reflects the overall efficiency. The high average score of SUS is consistent with the high task completion rate in the collaborative evaluation where users must complete simple operations such as logging in and selecting time options. It also demonstrates that, when completing the collaborative evaluation task, users find the system's design to be supportive.

- **The tasks verified by the two methods have common deficiencies**

  During the collaborative evaluation process, key issues were identified when editing RSVP information and accessing privacy settings, which were responded to in

the SUS comments on complexity (e.g., "The system is unnecessarily complex"). Controls like the "Edit RSVP" button lack clear indications, which violates users' expectations of immediate feedback (Norman, 2013).

3.4.2 Contradictions Between Methods

- **Paradox of high SUS score amid task failures**

  Users with high SUS scores still face non-negligible challenges when completing collaborative evaluations. In Task 3 (accessing the privacy page), without assistance from collaborators, most users failed to associate the time reminder with the "privacy" label. However, the SUS did not explicitly capture this inconsistency. This indicates that users may have made this mistake due to the system's illogical grouping. In Task 5 (editing RSVP), a small number of users struggled to identify ambiguous labels, yet the SUS score remained high. This discrepancy could arise because users evaluated the system holistically rather than focusing on granular frustrations (Sauro & Lewis, 2016). This represents an identified conflict.

- **Time efficiency and cognitive load**

  The average task completion time (approximately 4 minutes) masks extreme outliers (for example, User 4 of Task 1: 6m 63s). SUS focuses on users' subjective perception of efficiency (for example, "I think the system is easy to use"), but fails to capture the tension experienced by users when they need to browse features such as the "personal page" for a relatively long time in the collaborative evaluation. This contradiction highlights the inability to represent the survey results with behavioral indicators in SUS.

3.4.3 Deeper Insights

- **Mismatched mental models**

  Problems such as terms (e.g., classifying time reminders under "Privacy") and ambiguous labels (e.g., "Edit RSVP") stem from the disconnection between user expectations and the classification of system modules. These issues conflict with (Johnson-Laird, 1983) mental model theory, which posits that users interpret interfaces based on pre-existing cognitive frameworks. When the system logic deviates from its internal framework, users will experience cognitive dissonance. Similarly,

(Kieras, 1984) demonstrated that mismatched terms (e.g., "Edit RSVP" vs. RSVP "Modify participation status") increase cognitive load, and arbitrary labels of the system must be understandable to users.

- **Accumulated frustration**

  The extended task completion time (e.g., 4 minutes and 63 seconds for the user) indicates system inefficiency may induce user frustration. This phenomenon is consistent with (Sweller, 1988) cognitive load theory, which holds that poor design brings additional mental demands and overwhelms the user's working memory. (Polson & Lewis, 1990) emphasized that although an individual task might eventually be completed, cumulative usability problems will reduce user satisfaction.

- **Role of evaluator prompts**

  The performance of users varies depending on the different prompt contents of the assisting evaluators highlighting the influence of the intervention of the assisting evaluators on the task outcome. This observation resonates with the meta-analysis of usability studies by (Hornbæk & Law, 2007), which demonstrated that subtle guidance, such as prompts, can artificially inflate success rates while potentially obscuring underlying design issues.

Chapter 4

Discussion

4.1 Finding During Evaluation

4.1.1 Contrasting User Feedback in CW and SUS Evaluations

During the process of selecting and evaluating the prototypes by the team, the team found that there were some differences between the CW user feedback and the SUS.

- **Problem Description**: When the group was doing Stage 1 of the task, the group conducted an interactive cognitive walkthrough evaluation of the prototypes of the group members. During the evaluation process, in order to more intuitively display the evaluation results, the group asked each member to fill out the SUS questionnaire based on the evaluated prototype and calculate the SUS questionnaire score. After comparing the cognitive walkthrough results with the corresponding SUS questionnaire scores, the group found that some prototypes with good cognitive walkthrough results obtained lower SUS scores than some prototypes with poor cognitive walkthrough results.

- **Discussion**: After observing this phenomenon, in order to avoid the same problem in the collaborative evaluation stage, the team conducted a corresponding cause analysis and literature research on this problem, and finally came up with the following reasons:

    1. **Two-dimensional impact of prototype appearance and function of the prototype**

       The appearance and functionality of a prototype play a dual role in the shap-

ing of usability evaluations, and their effects may differ between CW and SUS. SUS measures overall user satisfaction and may be influenced by visual appeal. Empirical evidence supporting this two-dimensional effect emerged from a prototype evaluation study comparing different levels of fidelity (paper-based, computer-generated, and fully operational prototypes) and aesthetic qualities (Sauer & Sonderegger, 2009). The study found that aesthetically pleasing prototypes scored higher in usability and evoked more positive emotions, implying that users overestimated aesthetics in low-fidelity prototypes. The study also found a significant interaction between fidelity and aesthetics, with the effect of aesthetics being more pronounced in fully functional products. This dual effect may explain why some prototypes with good CW results (focused on functionality) may receive lower SUS scores (influenced by appearance), as SUS captures a wider range of user perceptions, including emotional responses to the design.

2. **Insufficient sample size**

   If the SUS is evaluated with too few participants, some prototypes with good CW results may have low SUS scores. A 2022 article (Sauro, 2022) provides detailed guidance on sample size requirements based on desired confidence levels and margins of error. The study uses a standard deviation of 17.7 and provided the following table for sample size estimation. According to the figure, to achieve a confidence level of 95% with a margin of error of $\pm 5\%$, 51 samples are required, while $\pm 10\%$ only requires 15 samples (Sauer & Sonderegger, 2009). This may explain why some prototypes with good CW results may have low SUS scores if they are evaluated with too few participants.

4.1.2 Key Usability Issues

Our Stage 2 collaborative walkthrough uncovered several "speed bumps"in the interface that led to task failures and user frustration. Below we describe each issue, note which HCI principle it breaks, and report how many participants were affected.

1. **Confusing Menu Labels.** Two of seven participants looked under "Calendar" or "Notifications" but never found the Personal Page (Task 2). The label "Personal"

d	SUS; 90%	SUS; 95%
15	6	8
10	11	15
7.5	17	24
5	36	51
2.5	138	195
2	214	304
1	850	1,206

Table 2: Sample size requirements for various SUS confidence intervals (*s* = 17.7).

Figure 4.1: *A screenshot of sample size requirements for various SUS confidence intervals (s = 17.7). Accessed at: https://measuringu.com/sample-sizes-for-sus-ci/*

felt too generic and didn't match users' real-world expectations (Nielsen, 1994). Those two users ended up with a success rate of 0% in Task 2.

2. **Misleading Iconography.** All seven participants failed to open the Privacy page (Task 3) because the padlock icon didn't intuitively signal time-related settings. Breaking consistency and standards makes people second-guess what an icon means (Monk et al., 1993). Task 3 suffered a 100% error rate.

3. **Hidden Primary Controls.** Two participants completely overlooked the "Event Reminder" switch (Task 4). The toggle was small, low-contrast, and buried in a submenu-important controls should jump out at you (Norman, 2013). Those users had a 0% completion rate on Task 4.

4. **Ambiguous Action Buttons.** During RSVP editing (Task 1), three participants hesitated because the "Edit RSVP" button offered no clear cue and provided no immediate success feedback. Every action should deliver instant feedback so people know it worked (Polson et al., 1992). Their hesitation added an average of 30 seconds to Task 1.

5. **Lack of Confirmation Feedback.** Although everyone could select "20 Minutes" for reminders (Task 5), one person suggested adding a "Confirm" button to feel certain their choice stuck. Without that, they felt "in the dark" about whether it actually changed (Albert & Tullis, 2013). This uncertainty slightly lowered satisfaction scores in our post-task survey.

4.2 Design Recommendations

4.2.1 Design Recommendations

Based on the comprehensive analysis of cognitive walkthroughs, collaborative evaluations, and System Usability Scale (SUS) scores, we propose the following design recommendations to enhance the usability and user satisfaction of the prototype. These recommendations are divided into two main categories: immediate fixes and long-term improvements.

- **Immediate Fixes**

    1. **Enhance Feedback Mechanisms:** A dedicated feedback page should be added to provide users with clear, actionable responses after key interactions, such as submitting an RSVP or changing a reminder setting. In addition, revise ambiguous feedback messages to make them more intuitive and informative. For instance, after editing RSVP details, a confirmation popup should state "Your RSVP has been successfully updated" instead of a vague "Saved."
    2. **Improve Guidance and Instructions:** Essential guidance elements should be integrated, especially for first-time users. Tooltips and short, task-specific tutorials can assist users in navigating unfamiliar features. For example, a step-by-step guide can explain how to locate and modify event reminders, addressing confusion noted during the evaluation.
    3. **Refine Button Labels and Icons:** Labels such as "Edit RSVP" and icons like the padlock for reminder settings should be replaced with more meaningful alternatives (e.g., "Modify Attendance" or a bell icon for reminders). This aligns with users' mental models and improves clarity.

- **Long-Term Improvements**

    1. **Redesign Layout of Event Reminders:** The event reminder feature, currently buried within the privacy section, should be relocated to a more prominent and logically connected area, such as directly under the event details page. This redesign requires collaboration between design and development teams to ensure feasibility and effectiveness, and should be reassessed through further usability testing.

2. **Increase Visual Hierarchy and Button Visibility:** Critical control elements like the RSVP and reminder toggles need improved visual prominence. This can be achieved through adjustments in size, contrast, and positioning. Enhanced visibility will reduce errors, particularly for novice users.

3. **Introduce Confirmation for Critical Actions:** Adding an explicit "Confirm" button for changes in settings (e.g., reminder time) will reinforce user confidence and reduce uncertainty, as suggested by participant feedback.

- **Prioritization Based on SUS Results**

  According to the SUS questionnaire data, we found the prototype's weakest points are relate to complexity and insufficient feedback. These items received lower average scores compared to ease-of-use metrics. Thus, the initial priority should be improving feedback clarity and simplifying task flows, especially around RSVP editing and reminder adjustments.

- **Considerations for Future Evaluations**

  1. **Broaden the Scope of Testing:** The current evaluation primarily focused on RSVP-related functions. Future evaluations should cover a wider range of prototype features to ensure comprehensive usability assessment.

  2. **Increase Sample Size:** While existing literature (e.g., Sauro & Lewis, 2016) supports the validity of SUS with small sample sizes, our current sample of 8 participants remains limited. Expanding the sample in future rounds will enhance the robustness of the findings and increase confidence in generalizability.

4.3 Conclusion

Overall, the team conducted a systematic evaluation of the usability of the UNNC event discovery and RSVP prototypes through cognitive walkthroughs, collaborative assessments, and system usability scales. The evaluation results showed that the prototype had some user-unfriendly issues, including suboptimal menu labels, confusing icons, and lack of feedback, which violated the basic principles of human-computer interaction and led to inefficient tasks. Although the average SUS score was 67.5 (indicating that the

usability was between "OK" and "good"), there was a difference between subjective satisfaction and objective task performance, especially in complex tasks (such as accessing privacy settings). These differences show that it is not enough to make judgments based on overall indicators such as SUS alone, and it is necessary to combine behavioral data to better understand the user experience. The team provided immediate and continuous improvement suggestions for these issues to make the system consistent with the user's mental model, reduce cognitive load, and improve interface clarity, striving to perfect a user-friendly prototype for the UNNC Event Discovery and RSVP system.

