COMP3008: Human-Computer Interaction
School of Computer Science
Carleton University, Ottawa, Canada
Winter Term, 2018

Project 1: Interaction Design Process

Specified: 2018-01-09 — Due: 2018-02-16 (Kickstart Document Due 2018-01-26)

Introduction:

This project is to practice and explore the elements of Interaction Design process as presented and discussed in class and in the textbook.

The application domain is university student course and degree planning. You will be familiar with this domain, which will have both advantages (it saves time in the short duration of our course) and disadvantages (you need to be careful not to just replicate designs you already know and use).

The domain and goals are described in a little more detail below. The process you are to follow is then described, involving 4 main steps: requirements analysis, initial design alternatives, prototyping and iteration, and usability evaluation. Each of the 4 steps is explained, outlining the work you need to do, and how to prepare a report for assessment. (Approximate page lengths for the sections of the report are suggested below, where a page is approx. 350 words).

This project is to be done working in small teams: 3–5 people. You are responsible for organizing and managing your group. Please use the forum on CULearn to make connections, and contact the Instructor or Teaching Assistants if assistance is required. You should have your team chosen by Monday, January 15th, 5PM.

Throughout the duration of this project, the Teaching Assistants will have regular office hours. We have 6 excellent TAs, all with experience in Human-Computer Interaction. Please make use of them.

Domain and Goals

A University degree is a significant undertaking, typically involving years of academic work. Moreover, simply planning and managing a degree program can also be challenging. Many students, especially new students, have difficulty with this, both initially and when progressing through, or making changes to, their degree program.

This project is to design software to help. In particular, the emphasis should be on planning and exploring possibilities as the student progresses through their degree program from first year to graduation. You may assume any helpful information is available to your system, including class sizes, pre-requisites, and anything else appropriate and reasonable.

The domain elements involved are degree programs, majors, minors, and streams, and their rules, courses, alternatives, prerequisites, restrictions, numbers of credits, cumulative grade point average (CGPA), and similar details.

You need only be concerned with student users, not administrators or professors. The user goals will typically involve completion of a desired degree effectively and efficiently as possible, while understanding that plans change, and trade-offs may be necessary.

As is typical in Interaction Design, this description is on purpose left at a high level. Determining more details of the requirements and design is up to you.

Project Steps

A Note on Ethics

Steps 1 and 3 involve working with study participants to help you in design and in determining usability. The project has been reviewed and approved by the Carleton University Research Ethics Board. The course will include a presentation on ethics in user testing before you will need to start work. When working with participants, you must first obtain a participant's informed consent using the consent form, conform to commitments made on the form, and afterwards give them the debriefing form explaining the purpose of the work. These forms are available on the COMP3008 CULearn page. (Write your name(s) at the top of both the consent and debriefing forms. Completed consent forms must be scanned or photographed and included as an appendix to your report.)

0: Kickstarting – 10%

To start the project you should get a high-level overview of what is involved, formulate some candidate ideas for the earlier steps, and then work together to develop a shared understanding of how to proceed.

- To get a high-level overview, everyone in the team should read the project handout carefully.
- Work together and decide on some candidate ideas for the early steps, and create a "Kickstart Outline" document. This should be brief, 3-5 pages, recording your initial ideas on the project. The document should include the following:
  - A name for your project, and the names, student ID numbers, and email addresses for all team members.
  - The degree program you plan to address: which degree, any specializations, and your rationale for the choice. *3–5 sentences.*
  - A list of 3 important usage scenarios, describing what the user needs to accomplish, and what issues might arise, for each. *3–5 sentences each.*
  - A list of 3 different kinds of users likely, and their distinctive characteristics. *3–5 sentences each.*
  - A plan for how you will recruit participants to help develop your understanding of requirements. *3–5 sentences each.*
  - An initial interview script, showing 5 questions you will ask to help you develop a user perspective on the requirements the software. *1–3 sentences each.*
  - Sketches showing your ideas for possible prototypes: these should be rough sketches only, to facilitate discussion. Scan or photograph the sketches and include them in the document. *Note that these sketches are only to help early discussion, and do not indicate of constrain your later designs.*

- **Submit your document on CULearn by the deadline, Friday January 26th, 5PM. Early submissions will be marked and feedback given as soon as we receive them. Late submissions will not be accepted and will forfeit the 10% marks.**

1: Requirements Analysis – 25%

To develop an understanding of the requirements, you need to conduct some data gathering and analysis exercises.

- Choose a Carleton degree program to focus on: you may choose any undergraduate degree except Computer Science. You should then familiarize yourselves with the degree requirements using University and relevant Department websites and published materials. Identify at least 3 likely personas for student users. Design at least 3 scenarios likely to occur in degree planning.

