**User Testing Plan**

1. Three modeling scenarios
   1. **Remade preference system:** This system is a brand new system based on the previously used Google Sheets. Students can choose seven preference items and assign values to them (between 1-7). The collected data is stored in Google Sheets, which can be viewed, edited, and downloaded by the teaching team.

#### **Apportionment Preference System ：**This item is a preference selection management interface that allows the user to search, select and view item details. Users can select a certain number of projects and view a progress bar and list of selected projects after selection. Administrators can download forms and manage project quantity scores.

* 1. **Positive/Negative Preference System**: Preference selection system based on Google Forms implementation. Students will be asked to select items of interest and items of disinterest when selecting their preference items, and this approach will help teams of teachers to spread the selection of student preferences and reduce the likelihood that students will be assigned to items of disinterest.

1. User Testing Goal(s)
   1. What did you expect the participants to say?

User testing collects user feedback on the use of three preference systems through open-ended questions, encouraging users to express their true feelings and thoughts.

* Software functions:Integrity of functionality, effectiveness of functionality, necessity of functionality
* User interface and operation: interface intuitiveness, interface aesthetics, navigation
* User satisfaction: Overall satisfaction, willingness to reuse, willingness to recommend
* User feedback and suggestions: open-ended questions, expected improvements
  1. What did you expect the participants to do while being tested?

1. Honesty and accuracy

Honest answer: Always answer survey questions honestly. The effectiveness of the survey largely depends on the authenticity of the information provided by the participants.

Accuracy: Carefully read each question and answer accurately based on the actual situation. Avoid filling in the data randomly or hastily to avoid affecting its accuracy.

2. Protecting personal privacy

Sensitive information: For issues involving sensitive information, if you are unwilling to share it, you should have the right to refuse to answer without any impact.

3. Follow instructions

Follow the guidelines: Follow all the instructions provided in the questionnaire, including how to choose answers, whether multiple answers can be selected, etc.

Integrity: Unless certain questions are indicated as optional, try to answer all questions as much as possible.

5. Maintain the integrity of the questionnaire

Maintain independence: When filling out the questionnaire, one should think independently and avoid being influenced by others' opinions to ensure the independence and representativeness of the data.

6. Feedback

Provide feedback: If participants feel that there are problems with the questionnaire design or that certain issues are not clear enough, they can provide feedback to the surveyor to help them improve future surveys.

* 1. What amount/type of data were you collecting?
* Quantitative data

1. Grade data: data collected through a scale, satisfaction rating (1 to 5 points), and degree of agreement (ranging from "completely disagree" to "completely agree").
2. Multiple choice question data: the result of multiple or single choice questions

* Qualitative data

1. Answer to open-ended questions: Participants describe a viewpoint in their own words
2. Opinions and suggestions: Suggestions and improvements regarding the product.
3. User/Participant background
   1. **Participant Background:** All participants were students from IFB398/IFB399. A total of eight participants were invited by our group to take the test, and each participant will use the three current systems to make a preference selection and complete feedback for each system.
   2. **Invitation Method:** By personal invitation, our group recruited these eight participants. Each participant had a software engineering knowledge background and was a current qut student. Knowledge of IFB398/IFB399 (taking this course).
   3. **Test Method**: The questionnaires were responded to anonymously to ensure the privacy and security of each participant, while our group hoped that this format would encourage participants to express their views freely.
4. User Test Environment/Setup

* **Organisational approach:** The user testing was organised using online + offline testing, the offline testing took place in the library from 12:30-15:30 p.m. The total duration of this testing was 24 hours, as specified on 15/10/2024.
* **Test conditions**: All participants were asked to complete the entire testing process in a relatively quiet environment to ensure that there were no excessive external factors influencing participants' judgement.
* **Test and Feedback:** participants start the test by clicking into the system via the link shared by the organiser. After completing the full process for all three systems, participants will be asked to complete a feedback scale. The feedback scale is accessed through a link shared by the organiser, and participants are asked to answer the questions within the scale and provide comments on each system, which facilitates a side-by-side comparison for the group.