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Appendix A

Appendix

A.1 Evidence of Group Work

- **Offline Meetings**

  In figure A.1, we held two offline meetings to discuss the project progress and plan and divide the next steps. In these meetings, team members shared their work progress and gave each other feedback. These face-to-face discussions ensured that team members reached a consensus.

- **Wechat Group**

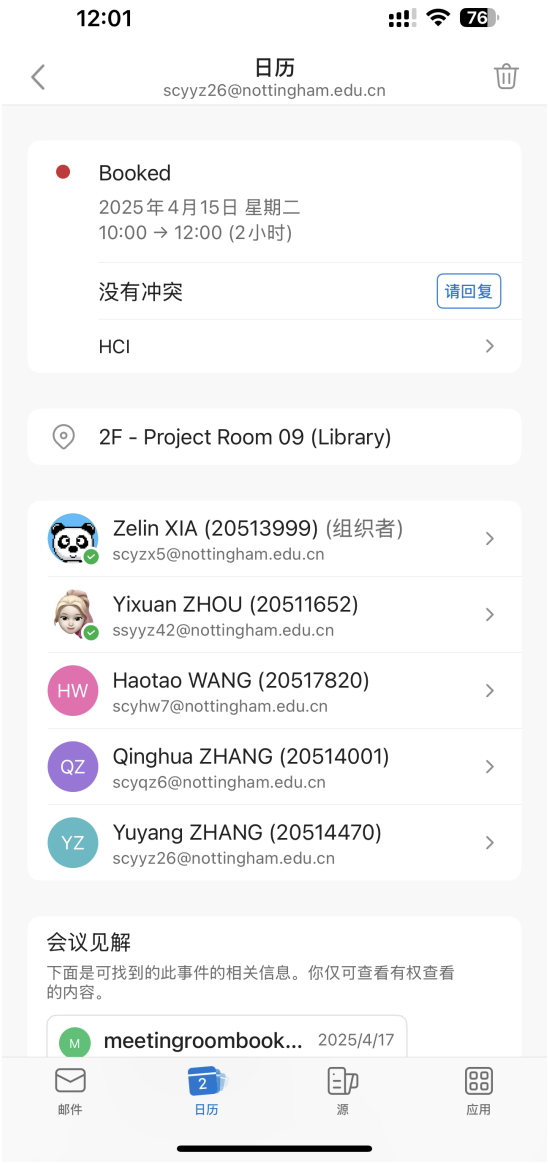
  To maintain continuous communication during the project, we set up a WeChat group in figure A.2 where members exchange ideas, discuss issues, and coordinate tasks. The WeChat group is particularly helpful for solving problems outside of meetings, ensuring that everyone can get timely information and participate in discussions.

- **Overleaf Group**

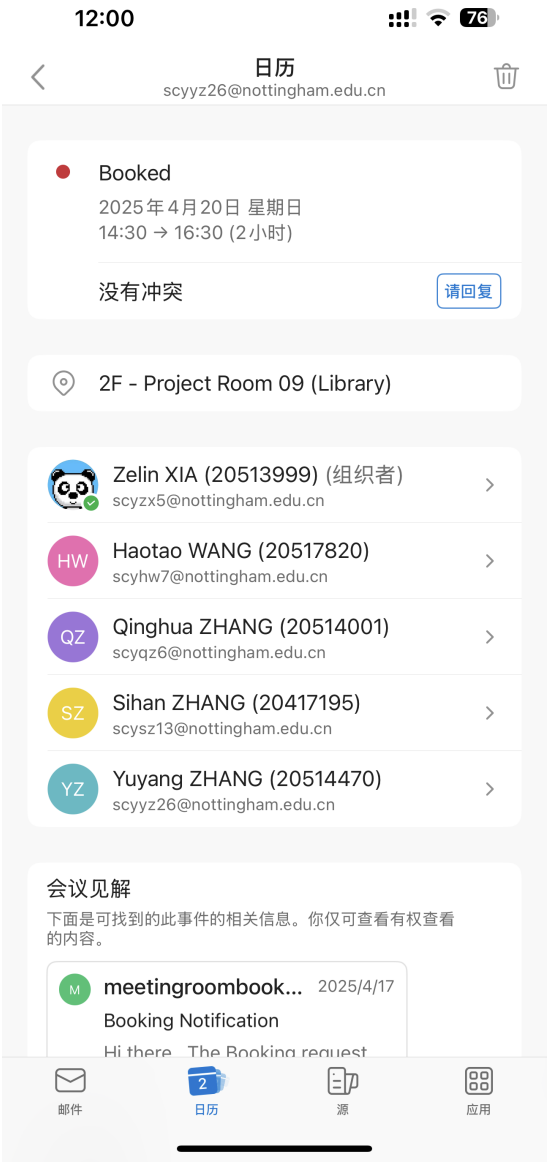
  We created an Overleaf shared document platfin figure A.3 for team collaboration in writing and editing reports. All team members can make changes, comments, and suggestions in real time. This collaborative approach improves work efficiency and ensures consistency and quality of report content.

- **Workshop**

  During the workshop, each team member actively participated and completed their tasks, ensuring the efficient progress of the tasks.



(a) *first meeting*



(b) *Second meeting*

Figure A.1: *Meetings*

Figure A.2: *Wechat Group*

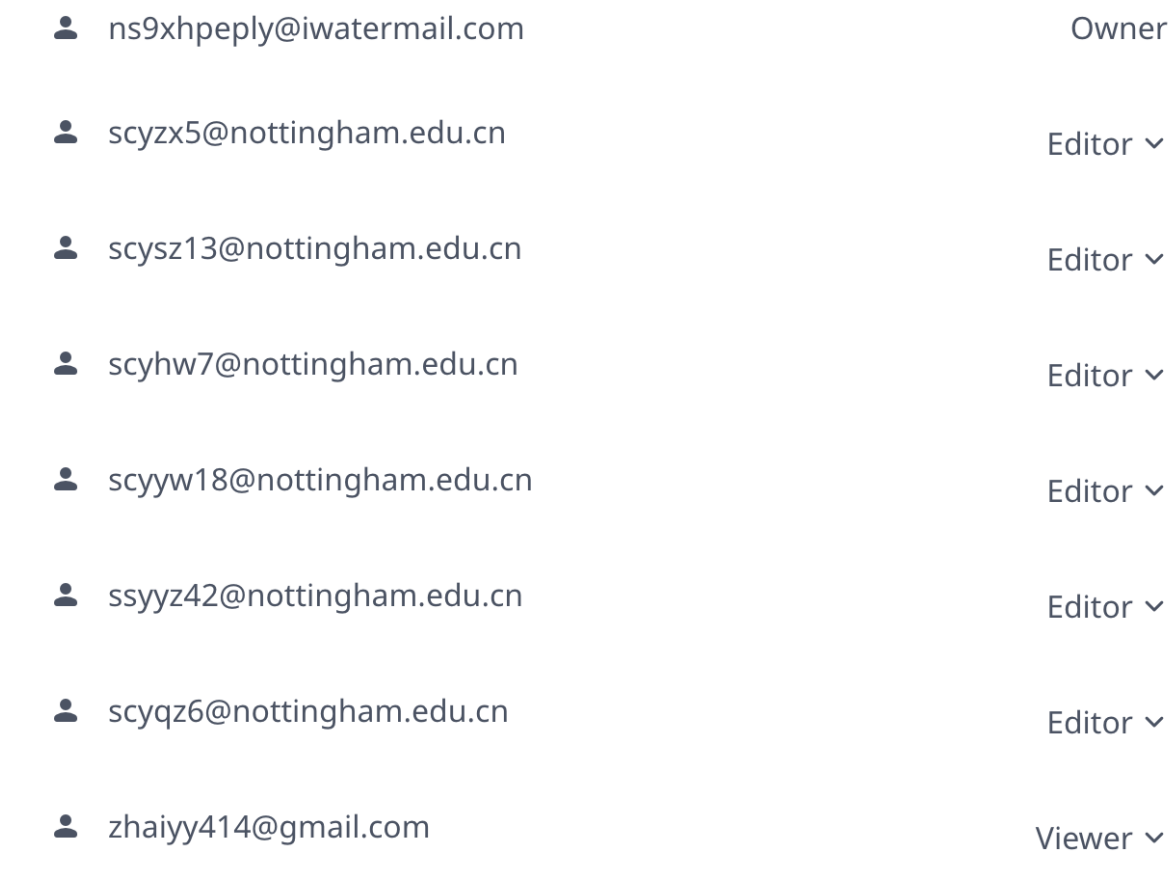
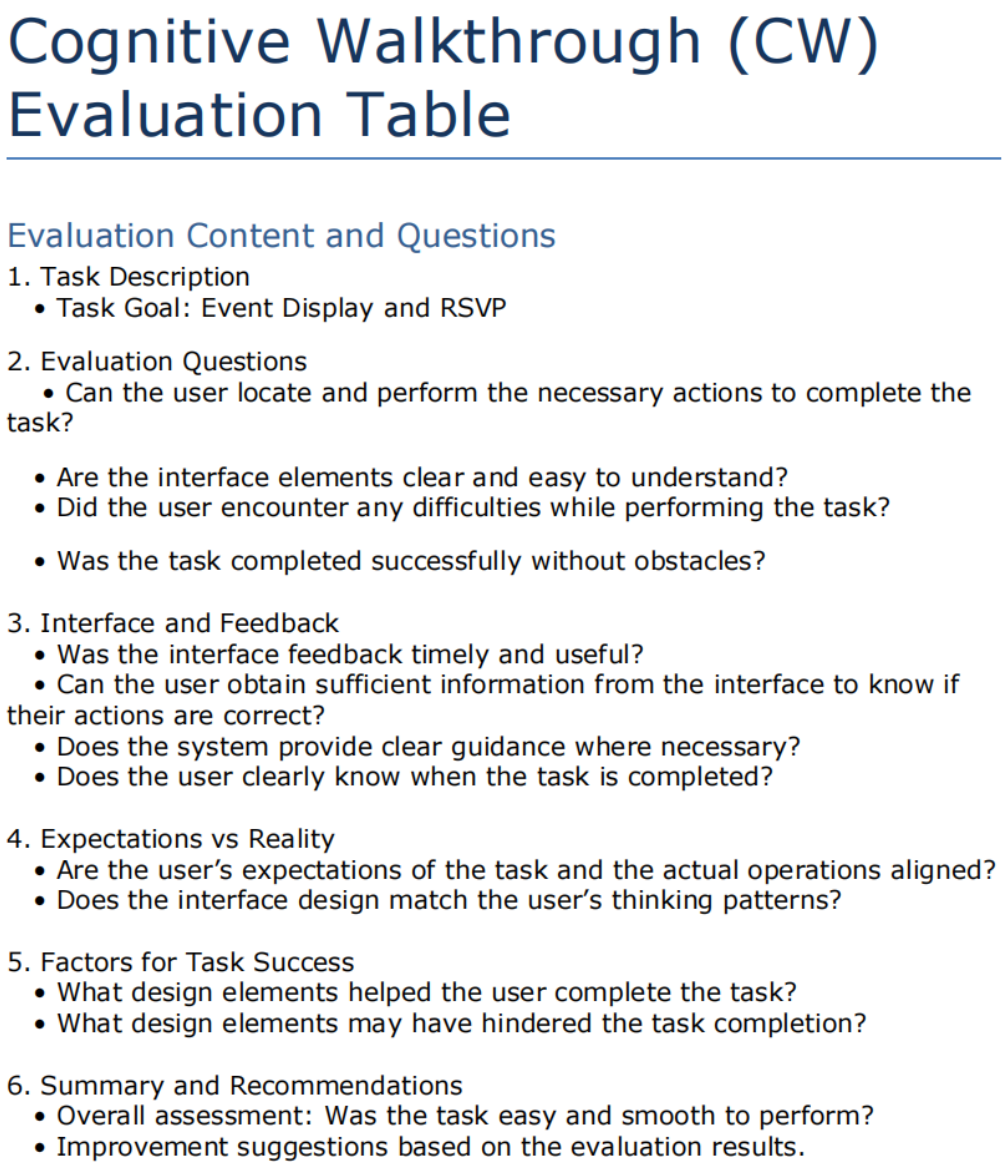


Figure A.3: *Overleaf Group*

A.2 Cognitive Walkthrough Evaluation Table

The CW table in figure A.4 we made when we selected a prototype within the group.



Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   - Task Goal: Event Display and RSVP

2. Evaluation Questions
   - Can the user locate and perform the necessary actions to complete the task?
   - Are the interface elements clear and easy to understand?
   - Did the user encounter any difficulties while performing the task?
   - Was the task completed successfully without obstacles?

3. Interface and Feedback
   - Was the interface feedback timely and useful?
   - Can the user obtain sufficient information from the interface to know if their actions are correct?
   - Does the system provide clear guidance where necessary?
   - Does the user clearly know when the task is completed?

4. Expectations vs Reality
   - Are the user's expectations of the task and the actual operations aligned?
   - Does the interface design match the user's thinking patterns?

5. Factors for Task Success
   - What design elements helped the user complete the task?
   - What design elements may have hindered the task completion?

6. Summary and Recommendations
   - Overall assessment: Was the task easy and smooth to perform?
   - Improvement suggestions based on the evaluation results.

Figure A.4: *CW Question*

A.3 CW responses

The CW response forms when choosing the prototype are as follows.

Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   • Task Goal: Event Display and RSVP

2. Evaluation Questions
   • Can the user locate and perform the necessary actions to complete the task?

Yes, the step analysis is very clear.

   • Are the interface elements clear and easy to understand? Yes.

   • Did the user encounter any difficulties while performing the task?

Basically not. However, if a person wants to subscribe to multiple activities at the same time, complex situations may arise.

• Was the task completed successfully without obstacles? Yes.
3. Interface and Feedback
   • Was the interface feedback timely and useful? Yes. Users can receive immediate feedback.
   • Can the user obtain sufficient information from the interface to know if their actions are correct? Yes.
   • Does the system provide clear guidance where necessary? Yes.

• Does the user clearly know when the task is completed? Yes.
4. Expectations vs Reality
   • Are the user's expectations of the task and the actual operations aligned? Yes.
   • Does the interface design match the user's thinking patterns? Yes. The interface is clear and not complicated.
5. Factors for Task Success
   • What design elements helped the user complete the task? Clear background layout, buttons that can provide feedback in time, dialog boxes of different roles, etc.

• What design elements may have hindered the task completion?
   The basic functions have all been implemented. When users want to delete the activities they have selected, the interactive keys are missing.
6. Summary and Recommendations
   • Overall assessment: Was the task easy and smooth to perform? Yes.
   • Improvement suggestions based on the evaluation results. If users want to delete the activities they have subscribed to, this deletion interface can be added.

Figure A.5: *CW response to the prototype made by Haotao Wang*

Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   • Task Goal: Event Display and RSVP

2. Evaluation Questions
   • Can the user locate and perform the necessary actions to complete the task? Yes

   • Are the interface elements clear and easy to understand? Not clear but easy to understand.

   • Did the user encounter any difficulties while performing the task? No
   • Was the task completed successfully without obstacles? Yes

3. Interface and Feedback
   • Was the interface feedback timely and useful? Yes
   • Can the user obtain sufficient information from the interface to know if their actions are correct? Yes.But not sufficient.
   • Does the system provide clear guidance where necessary? Yes. But not enouch.
   • Does the user clearly know when the task is completed? Sometimes the answer is yes.

4. Expectations vs Reality
   • Are the user's expectations of the task and the actual operations aligned? Yes
   • Does the interface design match the user's thinking patterns? Yes

5. Factors for Task Success
   • What design elements helped the user complete the task? Clear buttons, simple layout, text prompts

   • What design elements may have hindered the task completion? NONE
6. Summary and Recommendations
   • Overall assessment: Was the task easy and smooth to perform? Yes
   • Improvement suggestions based on the evaluation results.

Needs more colors and images, error prevention mechanisms, and insufficient integration with school systems.

Figure A.6: *CW response to the prototype made by Qinghua ZHANG*

Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   - Task Goal: Event Display and RSVP

2. Evaluation Questions
   - Can the user locate and perform the necessary actions to complete the task? Yes
   - Are the interface elements clear and easy to understand? Yes
   - Did the user encounter any difficulties while performing the task? No
   - Was the task completed successfully without obstacles? Yes

3. Interface and Feedback
   - Was the interface feedback timely and useful? Yes
   - Can the user obtain sufficient information from the interface to know if their actions are correct? Yes
   - Does the system provide clear guidance where necessary? Yes
   - Does the user clearly know when the task is completed? No

4. Expectations vs Reality
   - Are the user's expectations of the task and the actual operations aligned? Yes
   - Does the interface design match the user's thinking patterns? Yes

5. Factors for Task Success
   - What design elements helped the user complete the task? text prompts
   - What design elements may have hindered the task completion? NONE

6. Summary and Recommendations
   - Overall assessment: Was the task easy and smooth to perform? Yes
   - Improvement suggestions based on the evaluation results.

When selecting or searching for activities, more filtering criteria can be provided, which can allow users to quickly and accurately choose the activities they want.

Figure A.7: *CW response to the prototype made by Sihan ZHANG*

Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   • Task Goal: Event Display and RSVP

2. Evaluation Questions
   • Can the user locate and perform the necessary actions to complete the task?

Yes.

   • Are the interface elements clear and easy to understand? Yes.

   • Did the user encounter any difficulties while performing the task? No.

• Was the task completed successfully without obstacles? Yes.
3. Interface and Feedback
   • Was the interface feedback timely and useful? Yes. Users can receive immediate feedback.
   • Can the user obtain sufficient information from the interface to know if their actions are correct? Yes.
   • Does the system provide clear guidance where necessary? Yes.

   • Does the user clearly know when the task is completed? Yes.

   4. Expectations vs Reality
      • Are the user's expectations of the task and the actual operations aligned? Yes.
      • Does the interface design match the user's thinking patterns? Yes. The interface is clear and not complicated.
   5. Factors for Task Success
      • What design elements helped the user complete the task? Clear background layout, buttons that can provide feedback in time, dialog boxes of different roles, etc.

   • What design elements may have hindered the task completion? NONE
6. Summary and Recommendations
   • Overall assessment: Was the task easy and smooth to perform? Yes.
   • Improvement suggestions based on the evaluation results.

Effective notification should be made when the event begins

Figure A.8: *CW response to the prototype made by Yingcong WEI*

Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   • Task Goal: Event Display and RSVP

2. Evaluation Questions
   • Can the user locate and perform the necessary actions to complete the task? YES

   • Are the interface elements clear and easy to understand? YES

   • Did the user encounter any difficulties while performing the task? No
   • Was the task completed successfully without obstacles? Yes

3. Interface and Feedback
   • Was the interface feedback timely and useful? Yes
   • Can the user obtain sufficient information from the interface to know if their actions are correct? Yes

   • Does the system provide clear guidance where necessary? Yes
   • Does the user clearly know when the task is completed? Yes

4. Expectations vs Reality
   • Are the user's expectations of the task and the actual operations aligned? Yes
   • Does the interface design match the user's thinking patterns? Yes

5. Factors for Task Success
   • What design elements helped the user complete the task? Clear buttons and interface layout
   • What design elements may have hindered the task completion? None

6. Summary and Recommendations
   • Overall assessment: Was the task easy and smooth to perform? Yes
   • Improvement suggestions based on the evaluation results.

Lack of guidance. Page layouts are lack of organization.

Figure A.9: *CW response to the prototype made by Yixuan ZHOU*

Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   • Task Goal: Event Display and RSVP

2. Evaluation Questions
   • Can the user locate and perform the necessary actions to complete the task? YES

   • Are the interface elements clear and easy to understand? YES

   • Did the user encounter any difficulties while performing the task?

   Yes, there lacks guidance and mention.
   • Was the task completed successfully without obstacles? No, the user doesn't know how to do without guidance.

3. Interface and Feedback
   • Was the interface feedback timely and useful? Yes
   • Can the user obtain sufficient information from the interface to know if their actions are correct? Yes, enough feedback.

   • Does the system provide clear guidance where necessary? No, just relevant picture guidance.
   • Does the user clearly know when the task is completed? Yes, enough feedback.

4. Expectations vs Reality
   • Are the user's expectations of the task and the actual operations aligned? Yes
   • Does the interface design match the user's thinking patterns? Yes
5. Factors for Task Success
   • What design elements helped the user complete the task?

Clear buttons and interface layout and feedback windows.
   • What design elements may have hindered the task completion? None
6. Summary and Recommendations
   • Overall assessment: Was the task easy and smooth to perform? Yes
   • Improvement suggestions based on the evaluation results. The prototype meet all CW requirements. However, many lack of guidance and feedback pages, overall completion is good.