  Report: Identification and outline of degree program, elaboration of potential student personas, narratives of potential scenarios — approx. half a page for each persona and each scenario.
- Next, you should conduct interviews with participants. You should recruit at least 5 participants for sessions of up to 30 minutes. For each participant, the study should consist of two parts, interview and observation.

  For the interview, you should design a brief semi-structured interview script to elicit the participant's attitude and approach to degree planning, their goals and strategies. Use your script to guide the interview, and take notes about the participant responses. You may wish to conduct the interview with one team-member interviewing, and another taking notes.

  For the observation, you should use the degree information that you have identified, along with the scenarios you identified. Ask the participant to role-play the scenario, using the degree information, and thinking aloud. Take notes on their activity as they work through the scenario.

  Report: Interview script, interview and observation and notes from at least 5 participants — approx. a page for the script and at least one for each participant.
- Finally, work as a team to organize and interpret your notes from the interviews and observations. First review and improve or change your personas and scenarios based on what you have learned. Then develop an Affinity Diagram. Record your final diagram(s), and identify and outline the key requirements for your design.

  Report: Improved or changed personas and scenarios, affinity diagram(s), descriptions of key requirements — approx. 3–5 pages.
- References: SRP Ch. 10 (Requirements) and Ch.7 (exclude 7.5) (Data Gathering), Ch8.4, 8.6.1 (Theory); Paper on Personas by Pruit/Grudin; Extra notes on Affinity Diagrams on CULearn.

2: Initial Design Alternatives – 25%

Based on what you have learned in the previous step, you should now design *2* alternative prototypes. Consider interface styles, patterns, and theoretical design frameworks. You should endeavour to come up with two *distinct* designs, based on differing design rationales. For **each** design:

- Describe the rationale for your design, referencing what you learned in the previous step, your design approach, and why you feel this design will have advantages relating to the requirements. Choose a name for each design that identifies its key characteristics.

  Report: design name and rationale — approx. 1–2 pages.
- Use either *Moqups* (see `moqups.com`) or *Balsamiq* (see `balsamiq.com`) to create low-fidelity prototypes of the main visual elements. You may use a free account, but we also have professional-level accounts you may request: email the instructor to request access for your group. Create a story-board for one of your scenarios, using the low-fidelity images for your design, with captions and markup annotations explaining the interaction.

  Report: Your separate low-fidelity images, and your story-board — approx. 3–5 pages for each design.
- References: SRP Ch. 11 (Prototyping), Paper by Rettig on Lo-Fi Prototyping.

3: Prototype Evaluation and Iteration – 30%

- To decide which of your two prototypes to proceed with, you should conduct a Cognitive Walkthrough for each, using your low-fidelity prototypes. All the members of your team should be involved with the Cognitive Walkthrough. Compare the results, and make a decision which design is better.

  Report: Produce a summary of the results of your two walkthroughs, outlining how well each design supports learnability and overall usability — approx. 2 pages for each walkthrough. State which prototype you chose to proceed with, with the rationale for your decision — approx. 1 page.
- You should now test your design prototype with participants. Use the low-fidelity prototype, and employ the Wizard-of-Oz usability approach.

  You should conduct at least 2 iterations of testing and design improvement. At each iteration your testing should involve at least 3 participants. For **each** iteration:

  Describe the results of your testing, citing participant behaviour and satisfaction — approx. 1–2 pages. Then explain the changes you made to improve your design, showing the new visual elements — approx. 1–3 pages.
- References: SRP Ch. 11 (Prototyping), Ch. 15.2 (Cognitive Walkthrough); Paper by Spencer on Cognitive Walkthrough; Paper by Dow on Wizard-of-Oz technique.

4: Usability Inspection Evaluation – 10%

- For your final prototype design from step 3, now conduct a Heuristic Evaluation. You should use Nielsen's general usability heuristics, and follow the steps of the procedures. In particular, each of the members of your team should conduct an evaluation before you proceed to the consolidation phase.

  Report: Produce a summary of the results of the Heuristic Evaluation, showing the independent results, as well as the consolidated results, both including each identified issue and it's priority and severity — approx. 1 page per evaluator, plus 1 for the consolidation.
- References: SRP Ch. 15.2 (Heuristic Evaluation).

Assignment Submission:

Throughout the period of the project, the teaching assistants will be available during their office hours for advice and feedback as you work through the project steps. For example, you may wish to seek feedback on your interview script before working with participants.

For the project report, please write up the steps of your study as described above. Please ensure that the entire report is in a single PDF document. Upload the file following the submission instructions on the web site.

The project is due at 5PM EST February 16th. Projects submitted or updated late will be penalized by a deduction of 10 marks (out of a possible 100) per 24 hour period, or part thereof.