

Quantitative Evaluation

For the quantitative evaluation, it was decided to conduct a task-based experiment to assess the overall quality of the interface. A similar design was already used in an earlier iteration to assess the usability of the Paper Prototype. In order to be able to compare the old and new results, the tasks and measurements from that time were adopted and expanded. In addition, the hypotheses to be tested were taken from the usability requirements and goals described in iteration 2 and also extended. Hypotheses that cannot be tested within the framework of a quantitative evaluation were excluded. The hypotheses, the selected measurements and the tasks can be found in the appendix. In advance, the test supervisors went through the tasks in order to obtain a best case value as a comparison for the measurements.

Setup: Due to the pandemic situation, the evaluation will be conducted completely remotely via Zoom with the test persons. The prototype will be provided via a link and throughout the session the test subjects share their screen with the test supervisor. The test subjects will have to open the prototype in the Google Chrome browser, that the console is visible to the test supervisor and that the screen size is set to the format of the Nexus 6. In addition, a screen and sound recording will be made throughout the session, which the subjects will of course be made aware of. With the help of the recording, some of the measurements can be accurately recorded afterwards, e.g. the time per task. In addition, according to the Thinking Aloud method, the subjects will be asked to say aloud what they are thinking so that the measurement 4 can be captured. The console has to be visible to the test supervisor, as the number of clicks are logged directly by the app.

Procedure: After the setup is secured, some demographic information of the subjects will be collected. A short scenario is then read to them and then the tasks are performed one after the other. One task will be read to each subject and then they attempt to solve it. After solving the tasks, the test persons fill out the System Usability Scale (SUS). The SUS was chosen because the tasks are already very intensive and it was assumed that the test persons would be more attentive with a shorter questionnaire. In addition, the questionnaire is standardised and easy to evaluate. After the questionnaire, the test persons are finally asked to list as many functions of the app as they could think of, regardless of whether they appeared in a task or not.

Participants: It will be attempted to find as many test subjects as possible who had not been involved in the project in any way before, i.e. know the functions of the app or have been a test subject in a previous iteration.

Hypotheses:

1. The user should be able to order food within 15 seconds, given that they know the app's functionality.
2. They can achieve their goals efficiently.
3. The app is accessible and accommodates to all types of users.
4. The app recognises, respects and caters to the users needs by helping them apply those needs in the restaurant.
5. The prototype achieves at least a score of 80 in the evaluation with the SUS.

Measurements:

1. Time user takes to complete the task (H1, H2)
2. Number of clicks (total) the user takes to complete the task (H2)
3. Number of errors for the task (H2)
4. Number of positive and number of negative statements of the user during the test (towards the system) (H4)
5. Number of users completing task successfully (without assistance) (H3, H4)
6. Number of system features the user can remember after the test
7. System Usability Scale (H5, H4)

Test Cases:

1. **Get Started** - Go through the On-Boarding Screens. Choose two allergies and two diets of your choice. Scan the QR-Code. Go to the Home screen. (Start: Get Started; Finish: Home)
2. **Call a Waiter** - Call a waiter to your table using the app. And then immediately cancel that you called a waiter. (Start: Home; Finish: Home)
3. **Order** - Take the first dish you find in the menu, find out if it is vegan or not. Then add it to your order and place your order. Do not pay right away. (Start: Home; Finish: Home)
4. **Preferences** - Edit your food preferences you have set previously. Change one of the allergies and one of the diets. Go back to the Home screen. (Start: Home; Finish: Home)
5. **Customise** - Go to the menu. Find the Cola. Add a Lemon to your Coke and then add it to your order. Go to your order. (Start: Home; Finish: Order)
6. **Past Orders** - (There should be something that was already ordered) Look at the dishes you have already ordered, but not paid yet. Say what you see. Delete the Cola from your order. (Start: Order; Finish: Home)
7. **Pay** - (There should be something that was already ordered) Pay for your dishes and then go back to the Home screen. (Start: Home; Finish: Home)
8. **Order History** - Take a look at the dishes that you already ordered and paid for. (Start: Home; Finish: Order History)
9. **Check Out** - You are done. Check out from your table. Do not give Feedback. (Start: Home; Finish: Scan QR)

Procedure:

1. Set Up
2. Introduction
3. Demographic Information
4. Scenario
5. Test Cases
6. SUS
7. Follow Up Question