Figure A.10: *CW response to the prototype made by Yuyang ZHANG*

Cognitive Walkthrough (CW) Evaluation Table

Evaluation Content and Questions

1. Task Description
   • Task Goal: Event Display and RSVP

2. Evaluation Questions
   • Can the user locate and perform the necessary actions to complete the task? Based on the buttons and options, users can find the desired actions
   • Are the interface elements clear and easy to understand? Buttons, icons, etc. are in line with user intuition, and text descriptions can also help users understand each operation well.
   • Did the user encounter any difficulties while performing the task? No
   • Was the task completed successfully without obstacles? Yes

3. Interface and Feedback
   • Was the interface feedback timely and useful? Yes
   • Can the user obtain sufficient information from the interface to know if their actions are correct? Yes.There will be prompts on each interface
   • Does the system provide clear guidance where necessary? Yes
   • Does the user clearly know when the task is completed? Yes

4. Expectations vs Reality
   • Are the user's expectations of the task and the actual operations aligned? Yes
   • Does the interface design match the user's thinking patterns? Yes

5. Factors for Task Success
   • What design elements helped the user complete the task? Clear buttons, intuitive interface and text descriptions
   • What design elements may have hindered the task completion? None

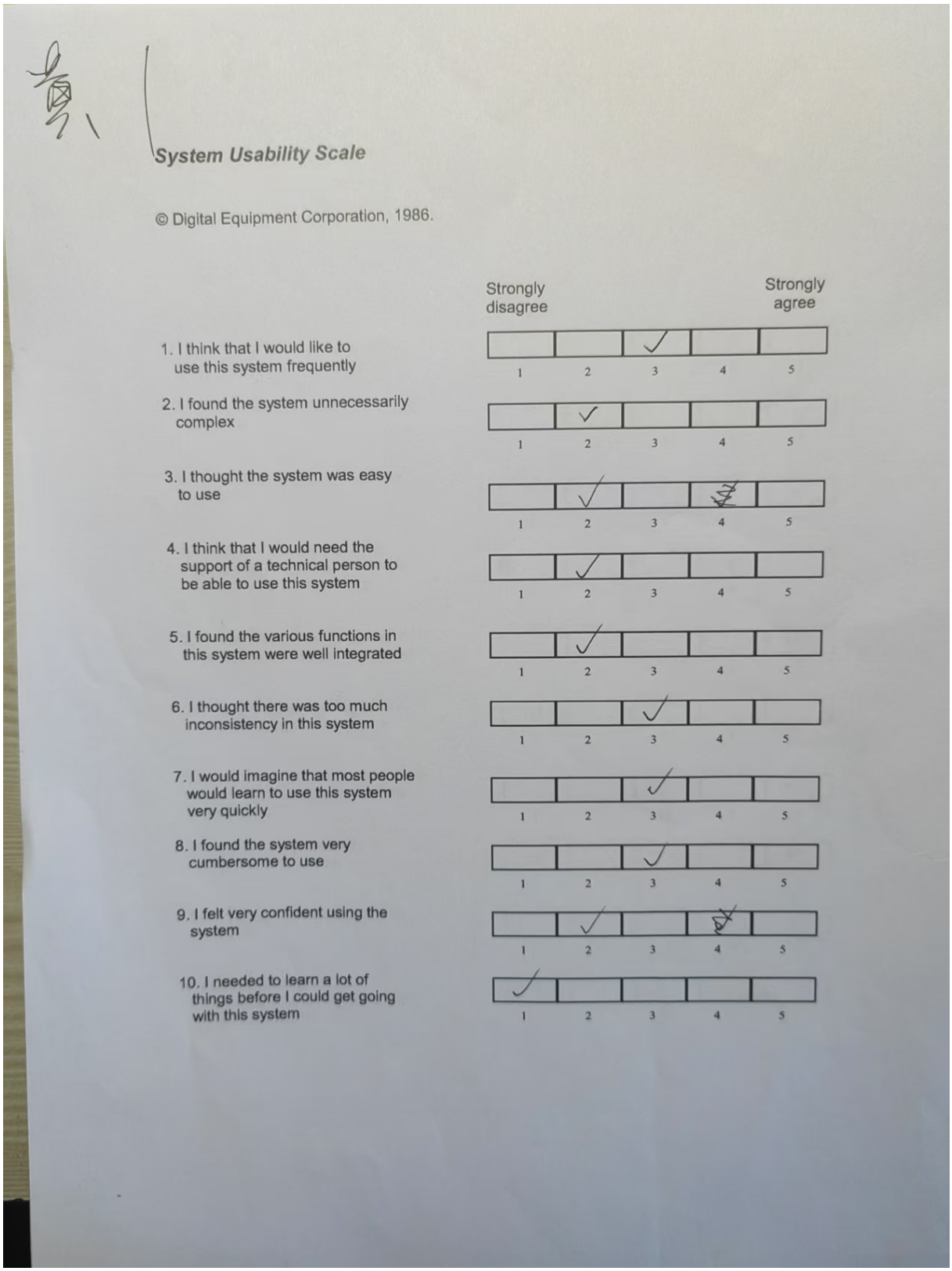
6. Summary and Recommendations
   • Overall assessment: Was the task easy and smooth to perform? Yes
   • Improvement suggestions based on the evaluation results.

The prototype passed all CW questions, none suggestion.

Figure A.11: *CW response to the prototype made by Zelin XIA*

A.4 SUS responses

The SUS response forms in figure A.12, figure A.13, figure A.14, figure A.15, figure A.16, figure A.17, figure A.18 and figure A.19 are manually filled out by the participants. We will later enter the SUS responses into a website to calculate the scores, which will then be presented in figure 3.1.



System Usability Scale

© Digital Equipment Corporation, 1986.

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	✓ 3	4	5
2. I found the system unnecessarily complex	1	✓ 2	3	4	5
3. I thought the system was easy to use	1	✓ 2	3	✓ 4	5
4. I think that I would need the support of a technical person to be able to use this system	1	✓ 2	3	4	5
5. I found the various functions in this system were well integrated	1	✓ 2	3	4	5
6. I thought there was too much inconsistency in this system	1	2	✓ 3	4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	✓ 3	4	5
8. I found the system very cumbersome to use	1	2	✓ 3	4	5
9. I felt very confident using the system	1	✓ 2	3	✓ 4	5
10. I needed to learn a lot of things before I could get going with this system	✓ 1	2	3	4	5

