# **Evaluation**

**UI testing approach and justification:**

We selected to implement a manual Lab UI testing approach as it allows for greater evaluation of subjective elements of our application without the need for specialised tools or suites for automated testing. Human observation allows for better identification of graphical glitches or inconsistencies which sometimes aren’t identified within automated approaches. This approach also allows us to find testers that match our chosen personas and end users, to better represent the range of computing skill and literacy of our intended users. Furthermore, considering the prototypical nature of our application the highly automatable aspects of UI testing become less important when compared with the user-friendliness aspects we hope to test such as typography, spelling, consistency and overall feel and design. Lab testing provides a platform to gather quantitative and qualitative data using varying questions, as well as, meaning we can observe the participant and the issue that can arise when different users use a system.

## **Ethical Consideration:**

We’re looking for volunteers who understand what kind of tests we want to undertake and understand what our system is for - we plan to create a consent form that will list what the user will be doing during the tests, why we are testing them and what we will do with the data from the tests. To protect the users the user is given a set amount of time we will be asking them to be available for as well as letting them withdraw from testing at any time, we will also keep their identity and other personal information private to keep them anonymous. During testing we will create a plan as well as have the user be supervised by someone who knows the system and have set tasks to complete during testing that will test the main parts of the system. The supervisor will also take notes and record problems the users have and any feedback after the tests. We must make sure all data we collect isn’t edited and comes from a wide array of users so that our analysis of data isn’t skewed in any certain way. We will also be carrying out all these tests under the guidelines from the BSC Code of Conduct in order to protect us and the volunteers.

## **Evaluation Plan:**

### **Scope**

Test 10 end-to-end user processes, including Logging in to a valid road user account user, Creating a new road user account, Road user viewing and then paying an outstanding toll.

### **Purpose**

1. Test if users can perform all of these processes.

2. See if users find any errors or usability issues

3. Measure how appealing our UI is

4. Identify if these processes are not convoluted

### **Schedule & Location**

In the user's home workspaces during the evening (requested by users).

## **Sessions**

1. Sessions will take 30 minutes to 1 hour

2. Sessions will begin with explanation of the application

3. Users read information sheet and sign consent form

4. Users are given time to view the system and processes we’d like them to attempt

5. Users perform all the processes

6. Users complete SUS form

7. Users are interviewed about their experience with opportunity for feedback

## **Equipment**

1. Laptop/Desktop computer with keyboard and mouse

2. Screen recording

3. Audio recorder

## **Participants**

Recruit at least 3 participants. All participants should be reasonable fits for our personas or within a normal range of computer literacy to allow for critical testing. All participants received an information sheet and a consent form.

## **Scenarios**

1. Log in to a valid road user account (*test1@test.com*, *Test123!*)

2. Find the bill to be paid on home page

3. Pay for the bill

4. Use the saved card to pay for the bill (cvv 123)

5. Navigate to toll history and view payment history

6. Create a new road user account

7. Log in to a valid toll operator account

8. Navigate to toll history and view a driver's toll history

9. Change language

10. Change the font size

## **Subjective metrics**

1. SUS questionnaire

2. Interview with participant with facilitator taking notes

## **Objective metrics**

3. Time taken

4. Number of errors

5. Number of times user used the back button

## **Roles**

1. Single person acted as facilitator and took some notes

2. Recordings also made (when participant agrees)

## **Report on the Evaluations:**

The data from the user evaluation showcased that the simple U.I of the site was helpful for users of all experience levels, however some users with less experience using technology had trouble when starting to use the system as the home page is where the user pays unpaid invoices and looks like the toll history page. Another common point during testing was the creating a new password when registering a new user, the site doesn’t say what a password needs to contain until the user makes a mistake/ their new password isn’t accepted. The testing also showcases how successful some of the ethical considerations we made during development are such as making sure the site's design was simple enough for colourblind users as well as adding magnification for users with poor eyesight; these features proved useful for our evaluation testing. During the evaluation it was highlighted that it is not explicit that the user is required to click the drop down to use a saved card to pay. Another thing that the evaluation demonstrated was that some of the translations were slightly incorrect, and in some cases there was text that was not translated at all.

## **Results and Re-design Suggestions**

SUS Scores:

1. 97.5
2. 75
3. 92.5
4. 75
5. 95

Average SUS Score = (97.5 + 75 + 92.5 + 75 + 95) / 5 = 87

This falls within the “Best” section on the SUS scale, we believe this is due to our acknowledgement of usability issues and attempting to keep the UI simple and uncluttered with unnecessary information.

One of the main shortcomings of the application was lack of direct instructions and helpful advice, namely, during the “create new road user” scenario. Upon a redesign of the application, we would include a set of instructions highlighting the password creation constraints clearly above the password creation form and provide suggestions as to what special characters are so that users unfamiliar with computers can be informed as to what they are. Another redesign suggestion we would implement ways to make a point to ensure the user is aware who they are logged in as and their role on the system to avoid unnecessary confusion and possible frustration on whether they need to re-log in. We also would add a small text display on the payment page to indicate to the user that to access saved cards they have to click the drop down and select the desired card and then enter the corresponding CVV.

Furthermore, we would manually translate each page on the system rather than using an api that currently does a simple machine translation on every text element on the current page. Finally, we would alter the home page to inform the user about the navigation of the website and where they might find things.

(Check Evaluation Notes for evaluation findings)

(Check Sus forms for sus scores)