Overview

The content of this part is to check whether the prototype of the improved application conforms to the concept of human-computer interaction. In each evaluation, we invited above 13 out of class anonymous testers. These experts can use the principle of interaction to better help us find the good and bad qualities of the design and determine whether it has problems.

The evaluation methods we used include:

- Technology Acceptance Model (TAM)
- Pre-designed tasks and interviews

Evaluation process

The evaluation process of the prototype will be carried out according to the protocol in the evaluation approaches. We will explain our improved protocol to users and introduce the evaluation process to ensure that the evaluation of each participant is consistent. The invited testers will give different types of feedback for different evaluation methods. These feedback results will be used for analysis and discussion, but will not be displayed in this prototype. Finally, we will sort out basic conclusions and possible solutions based on the results of the analysis.

TAM

1. Background of TAM

The Technology Acceptance Model (TAM) aims to measure the adoption of new technologies based on the attitudes of users(Allen, 2020). Users' attitudes towards new technologies are mainly divided into four categories, namely, perceived usefulness (PU), perceived ease-of-use (PEOU), attitude towards technology (ATT) and intention to use (ITO). Perceived usefulness is a measure of the degree to which users find a particular system useful when working with it. Perceived ease-of-use is a measure of whether users think it is easy for them to use a particular system. Attitude towards technology is a measurement method based on perceived usefulness and perceived ease of use. It mainly detects users' attitudes towards new technologies, that is, whether they accept the technology. Finally, the intention to use is based on all the above directions to measure the possibility of users using this technology in the future.

2. Evaluation process of TAM

Before starting the evaluation, we introduced the operation process of TAM and the concept of our application to the users and allowed them to simply operate the prototype we provided them before filling out the questionnaire. The user's operation should not be too complicated. After that, users will complete the questionnaire. The scores given by users will be integrated and analyzed at the end.

3. Reasons for using TAM

We chose this evaluation method because the current evaluation stage has reached the med-fidelity prototype evaluation, and all functions and interaction models are basically in a relatively complete state. At this time, testing whether the user can accept such a design concept will more accurately reflect the acceptance of our prototype in the user group and the user's attitude. In addition, the questionnaire model allows us to better analyze those problems.

4. Limitation of TAM
The lack of a consistent process during testing can easily lead to the omission of details, and all users' ratings are based on their ideas, rather than being completely objective and fair. Finally, since TAM only provides quantitative data, more information is needed.

Evaluation

For the evaluation session, a plan is made for collecting data from users' feedback, focusing on both further design advice and future changes. According to the app's goals on features and the purpose, the selected evaluation methods will be TAM, cognitive walkthrough which will work with the TAM form, observations, and follow-up questions for generating various types of data to keep both quality and quantity. Observations will be regarded as one of the types of feedback after completing pre-design tasks which were related to users' interactions and check whether users can complete the whole process and know the goals/ purpose of the app or not.

At the same time, TAM will be conducted with specified survey forms. All results will be collected and visualized with forms and average marks which may provide a straightforward data visualization for analyzing to show the advantages and disadvantages of both UI designs like layouts and features with yes or no questions. TAM will be used to cover the first level of feedback which were aiming to point out the simplest views on "good or bad" opinions and will be selected as one of the evaluation methods to collect data from many aspects based on individuals' behaviour intention and attitudes. The differences between individuals will be connected with many aspects to give average marks which are regarded as a tool for analyzing with a multi-dimensional model for the evaluation of users' opinions. However, TAM can hardly tell what exactly the problems are.

To point out problems targeted, walkthrough tasks with follow-up questions and the related observations will be necessary to show users' reactions to their user experience as well as the app's functionality, usability, and accessibility. The follow-up questions will be designed as a semi-structured interview which is a meeting when the interviewer does not follow the formal questionnaire steps strictly or use the direct model of question-and-answer and make a discussion with the interviewees. Before asking questions, the interviewer will have a general understanding of some tasks for already known information and preference which will also be realized through TAM interacting sessions. During the questioning session, according to the question lists, the interviewer will expand some aspects about the theme with open-ended questions which the answers of those are not just simple "YES" or "No". The semi-structured interview makes it easy for double side communication and sharing information about the topic. When evaluating the prototype, the walkthrough process helps the target user to understand the test products better.

The evaluation approaches

Before the evaluation, tasks will be designed first for each interaction to be evaluated. To start the prototype, there will be no provided guideline for users on each task. Users will be asked to experience the prototype before completing tasks. When users are completing tasks, observations will be observed at the same time for users' reactions on interactions which can be regarded as a kind of direct feelings from users. Some interactions may cause

users' reactions like hesitation, confusion and dizziness. So, these interactions can be noticed easily which will be paid more attention to. After completing pre-designed tasks, Some follow up questions will be asked as a semi-structured interview to make sure the aspects of interactions which are needed to be improved. It's always hard to figure out what to be improved on each interaction because there are too many interactions. TAM will help with narrowing interactions' range and finding out where appears problems. On the other hand, TAM is also useful on a statistic that can figure out the number of users that gives positive or negative opinions on specific tasks. The interviews will be used to ask users to get detailed feedback about what and how to improve on those interactions. Finally, surveys and TAM's results, questioning scripts and observations will be analyzed for the possible further improvements on designing iterations.

Reference

[1] R. Allen, "The Technology Acceptance Model | Smart Insights", Smart Insights, 2020. [Online]. Available: https://www.smartinsights.com/manage-digital-transformation/digital-transformation-strategy/digital-marketing-models-technology-acceptance-model/. [Accessed: 25- Sep- 2021].