Figure A.12: *SUS Reponse Form 1(52.5 points)*

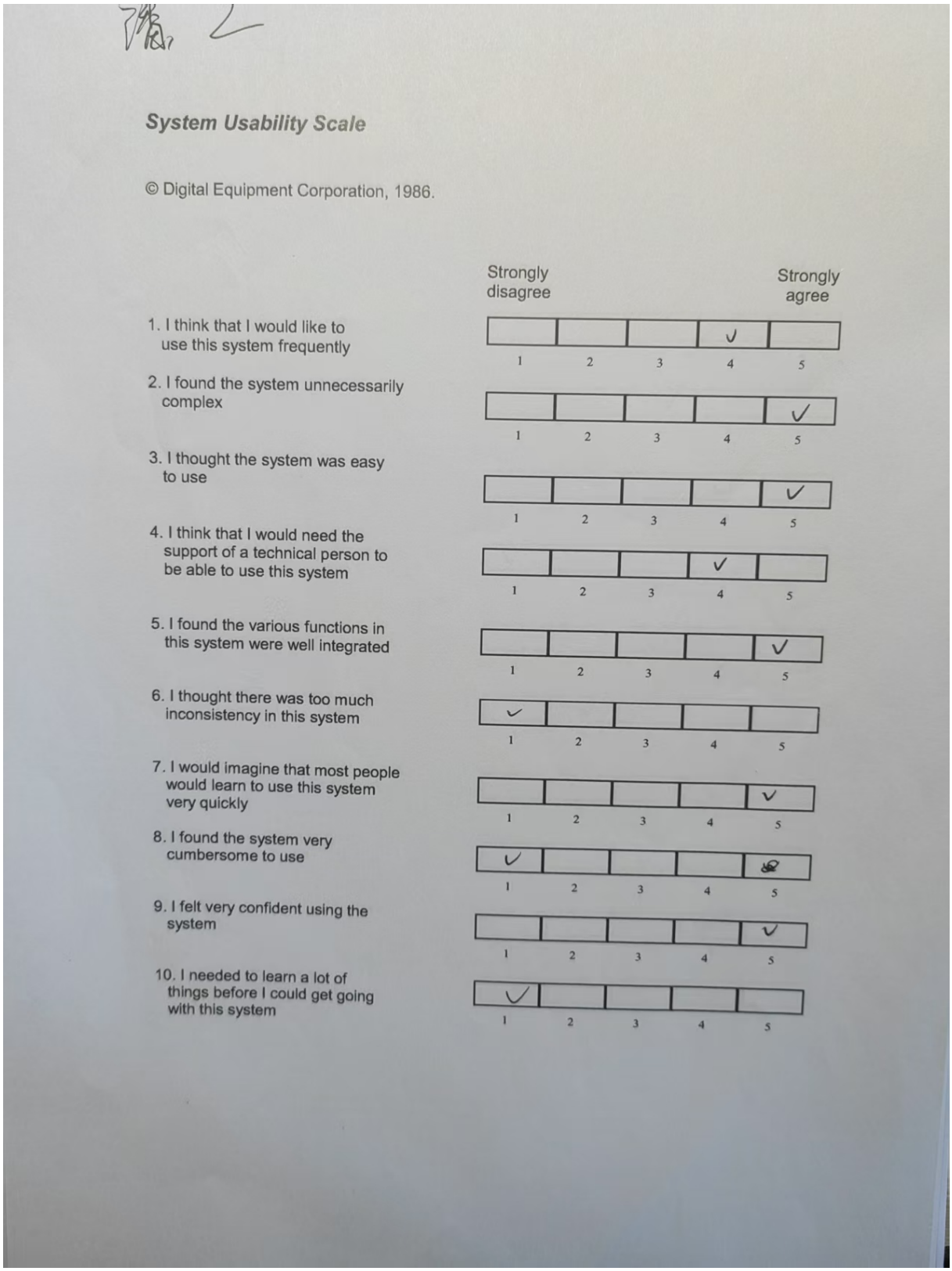


Figure A.13: *SUS Response Form 2(80 points)*

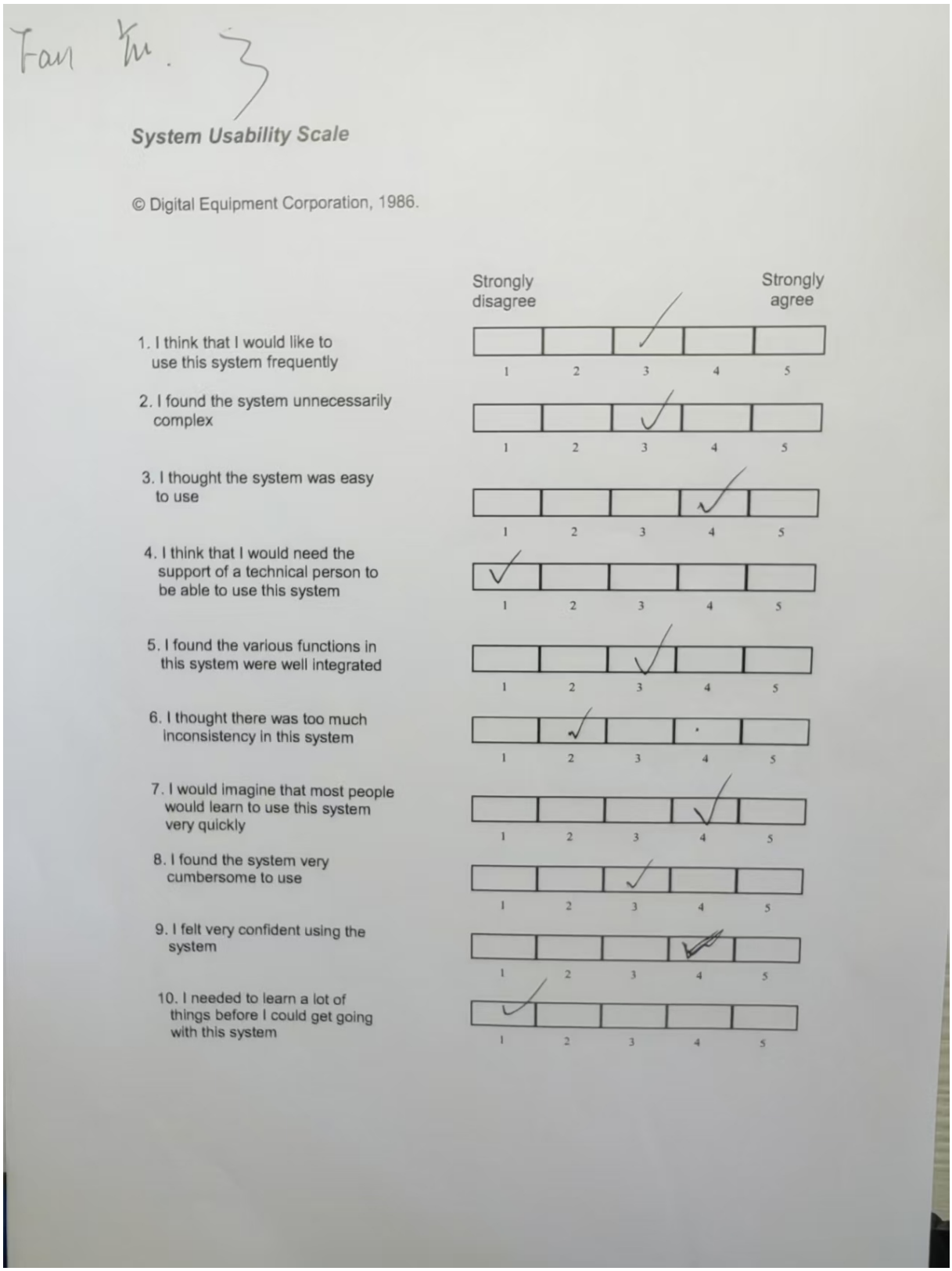
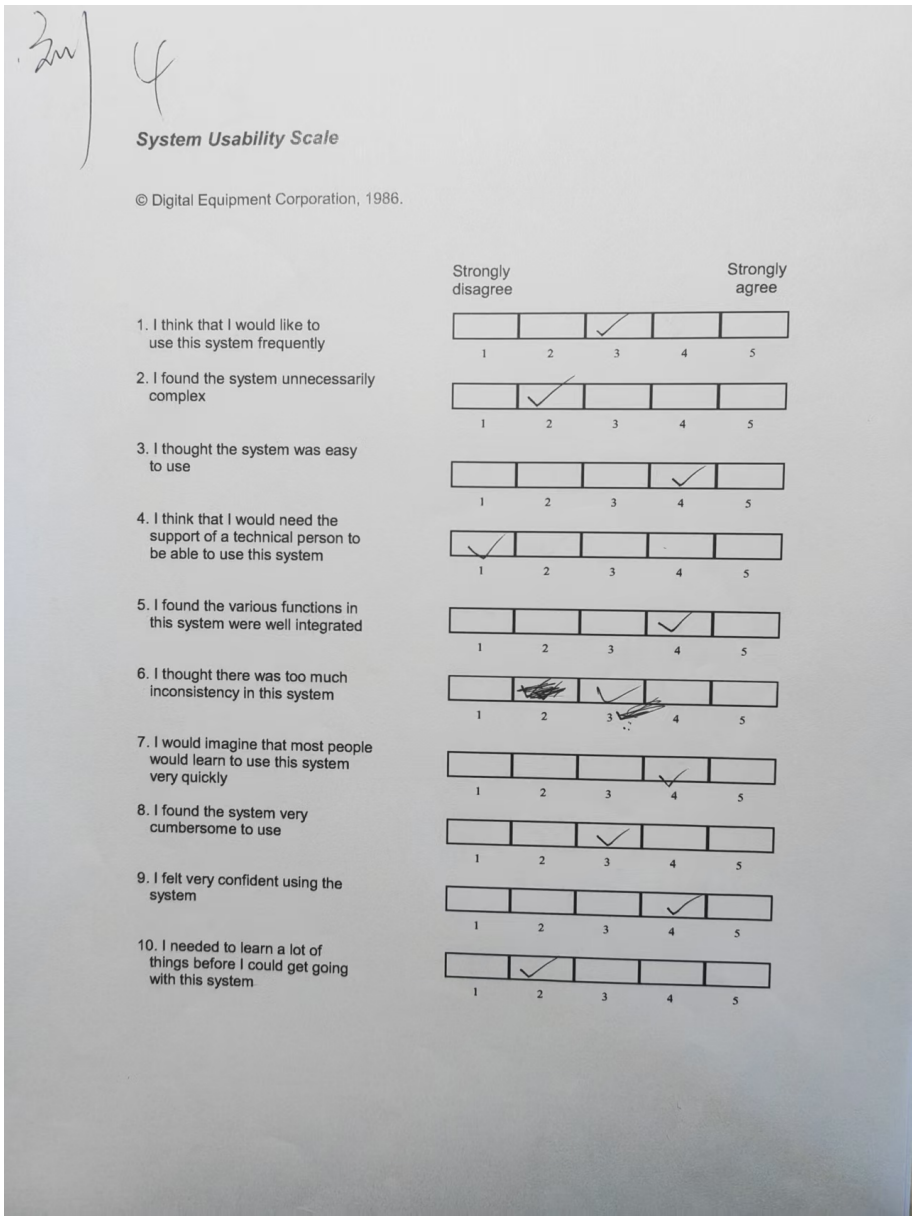


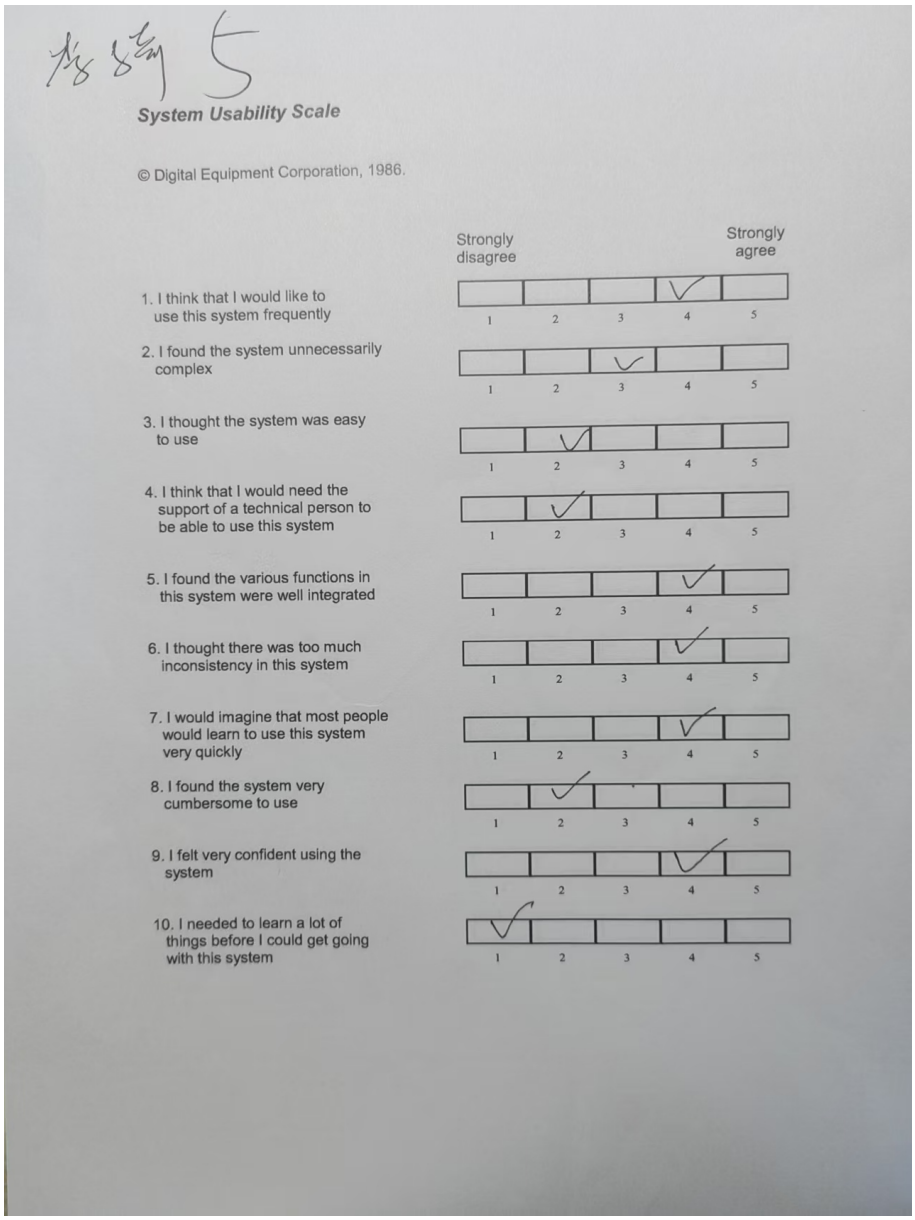
Figure A.14: *SUS Response Form 3(70 points)*



System Usability Scale

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	✓ 3	4	5
2. I found the system unnecessarily complex	1	✓ 2	3	4	5
3. I thought the system was easy to use	1	2	3	✓ 4	5
4. I think that I would need the support of a technical person to be able to use this system	✓ 1	2	3	4	5
5. I found the various functions in this system were well integrated	1	2	3	✓ 4	5
6. I thought there was too much inconsistency in this system	1	✓ 2	✓ 3	4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	3	✓ 4	5
8. I found the system very cumbersome to use	1	2	✓ 3	4	5
9. I felt very confident using the system	1	2	3	✓ 4	5
10. I needed to learn a lot of things before I could get going with this system	1	✓ 2	3	4	5

