Human-Computer Interaction: Design & Evaluation

Lab 3 exercise sheet – Week 4 – AE2 Preparation

PRODUCT EVALUATION EXPERIMENT- AE2

In AE2, you will conduct an HCI experiment to evaluate an interactive system. With your group, in this series of two labs, you will first (Lab3 – this lab sheet) plan the experiment to evaluate the product you have selected; you will then (Lab4) conduct the experiment and write up a report on your evaluation.

The Evaluation Product

You will evaluate the same product as the one you evaluated using heuristic evaluation in AE1. In exceptional cases, we may allow you to change products (e.g. in case the product is deemed unsuitable for an evaluation). Please contact the course lecturers in case you believe this is required for your team.

Lab 3 – Planning the Evaluation Experiment

In this lab, Lab 3 (Week 4), you will design and plan the experiment. No matter how basic the evaluation method is, you will not get a good return of the experiment if you jump into it without proper preparation.

You will need to decide a) What precisely you would like to assess about your product – what is your research question(s) for this evaluation? b) What methods you will employ/data you will gather to answer this?

Note: You do not have to perform a large, comprehensive evaluation that assesses every possible aspect of your product. We are looking for small, well-planned studies on a focused problem. Avoid measuring many different types of data; limit any questionnaire to 5-10 questions; only plan up to 2 or 3 conditions and/or tasks for your users. Plan to take no more than 30 minutes of a participant's time. Discuss your plan with your tutor if you are unsure.

What should we evaluate?

- With your group, try to think of an HCI aspect that you are genuinely interested in discovering about your product. Think of typical tasks that a user would do with your product in terms of how they are well-designed and effective from an HCI perspective. You may consider evaluating whether some tasks with the product are successful or unsuccessful, easy or difficult to learn, fast or slow, safe or prone to errors, satisfying or frustrating...
- Formulate your area of interest into a precise research question that you can try to answer with your evaluation. Here are some examples:
    - Is the registration form prone to errors?
    - Is the application easier to use on laptop rather than on a smartphone?
    - Can users easily place a new order?

How should we conduct the evaluation and collect data?

There are many forms of data to collect for evaluation, and you are free to select between them, or you can use any other form you know of that you feel would be appropriate for your research question. Some examples of approaches and data you can collect are:

- Observe your participants when using the app and note any critical incidents, indicating anything notable such as: sighs, head shakes, participant hesitations, etc. Note any obvious errors or task breakdowns, and use the think-aloud technique for users to articulate their thoughts.
- Give a standard usability questionnaire to give users after they complete a task with your product, and compare with standard usability scores.
- Measure key performance metrics (e.g. time to complete; number of errors; etc)
- Screen record users using your product.
- When appropriate, think of independent variables (e.g. gender; type of device; etc) and dependent variables (e.g. time to complete; number of errors; etc)…

You should design user tasks for participants to do during the experiment e.g. asking them to register, buy a book using a laptop and a smartphone, or cancel an order. The tasks should be related to your research questions, and allow you to collect data about their interactions with the product. When designing these tasks, think about your research questions, and the most relevant tasks that users want to do with the product, in terms of goals users would typically like to achieve with the product. Based on those goals, write task scenarios that you will ask users to follow during the experiment. The task scenario should provide motivation and context, and should be realistic and actionable. However, avoid being too specific, e.g. don't describe exactly how to do the task on the product interface.

Here's an example:

> -User goal: *Register and create a new account on an online second-hand bookstore.*
> -Poor task: *Go to the website, on the right menu, find and click "Registration". Click and tell me where you would find Registration.*
> -Better task: *Imagine that you are a graduating student with a lot of used books you would like to sell online. You recently learned about this online second-hand bookstore. Your task is to register and create a new account on the online book store.*

You will conduct a small evaluation with only a few users. Therefore any analyses, data visualisations and conclusions that can be drawn will be limited. This is inevitable in trying to conduct an evaluation quickly as part of a coursework exercise; thus, we encourage you to still run such analyses but noting how your small sample size can affect your results. You will not be penalised for using a small sample size, or any shortcomings in your study that result from this.

To avoid the hassle of recruiting participants, you should pair up with another team in your lab slot – you will act as participants for their evaluation, and in return they will be your participants. While we will assign you a paired team to do this with, you may need to contact other students if the other team isn't responsive.

Consider that you might have to do your evaluation remotely or in the university lab spaces.

Therefore, be realistic in your ambitions. For example, you will be unable to specialised equipment (e.g. eye-tracking); we encourage you to keep things simple. Your evaluation should also not be very time consuming for your participants. You should plan to take at most 30 minutes of any participant's time.

What do we need to plan to conduct the evaluation?

Depending on the choices above, different preparation work will be required. You will need to design a series of tasks that you will give a user to perform, work out technical procedures for screensharing and/or screen recording, write or identify relevant questionnaires, participant information sheets, etc. Discuss with your lab tutor to make sure your experiment plan is robust and that you have thought of all you will need.

Important: One thing you are likely to need is an ethics checklist form. See https://www.gla.ac.uk/schools/computing/informationforstudents/#ethicsprocedures to ensure that your planned evaluation meets the criteria outlined. Check and sign the University's ethics checklist for assessed exercices: https://www.gla.ac.uk/media/Media_515046_smxx.doc

Before running the actual study, run a pilot study (even just among yourselves) to make sure that your materials and procedures are in place. Pilot studies are very useful to identify issues in experiments, e.g. whether instructions are clear, whether tasks are workable, whether the system runs smoothly, and that any relevant data is being recorded.

Your tutor can discuss these or any other issues with you if you are unsure about any part of your experiment plan. If you follow established practices as outlined in lectures or textbooks, you are not taking too much participant time, and you have run a pilot and ensured everything works, then your plan is probably fine!

AE2 Report

Your report for AE2 will be due on 20/02; full details are available on next week's lab sheet (Lab 4, Week 5). While there is nothing to submit for this lab, you may want to start thinking about preparing elements of your final report.

To prepare for your final report, **working as a group**, produce a document containing:

- Your team ID and team members' names and GUIDs.
- Product description (~1 paragraph): Describe the product that you are evaluating.
- Evaluation goal (~1-2 paragraphs). The primary research question(s) that you are investigating, and a short explanation of why you think it is important to conduct on this product.
- Evaluation plan. This will be different depending on the type of evaluation you have chosen to conduct, but could include:
    - descriptions of how the evaluation is planned to be conducted (e.g. will it be done in person or remotely?),
    - independent/dependent variables (if any), control, random, confounding variables (if any)
    - information on how participants will be briefed and debriefed
    - precise instructions of tasks participants will be asked to perform (if any),

- descriptions of the type(s) of data being recorded and how data was captured, including questionnaires (if any), observations, or other measures
- a completed ethics checklist
- Note: this is not an exhaustive list; and all elements may not apply to you. Discuss with your tutor and use your judgment to prepare these elements.