Experiments

Spencer Smith
McMaster University, Canada
smiths@mcmaster.ca

Jacques Carette
McMaster University, Canada
carette@mcmaster.ca

Olu Owojaiye
McMaster University, Canada
owojaiyo@mcmaster.ca

Peter Michalski
McMaster University, Canada
michap@mcmaster.ca

Ao Dong
McMaster University, Canada
donga9@mcmaster.ca

1 User Experiments

1.1 Usability Experimental Procedure

1.2 Procedure

1. Survey participants to collect pre-experiment data
2. Participants perform tasks
3. Observe the study subjects (take notes, record sessions(OBS screen recorder), watch out for body languages and verbal cues)
4. Survey the study subjects to collect feedback (post experiment interview)
5. Prepare experiment report
6. Perform pairwise comparison analysis
7. Prepare analysis report

1.3 Task selection criteria

**The task selection will be determined with the aid of the domain experts attached to any of the selected projects.
**The domain experts will be asked to consider the below criteria when defining a task.
**Domain experts will also be asked to identify what background knowledge is necessary for the suggested tasks - Novice, Intermediate, Advanced

1. Collectively all tasks should not take no more than 2 hours.
2. Selected tasks should reflect common use cases of the software.
3. Include tasks that require a set of sequential or hierarchical steps to be completed

1.4 Usability Questionnaire

Two sources of standardized usability questionnaire we could use.
- https://www.usabilitest.com/sus-pdf-generator- 20-29 - SUS.
- https://uiuxtrend.com/pssuq-post-study-system-usability-questionnaire/ - PSSUQ

2 Modifiability Experiments

copied from Methodology:

[note: these experiments need to be completed - to be discussed at next meeting —PM][meeting: start thinking about maintainability experiments; maybe change to modifiability; at least describe what we would do for such experiments - measure sensible changes, what does a small change mean exactly, document 'likely changes' - see Parnas; modifiability - we want to be explicit about what we want to modify; how to we interpret the results?; Add these experiments to user experiments file, in such case change file name, keep format similar to user experiments (procedure, no questionnaire, add preamble describing comments above), such experiments would get quantitative measures —PM][SS:For the maintainability experiment, I think we should write it up in the methodology, even if we don't do it. Discussing maintainability is needed to fit with the research questions (since maintainability is part of sustainability). We want sustainability to fit into the bigger context of what interests research software developers. As far as the maintainability experiment goes, we can just ask the domain experts to make a likely change and ask them to record their experience with making the change. It isn't quantifiable, but it would give us qualitative data. —PM]

2.1 Procedure

References