Figure A.15: *SUS Response Form 4(70 points)*

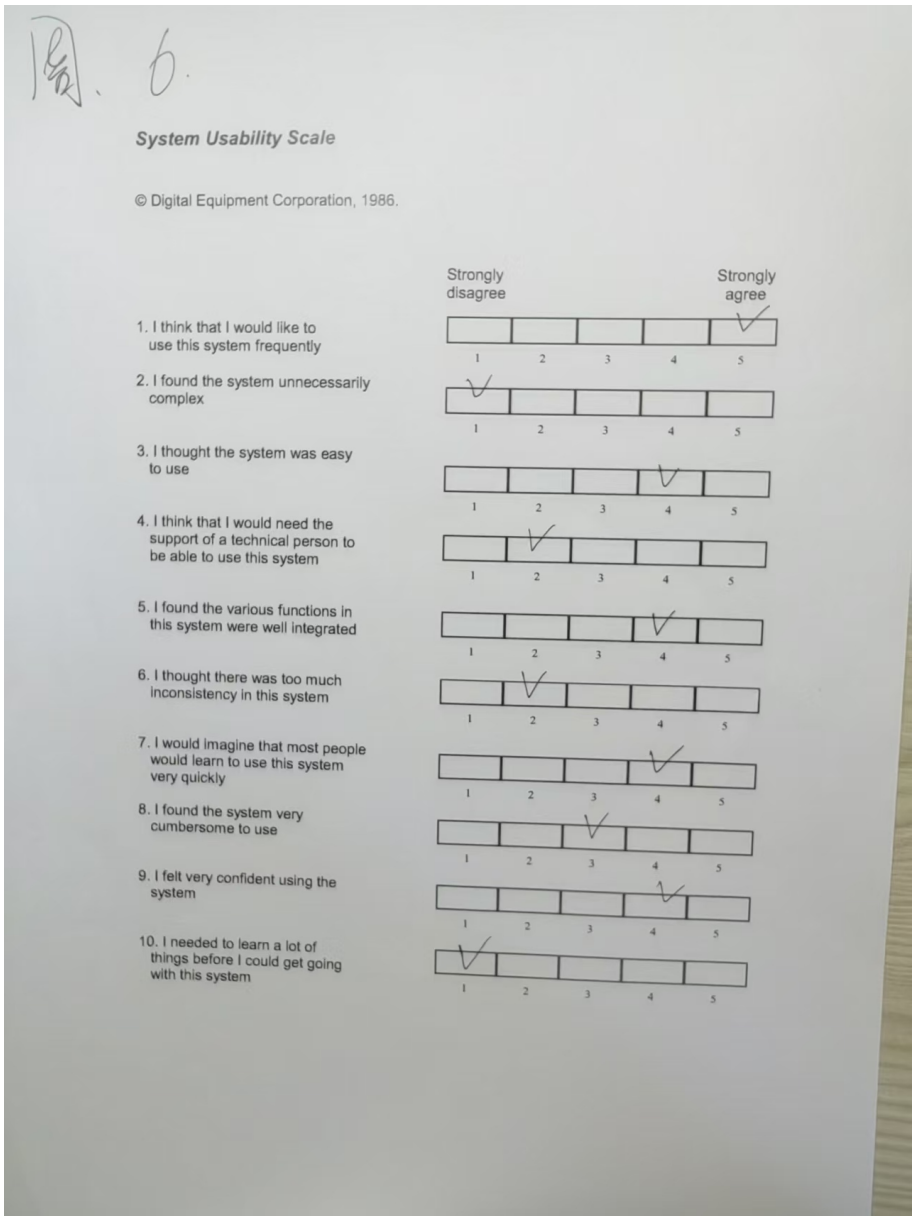


System Usability Scale

© Digital Equipment Corporation, 1986.

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	3	✓ 4	5
2. I found the system unnecessarily complex	1	2	✓ 3	4	5
3. I thought the system was easy to use	1	✓ 2	3	4	5
4. I think that I would need the support of a technical person to be able to use this system	1	✓ 2	3	4	5
5. I found the various functions in this system were well integrated	1	2	3	✓ 4	5
6. I thought there was too much inconsistency in this system	1	2	3	✓ 4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	3	✓ 4	5
8. I found the system very cumbersome to use	1	✓ 2	3	4	5
9. I felt very confident using the system	1	2	3	✓ 4	5
10. I needed to learn a lot of things before I could get going with this system	✓ 1	2	3	4	5

Figure A.16: *SUS Response Form 5(65 points)*



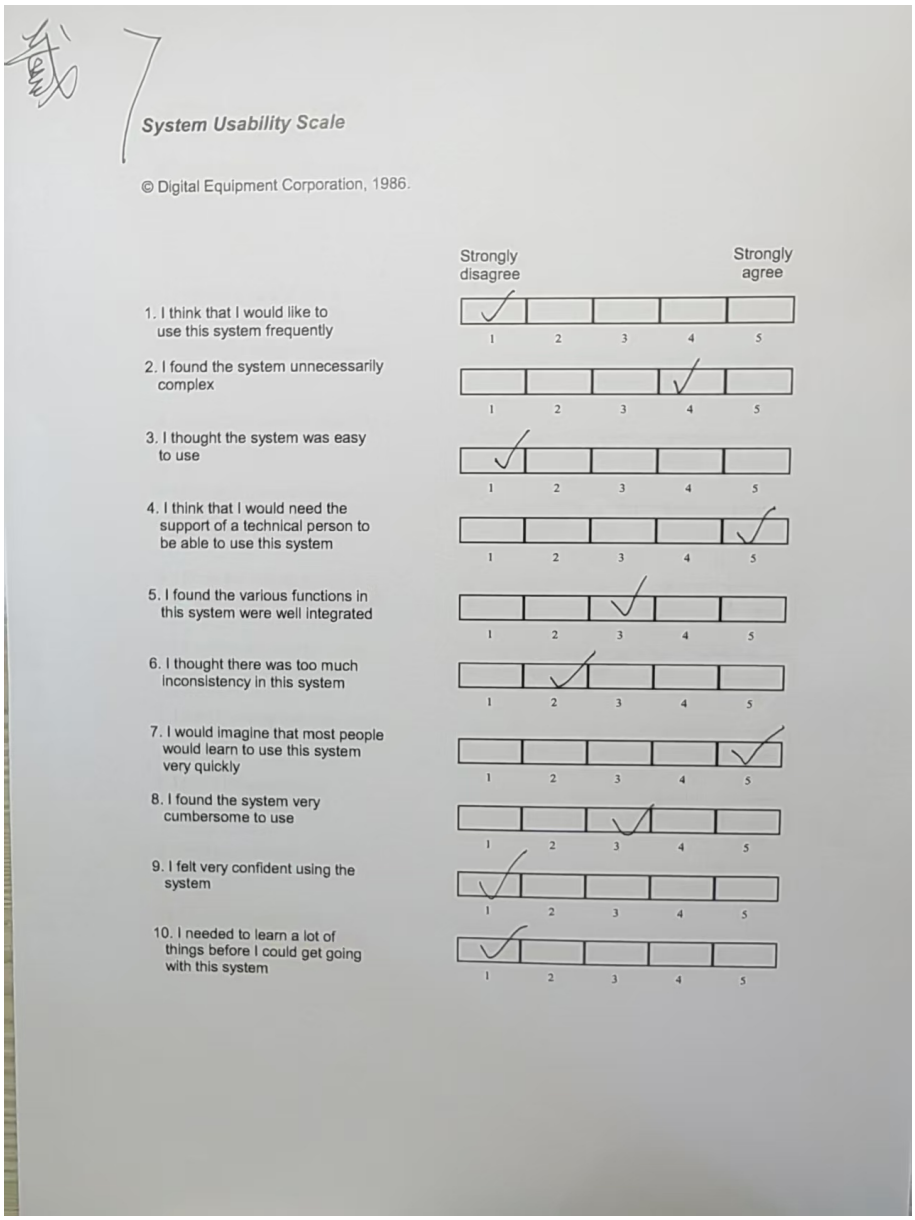
6.

System Usability Scale

© Digital Equipment Corporation, 1986.

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	3	4	✓ 5
2. I found the system unnecessarily complex	✓ 1	2	3	4	5
3. I thought the system was easy to use	1	2	3	✓ 4	5
4. I think that I would need the support of a technical person to be able to use this system	1	✓ 2	3	4	5
5. I found the various functions in this system were well integrated	1	2	3	✓ 4	5
6. I thought there was too much inconsistency in this system	1	✓ 2	3	4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	3	✓ 4	5
8. I found the system very cumbersome to use	1	2	✓ 3	4	5
9. I felt very confident using the system	1	2	3	✓ 4	5
10. I needed to learn a lot of things before I could get going with this system	✓ 1	2	3	4	5

Figure A.17: *SUS Response Form 6(80 points)*



System Usability Scale

© Digital Equipment Corporation, 1986.

	Strongly disagree				Strongly agree
1. I think that I would like to use this system frequently	1	2	3	4	5
2. I found the system unnecessarily complex	1	2	3	4	5
3. I thought the system was easy to use	1	2	3	4	5
4. I think that I would need the support of a technical person to be able to use this system	1	2	3	4	5
5. I found the various functions in this system were well integrated	1	2	3	4	5
6. I thought there was too much inconsistency in this system	1	2	3	4	5
7. I would imagine that most people would learn to use this system very quickly	1	2	3	4	5
8. I found the system very cumbersome to use	1	2	3	4	5
9. I felt very confident using the system	1	2	3	4	5
10. I needed to learn a lot of things before I could get going with this system	1	2	3	4	5

Figure A.18: *SUS Response Form 7(40 points)*

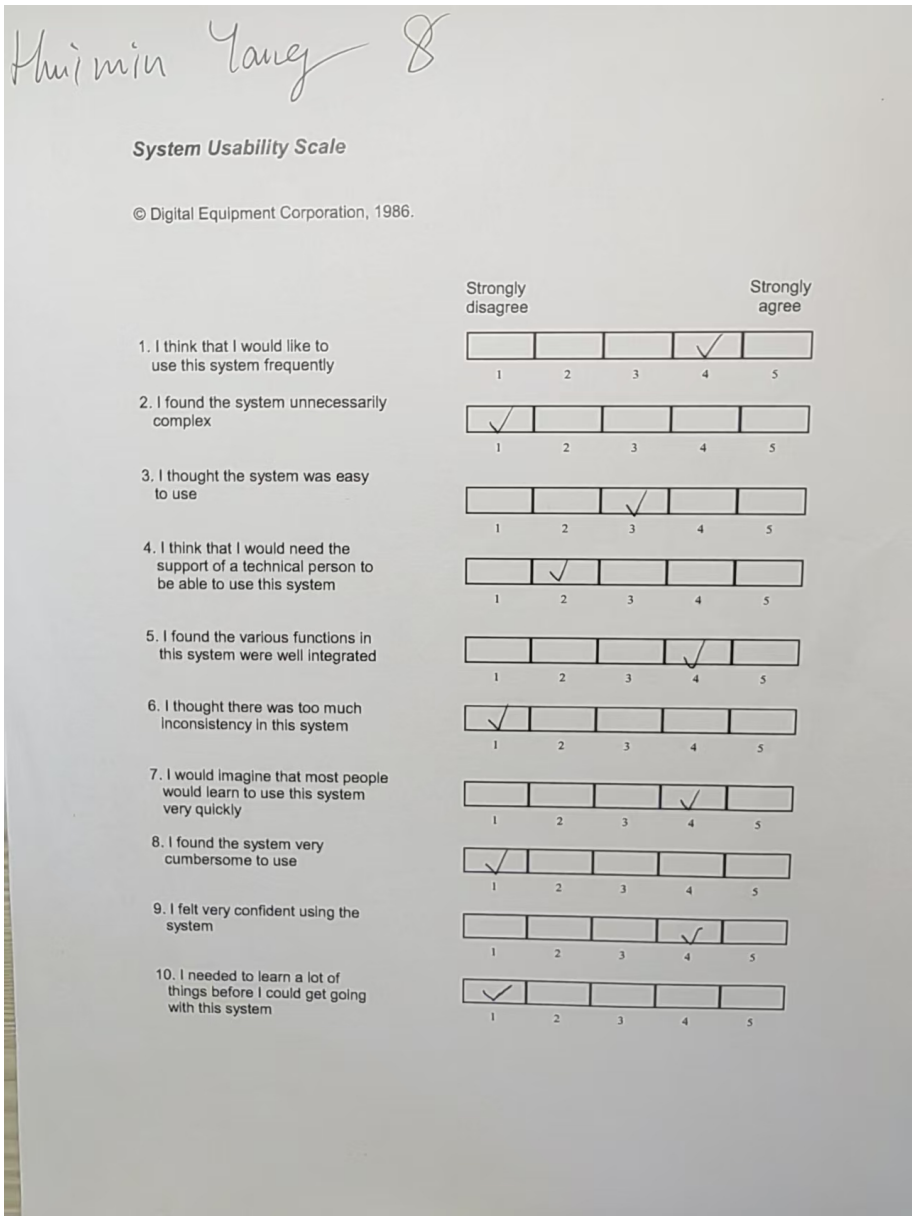


Figure A.19: *SUS Response Form 8(82.5 points)*

A.5 Evidence of Informed Consent from Participants

The participant consent forms in figure A.20, figure A.21, figure A.22, figure A.23, figure A.24, figure A.25, figure A.26 and figure A.27 are manually filled out by the participants and researchers.