1. Measurables
   1. Type of data collection
      1. **Collection of personal information:** including user's e-mail address, Student ID (student's id as privacy protection)
      2. **Selection of system usage**: the first part identifies the type of system being used by the respondent through radio buttons. The data is Categorical Data, which is used to understand what type of preference selection system the user is using (positive or negative preference system, reconstructed preference system, or assigned preference system).
      3. **Likert Scale**: A Likert scale was used in Sections 2 through 4 to collect user satisfaction with different aspects of the system, including interface layout, ease of use, and interface interaction. Respondents chose a scale from “very dissatisfied” to “very satisfied” to indicate their opinion of each aspect.Likert scales are commonly used to measure the subjective feelings of users and quantify these feelings into numerical data that can be analyzed.
      4. **Multiple choice questions on reasons for dissatisfaction**: In the sections on interface interactions and overall reasons for dissatisfaction with the system, the questionnaire allowed users to select specific reasons for their dissatisfaction through multiple choice boxes. This data is also categorical, allowing the researcher to summarize and categorize the problems encountered by users, thus providing a basis for further improvement.
      5. **Data retention**: this section collects feedback from users via radio buttons on whether the system is effective in retaining their progress and choices. This type of data is Ordinal Categorical Data, as the answers are in the order of “never successfully saved” to “always saved”.
      6. **Open-ended questions**: The last question is open-ended and asks the user to provide suggestions for allocation methods. This data is Qualitative Data and is used to collect detailed user comments and suggestions for improvement.
   2. Data usage

**System type usage data**:

* Show how often each system type is used with a **pie chart** or **bar graph** generated by Google Forms. This will help to quickly understand which preferred system is more popular among users.

**Likert scale satisfaction data**:

* Use the **averages and bar charts** automatically generated by Google Forms to view the distribution of user satisfaction with the interface layout, difficulty of operation, and interaction. Focus on lower rated items to identify areas for improvement.

**Multiple choice data on reasons for dissatisfaction**:

* Multiple choice results can be displayed in a Google Forms **response summary chart** (e.g., bar graph) that analyzes the reasons for the high number of choices. This can help pinpoint the main issues affecting the user experience.

**Data retention**:

* Google Forms will automatically generate the distribution of choices for each option, and a **pie chart** or **bar graph** can be used to quickly see user feedback on the save feature and determine if there are any save feature issues with the system.

**Analysis of open-ended questions**:

* Google Forms allows exporting text data of open-ended questions. Through keyword analysis or categorization, identify common problems in common suggestions and user feedback to guide further optimization of the system.

1. User Testing Method

#### **Instructions for Participation**

* When participants took the test, I began by giving them a brief description of the background and purpose of the test. For example, “Thank you for participating in this test. We will be evaluating three project selection systems with the goal of understanding how they perform in terms of user experience, operational difficulty, and interface interaction. Your feedback will help us further optimize these systems to better meet user needs. The entire test takes about 20 minutes."
* Before starting, participants will receive a short document or note describing the flow of the test and how it will be scored and feedback will be given: “You will experience each system one by one, completing some simple item selection tasks. At the end of each system experience, you will be asked to rate its interface design, difficulty of operation, etc., and make suggestions for improvement."

#### **2. Testing process**

Participants will experience the three systems in turn and complete the following steps:

#### **Remade Preference System Testing Process:**

* **Step 1**: Participants go to the page and see an item selection form in the form of a matrix, where each row represents an item and each column represents a scoring (1-7).
* **Step 2**: They are asked to select 7 out of approximately 40 items and score each item.
* **Step 3**: After completing their selection and scoring, participants clicked Submit and the system would save their selections.
* **Step 4**: After completing their selections, participants were directed to fill out a short questionnaire rating the system's **interface design** (clarity, visualization), **operational difficulty** (guidance, ease of use), and **interface interactions** (fun, speed of feedback), and providing suggestions for improvement.

