

Project 4 - Evaluation (10 points)

24/10 - Adds clarifications to submission requirements

This project task is the last of four project tasks that together take you through one iteration of the complete design process.

As a reminder, the overall goal is to design a smart phone app helping university students to plan their daily commute to the university from home and vice-versa. The app should support:

- Allowing students to plan their commute (i.e. bus, trains, shared transport, etc.) according to their personal calendars/time tables (i.e. lectures, meetings, etc.).
- Helping students to find the ideal bus/route/bus stop depending on the time, start and end locations.
- Allowing students to give real-time feedback and comments on buses, routes and stops, so that other students can benefit from the information.

Please keep all of your answers short and on point, and write them in concise bullet points. Please read the instructions for submission at the end of this exercises. Addition to the answer sheets you have to prepare a *mandatory* presentation for this exercise.

In this project task your goal is to evaluate your high fidelity (hi-fi) prototype. To this end, you will design and run a small controlled experiment, in which you compare the users' performance between your prototype and the local commute planning app *Opal Travel* as a baseline.

As a first step, download the *Opal Travel* app and familiarise yourself with it:

- Android: <https://play.google.com/store/apps/details?id=au.com.opal.travel&hl=en>
- iOS: <https://apps.apple.com/au/app/opal-travel/id941006607>

In your experiment, 4 participants shall perform a given task with your prototype and the baseline app. For each test you will measure the time needed and any errors observed.

Tasks:

1. Procedure of your Experiment

- (a) Prepare an experimental task that will be performed by the participants and develop instructions for the task. Your task should be a realistic sequence of actions as they would occur in practice when a user is planing the commute.
 - Make use of the functions you have implemented in the last project phase. (e.g. Configuring trip origin and destination, Configuring timing information, Managing frequent routes, etc.)
 - Include at least 5 actions (enter destination, enter time, etc.) with at least 3 of them are unique.
 - Make sure the actions are possible in both your prototype and *Opal Travel*.
 - The instructions should be formulated and written so that they can be read to the participants to ensure that all participants get the same instructions.
 - Here is a short example of an action sequence (note, these are not the complete instructions):
 - Add the starting bus stop.
 - Add the destination.

- Put start time.
 - Add this configuration to frequently used route.
 - Search for the bus information.
 - See bus information for the same route 30 minutes later from the start time. *For modes with service frequencies longer than 30 minutes, choose a suitable time instead.*
- (b) Prepare a Participant Consent Form (PCF) and Participant Information Statement (PIS). Use the templates (*General*) provided on the Project Phase 4 assignment page on Canvas. You will not be recording audio, video or photos, so remove all unnecessary parts from the templates.
- (c) Prepare a questionnaire.
- Write your own questionnaire to collect Information about the participants (see slides 69 to 73 in “Evaluation 2 of 2”)
 - Use the NASA TLX questionnaire for participant feedback. It is available as an app from <https://humansystems.arc.nasa.gov/groups/TLX/tlxapp.php>.
- (d) Prepare the trials
- Prepare within-subject trials targeting 4 (3 if your team has less than 4 members) participants.
 - Each participant should do the task with both your prototype and the *Opal Travel* app
 - Record time taken and any errors for each participant
 - Be sure to account for order effects, carefully consider counter balancing as necessary at each step. (See slides 60 to 66 in “Evaluation 2 of 2”)
 - Include time to demonstrate the applications or letting participants practice
- (e) Combine all of the above and add missing details (e.g. breaks, arriving, welcoming) to a complete procedure description. Hand in the complete procedure description (including instructions).
- (f) Run a pilot experiment with at least one participant (Can be a group member).
- Make sure you run the experiment exactly following your written procedure.
 - Make note of difficulties and problems during the pilot study.
 - Adapt the experiment procedure accordingly.
 - Briefly explain the changes you have made.
2. Conduct the experiment
- (a) Select 4 (or 3 as for above 1.d) typical users. Users can be friends or colleagues but exclude members of your group.
- (b) Conduct the experiment according to your procedure from above.
- (c) Hand in your collected **and anonymised** dataset (use Excel or CSV format).
3. Data analysis
- (a) Calculate the mean and standard deviation for both time and errors. Do this for both your own app and for *Opal Travel* (Hint: You can calculate this using Excel).
- (b) Calculate the mean and standard deviation for participant age and NASA TLX scores.
- (c) Briefly summarise the results above and your findings.
- (d) *Note: typically, one would conduct further statistical analysis to see whether there is a significant difference between both conditions in terms of time required and errors produced. This would however require a larger sample size, i.e. more participants, which is out of scope for this exercise. If you are interested, feel free to read up on statistical testing, e.g. the t-test.*¹

¹For example in ‘How to Design and Report Experiments’ by Andy P. Field and Graham Hole. Sage, 2003.

4. Field Study

- (a) What additional findings could you get in a field study of your app that would not be produced in the controlled experiment?
5. In addition to the answer sheets you have to prepare a slide set, which you will present during the tutorial. The presentation should focus on your designs and how they were refined and relate to the requirements you identified. (Presentation will be graded and count into 10% of the final grade of this project phase).
- Pay attention to Task 1.e, 1.f, 3.c and 4.a when you make the presentation.
 - The number of slides should be approximately 10, and you should be able to finish the slides in 10 minutes sharp. You will not be allowed to run over, except in the event of technical issues.
 - All members from the group should take part in the presentation.
 - You must use the presentation that was submitted to Canvas. You will not be allowed to change the presentation after submission.

Instructions for submission:

- Only one student per group needs to upload the submission to Canvas
- You can upload your submission to Canvas multiple times ahead of the due date/time. The final submission will be marked.
- The *presentation* is due **Wednesday, November 6 11:59pm** ready for the tutorial.
 - Your presentation should be submitted in PDF or PowerPoint PPTX format.
- The *report and prototypes* will be submitted to Canvas no later than **Friday, November 8 11:59pm**.
- The following submission items should be in PDF format. You will need to submit 3 files:
 - Your written report, including: experimental task details; design decisions for both the horizontal and vertical prototypes; and anonymised PCF and PIS forms for all participants
 - The horizontal prototype PDF exported from Balsamiq
 - The vertical prototype PDF exported from Balsamiq
- Your experimental data must also be submitted as a Excel or CSV formatted file.
- If one of your group members is not contributing to the project work, you must inform your tutor well in advance, not after the assessment deadline.
- This is a creative exercise. Innovative ideas and solutions are rewarded in grading.
- Please include your report responses into a single document, with any research findings attached as an appendix.
- You should include the following details on the report cover page:
 - The names and unikeys of your group members
 - Your group name or number
 - Which tutorial you attend (i.e. R10A)