CONSENT FORM

University of Nottingham
UK | CHINA | MALAYSIA

Project: COMP2044 Coursework 2, UNNC Event Discovery and RSVP APP

The usability study for the UNNC Event Discovery and RSVP mobile application aims to evaluate a prototype system designed specifically for UNNC events. During the study, we will be assessing the usability of the mobile application and gathering feedback from users to help improve its functionality and overall user experience.

You will be asked to perform a few short, information-gathering tasks using the prototype whilst being observed by the researcher. This will take no longer than 15 minutes. After the task there will be a short interview about your experience.

I understand that I can withdraw at any time by contacting the researcher using the details provided below, and my personal data will be erased from the records.

I confirm that I am over the age of 18.

This is to confirm that I have agreed to take part in a research trial on the date:

21 April 2025

Signed 黄鑫伟

Name ...Xinwei Huang.....

Researcher Name ..Wei Yingcong.....

Email address ...scyyw18@nottingham.edu.cn.....

I do NOT wish to be recorded using audio and/or video ☐

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. ☑

Signed 黄鑫伟

Figure A.20: *Participant Consent Form 1*

2

CONSENT FORM

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Project: COMP2044 Coursework 2, UNNC Event Discovery and RSVP APP

The usability study for the UNNC Event Discovery and RSVP mobile application aims to evaluate a prototype system designed specifically for UNNC events. During the study, we will be assessing the usability of the mobile application and gathering feedback from users to help improve its functionality and overall user experience.

You will be asked to perform a few short, information-gathering tasks using the prototype whilst being observed by the researcher. This will take no longer than 15 minutes. After the task there will be a short interview about your experience.

I understand that I can withdraw at any time by contacting the researcher using the details provided below, and my personal data will be erased from the records.

I confirm that I am over the age of 18.

This is to confirm that I have agreed to take part in a research trial on the date:

4 April 2025

Signed .....潘乐涠.....
Name .....Letian Pan.....

Researcher Name ...Wei Yingcong.....
Email address ....scyyw18@nottingham.edu.cn.....

I do NOT wish to be recorded using audio and/or video □

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. □

Signed .....潘乐涠.....

Figure A.21: *Participant Consent Form 2*

CONSENT FORM

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Project: COMP2044 Coursework 2, UNNC Event Discovery and RSVP APP

The usability study for the UNNC Event Discovery and RSVP mobile application aims to evaluate a prototype system designed specifically for UNNC events. During the study, we will be assessing the usability of the mobile application and gathering feedback from users to help improve its functionality and overall user experience.

You will be asked to perform a few short, information-gathering tasks using the prototype whilst being observed by the researcher. This will take no longer than 15 minutes. After the task there will be a short interview about your experience.

I understand that I can withdraw at any time by contacting the researcher using the details provided below, and my personal data will be erased from the records.

I confirm that I am over the age of 18.

This is to confirm that I have agreed to take part in a research trial on the date:

21..April 2025

Signed .....
Name .....Fan...Yu.....

Researcher Name ..Wei....Yingcong.....
Email address ..sypw8@nottingham.edu.cn.....

I do NOT wish to be recorded using audio and/or video ☐

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. ☑

Signed .....

Figure A.22: *Participant Consent Form 3*

4

CONSENT FORM

University of Nottingham
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Project: COMP2044 Coursework 2, UNNC Event Discovery and RSVP APP

The usability study for the UNNC Event Discovery and RSVP mobile application aims to evaluate a prototype system designed specifically for UNNC events. During the study, we will be assessing the usability of the mobile application and gathering feedback from users to help improve its functionality and overall user experience.

You will be asked to perform a few short, information-gathering tasks using the prototype whilst being observed by the researcher. This will take no longer than 15 minutes. After the task there will be a short interview about your experience.

I understand that I can withdraw at any time by contacting the researcher using the details provided below, and my personal data will be erased from the records.

I confirm that I am over the age of 18.

This is to confirm that I have agreed to take part in a research trial on the date:

21 April 2025

Signed ....Yinghao Liu.....
Name .....刘英豪.....

Researcher Name .Yinglong....Wei.....
Email address .scyyw18@nottingham.edu.cn.....

I do NOT wish to be recorded using audio and/or video ☐

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. ☑

Signed ....刘英豪.....

Figure A.23: *Participant Consent Form 4*

CONSENT FORM

University of Nottingham
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Project: COMP2044 Coursework 2, UNNC Event Discovery and RSVP APP

The usability study for the UNNC Event Discovery and RSVP mobile application aims to evaluate a prototype system designed specifically for UNNC events. During the study, we will be assessing the usability of the mobile application and gathering feedback from users to help improve its functionality and overall user experience.

You will be asked to perform a few short, information-gathering tasks using the prototype whilst being observed by the researcher. This will take no longer than 15 minutes. After the task there will be a short interview about your experience.

I understand that I can withdraw at any time by contacting the researcher using the details provided below, and my personal data will be erased from the records.

I confirm that I am over the age of 18.

This is to confirm that I have agreed to take part in a research trial on the date:

21 April 2023

Signed 李子甸

Name Zidian Li

Researcher Name zelin XIA

Email address scyzx4@nottingham.edu.cn

I do NOT wish to be recorded using audio and/or video ☐

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. ☐

Signed 李子甸

Figure A.24: *Participant Consent Form 5*

CONSENT FORM

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Project: COMP2044 Coursework 2, UNNC Event Discovery and RSVP APP

The usability study for the UNNC Event Discovery and RSVP mobile application aims to evaluate a prototype system designed specifically for UNNC events. During the study, we will be assessing the usability of the mobile application and gathering feedback from users to help improve its functionality and overall user experience.

You will be asked to perform a few short, information-gathering tasks using the prototype whilst being observed by the researcher. This will take no longer than 15 minutes. After the task there will be a short interview about your experience.

I understand that I can withdraw at any time by contacting the researcher using the details provided below, and my personal data will be erased from the records.

I confirm that I am over the age of 18.

This is to confirm that I have agreed to take part in a research trial on the date:

21 April 2025

Signed 周梓涵

Name Zihan Zhou

Researcher Name Wei Yingrong

Email address scy2215@nottingham.edu.cn

I do NOT wish to be recorded using audio and/or video ☒

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. ☐

Signed 周梓涵

Figure A.25: *Participant Consent Form 6*

CONSENT FORM

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This is to confirm that I have agreed to take part in a research trial on the date:

21 April 2025

Signed .....
Name .....

Researcher Name ..... Zelin XIA .....
Email address ..... sayzxs@nottingham.edu.cn

I do NOT wish to be recorded using audio and/or video □

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. □

Signed .....

Figure A.26: *Participant Consent Form 7*

CONSENT FORM

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I understand that I can withdraw at any time by contacting the researcher using the details provided below, and my personal data will be erased from the records.

I confirm that I am over the age of 18.

This is to confirm that I have agreed to take part in a research trial on the date:

21... April 2025

Signed .....Huimin Tang.....
Name .....Huimin Tang.....

Researcher Name .....Zelin XIA.....
Email address .....scyzxs@nottingham.edu.cn

I do NOT wish to be recorded using audio and/or video ☐

In addition to the data analysis, I give permission for data that could identify me (e.g. photos, video) to be published in the coursework report. ☑

Signed ....Huimin Tang.....

Figure A.27: *Participant Consent Form 8*

A.6 Improvements

This section contains the areas where we found the prototype needed modification.

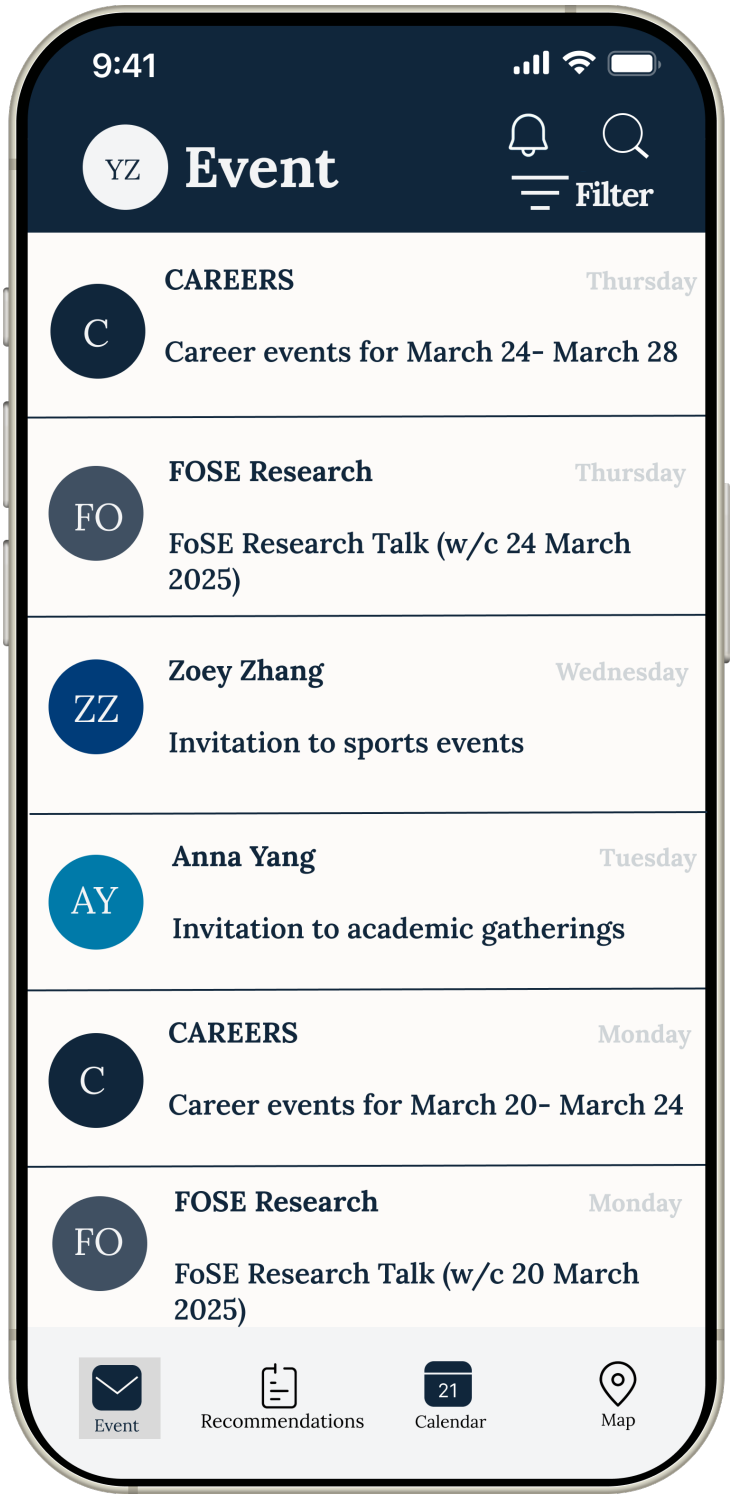

Figure A.28: *The Menu interface needs to be modified to clearly indicate that you can enter the personal page by clicking the name icon in the upper left corner.*