##### **Positive & Negative System Testing Procedure:**

* **Step 1**: Participants went to a new page and saw boxes for introductory instructions and preference item selection.
* **Step 2**: Participants were asked to select 4-10 items from the item list that they preferred to like and 4-10 items that they did not want to select.
* **Step 3**: Participants are free to adjust the value of the pulley to visually see the scores change in real time. The scores for each item are displayed dynamically for them to compare.
* **Step 4**: After completing the score adjustment, click Submit and the system saves their choices and scores.
* **Step 5**: They fill out the questionnaire again, scoring the system for **interface design**, **operation difficulty** and **interface interaction**, and giving feedback on the experience of using the pulley control.

##### **Appointment Preference system testing process:**

* **Step 1**: Participants went to the page and saw an item selection screen with a fixed total of 10 points. They were told that they had to assign the 10 points to 7 items.
* **Step 2**: Participants assigned points to each item based on its importance and adjusted so that the sum of the points did not exceed 10.
* **Step 3**: The system displays the remaining points available for allocation in real time, prompting them to balance the allocation.
* **Step 4**: After completing the score assignment, click Submit to save.
* **Step 5**: Participants fill out a questionnaire to evaluate **the flexibility of the fixed total score allocation**, **the difficulty of task operation**, the **effectiveness of real-time feedback**, and provide suggestions for system improvement.

#### **3. End of Test**

* When participants have completed all the tests of the three systems, the system thanks them. "Thank you for completing the test! Your feedback is very important to us. You have just experienced three different item selection systems and we will continue to optimize these systems based on your feedback."
* All of the participant's ratings and feedback will be recorded, and their experience process is now complete.

#### **4. Post-testing**

* At the end of the test, participants will receive a thank you email confirming their participation and informing them of the importance of the test.
* Some participants may be invited to discuss their feedback further or to participate in subsequent iterations of the system for testing.

1. Results analysis process

**1.** **Appointment Preference system:**

#### **Participants' likes and dislikes of the allocation method**

* Some participants expressed a preference for the fixed total allocation method, believing that it prompted them to make sensible trade-offs and trade-offs between items, especially when resources were limited.
* Other participants felt that the fixed total score was too restrictive and felt that it did not allow flexibility in allocating enough points to their favorite items, resulting in an inability to fully express preferences.

#### **Suggestions for improvement**

* Real-time feedback and alerts: Some users suggested adding a feedback function to the system that could indicate which items might need to be adjusted during the allocation process, or show the remaining points available for allocation.
* Flexible allocation options: Some participants would like to be able to add additional points that can be allocated, or allow allocation limits to be dynamically adjusted based on the importance of the item.
* Visual feedback: Some users would like the system to provide more intuitive visual feedback during allocation, such as color changes to indicate how many points are allocated to each item.

**2. Positive/Negative Preference System**

1. **Participants' preference for the allocation method**
   1. Participants in this category were positive about the preferred selection method given by the system. They believed that this approach was innovative and could largely diversify students' choices when selecting their preferred items, while somewhat avoiding students being assigned items they were not interested in.
   2. This group of participants disagreed with the allocation method, which they thought did not visually reflect their preference for the items. The data comparison (scoring the items through 1-7) can visually demonstrate their preference for different items, and the parallel preference creates more uncertainty for the final allocation.
2. **Recommendations for improvement**
   1. Interface UI: While simplicity is necessary, a simple page does not demonstrate enough professionalism to convince students. Therefore, it is necessary to beautify the UI and add more system guidelines.
   2. Operational process: the process is relatively simple and student engagement is low. It is therefore recommended that feedback on successful preference submission be sent to students by email after completing the entire selection process.
3. Ethics

During the project, we securely stored all collected data using Google Drive. All data was kept on secure cloud servers with strict access controls and encryption to ensure data security.

Upon the project’s completion, we are committed to ensuring the confidentiality and integrity of the data collected. Initially, all personal identifiers will be removed from the dataset to anonymize the data, in compliance with our data protection policies and relevant regulations. The anonymized data might then be used for further analysis or research purposes.