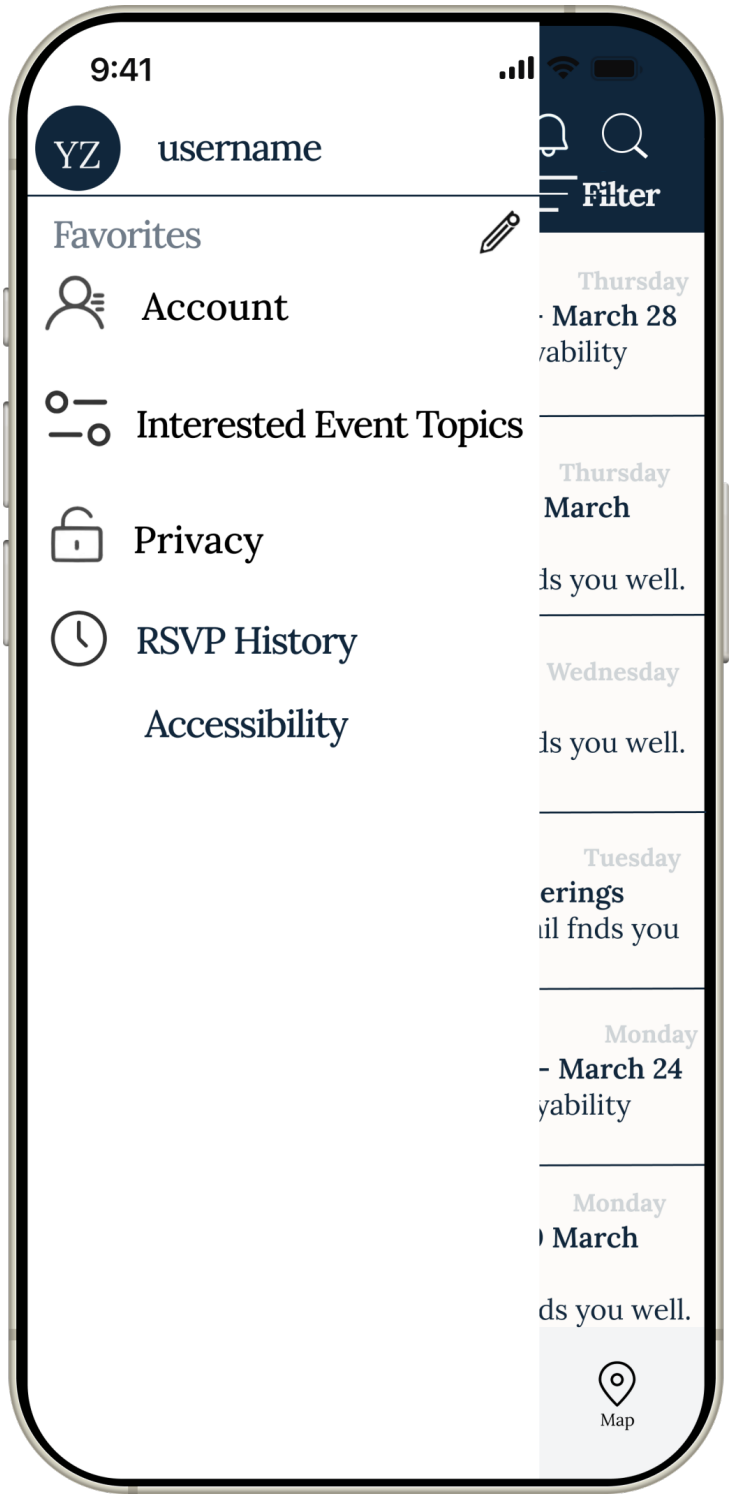

Figure A.29: *The privacy interface needs to be modified to clearly indicate that the reminder setting is in the privacy interface.*

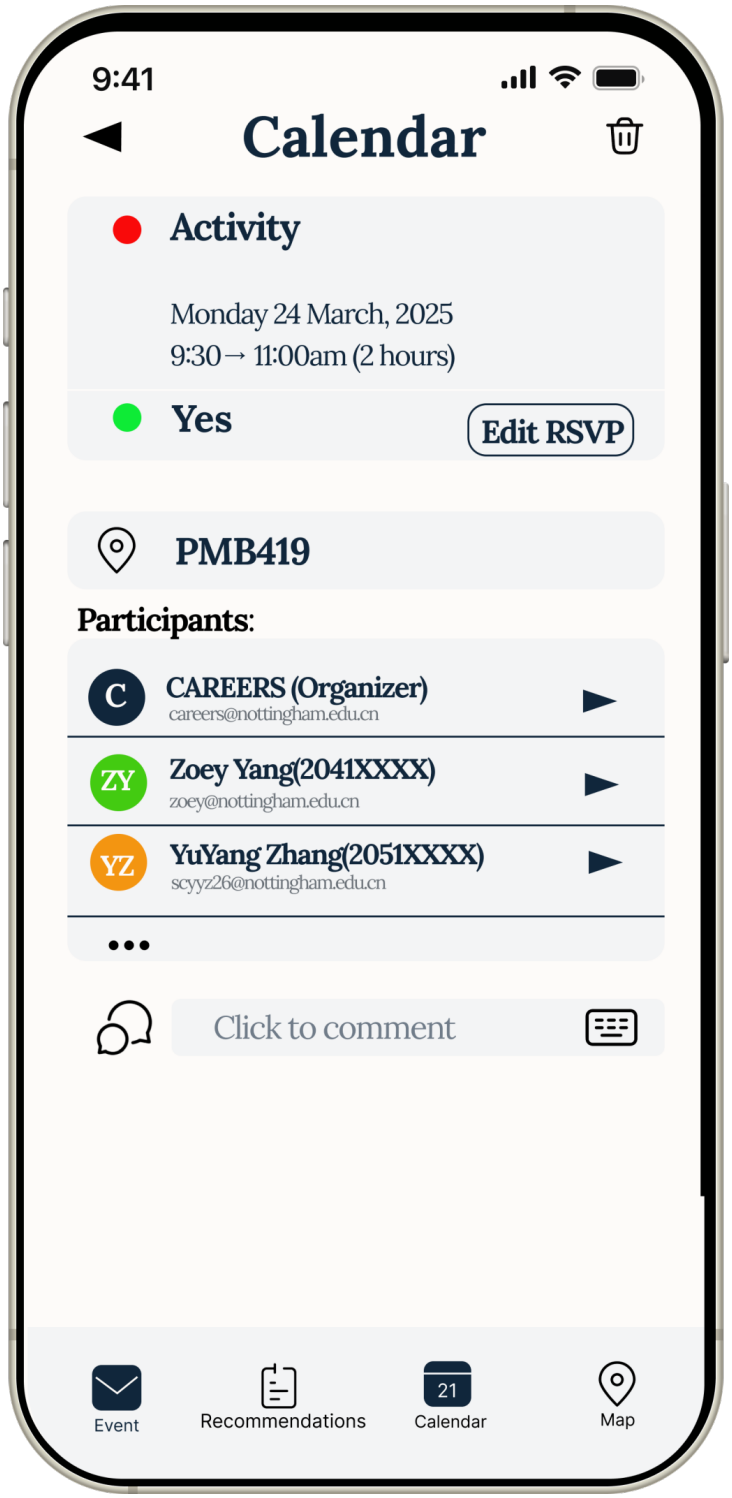

Figure A.30: *The Edit RSVP interface lacks guidance, causing users to hesitate*

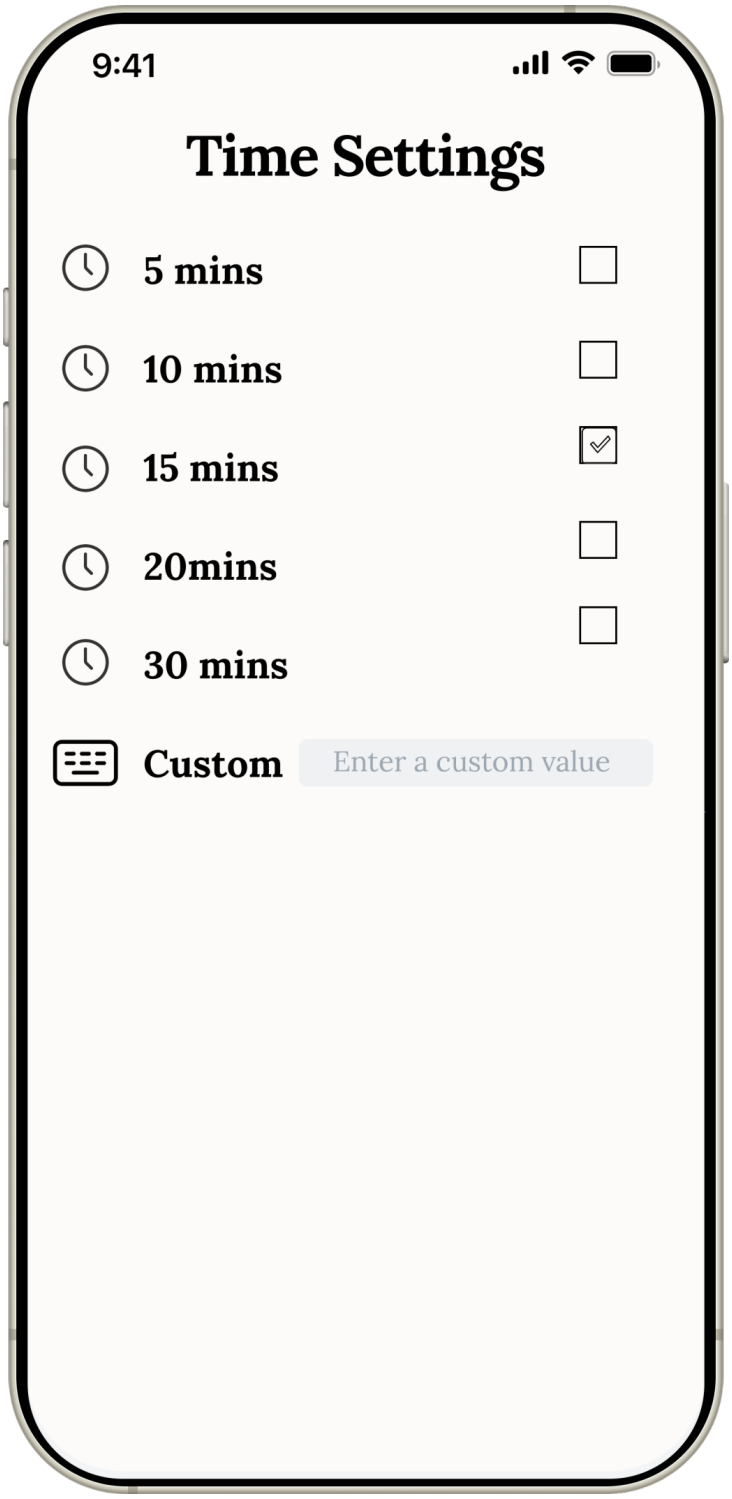

Figure A.31: *The reminder interface is blurry and it is impossible to determine whether the modification is successful.*