Think-Aloud Usability Evaluations

SWE 632
Spring 2018
Administrivia

- HW 3 due 3/1 (Thursday)
- In-class midterm next week
- HW 4 out next week, due 3/27 (4 weeks from today)
Midterm review
Usability Studies
Why conduct usability studies

• Evaluate interaction design with real empirical data, gathering ground truth of user performance

• Identify usability issues
Design Process Big Picture

Need finding

Evaluation

Design

analytical
heuristic evaluation (Lec 1)
design principles (Lecs 8 - 14)

Empirical
usability evaluations (Lec 6)

contextual inquiry
(Lec 4)

sketching
prototypes
storyboards
(Lec 5)
Think-aloud usability study

- Goal: observe users using app, identify usability issues

- Can use with
  - paper prototype
  - HTML prototype
  - Wizard of Oz study
  - actual app
Steps in a usability evaluation study

- Formulate **goals** of study
- Design study protocol, tasks, materials, data collection, …
  - Pilot study design
- **Conduct** study
- **Analyze** data to assess task performance and identify usability issues
Formulate study goals
Study goals

- Where are you in the design process? What feedback do you seek?
  - Exploring new design idea
  - Validating high-level approach
  - Identifying important usability issues
  - Evaluating a new feature just added or a particular corner case
  - Studying performance by specific users (e.g., expert users familiar with old version)
  - Comparing performance against competitors
Study design
Selecting participant population

• Who will be the users?

• Goal: users representative of system’s target users

• Are there multiple classes of users (e.g., data analysts, site administrators)?
  - If so, which are appropriate given goals?
  - May choose several classes

• System novices or experts?

• Might choose to include UX experts to help flag potential issues
Number of participants

• More participants —> different participant interactions, more data

• Fewer participants —> faster, cheaper

• No right answer, as depends on potential diversity of interactions and users

• Nielsen & Morlich (1990) found that 80% of problems could be detected w/ 4-5 participants
  • Most serious usually detected with first few
  • Krug suggests 3
Informed Consent

• Important for participants to be told up front what they will do and provide affirmative consent

• Helps allay potential participant fears

• Make clear purpose of study

• Make clear that you are evaluating your design, **not** the user
Tasks

• What will users do?

• Goals for task design:
  
  • Provide specific goal: something that the user should accomplish
  
  • Comprehensive enough to exercise key features of your app
  
  • Short enough to minimize participant time commitments
Communicating tasks

• Provide a scenario explaining the background of what users will be doing

• Provide a specific goal that the user should accomplish
  • But **not** how they should accomplish it
  • Don’t give away how you hope users will accomplish goal

• Communicate **end criterion** for task - how do they know they’re done?

• Provide maximum time limit after which they will be stopped
Recruiting participants

• Many potential sources
  • Co-workers, colleagues, friends, family
  • Email, mailing lists, online forums
  • Announcement at related user groups

• Important to select sources that best match the background & knowledge of target users
Incentives for participants

• Often (but not always) helpful to pay participants

• Most applicable when seeking participants with specialized expertise with whom you do not already have a personal or professional relationship

• Can also offer other incentives, such as gifts, coffee mugs, gift certificate; or free consulting, training, or software

• In some cases, just learning about future product can be incentive
Managing participants

- Participants are valuable resource
- Often finite resource
- Think carefully about how participants will be used
- Devise mechanisms for scheduling participants & reminders
Training

- Goal: **avoid** unless really necessary

- Training necessary when
  - Participants require specialized knowledge to act as target users
  - Target users will have access to specialized training materials before they begin study
Data collection

- Think aloud
- Screencast
- Questionnaires interview questions to gather participant feedback
Questionnaires and interviews

- Gather background or demographics about participants (if important)

- Supplement task performance data with subjective reactions
  - Perceptions of design, comments on potential issues, ideas for features

- Questionnaire - pre-defined questions, focused, less bias

- Interviews - more open ended, longer responses
Example open-ended questions

• What did you like best about the UI?

• What did you find most difficult or challenging?

• How might the UI better support what you’re trying to do?
Piloting study design

• Dress rehearsal for conducting actual study

• Goals
  • Ensure software / prototype won’t “blow up”
  • Test tasks - ensure right length & difficulty
  • Test that materials are comprehensive and comprehensible

• As-needed piloting
  • Use first study session as pilot only if issues arise and must be addressed
Conducting the study
Introduction (1)

- Greet participants, introduce yourself, thank them
- Build rapport, socialize
- Introduce them to the setup
Introduction (2)

• Give participant Informed Consent

• Answer any questions about study design

• Relieve anxiety and curiosity as much as possible

• Make clear evaluating design, not participant

• Let participants know you can’t answer questions about how to do task
Starting session

• Give participants description of task
• Start any video recording
• Start encouraging participant to think aloud
• Begin observing participants work on task
Interactions during the task

• Goal: listen, not talk

• Prompt participants to think aloud when necessary
  • e.g., What are you trying to do? What did you expect to happen?

• If show signs of stress / fatigue, let them take a break

• Keep participants at ease
  • If participants frustrated, reassure & calm participants
  • If so frustrated they want to quit, let them
Giving help

• If participants totally off track, small reminder of goal might help

• Should **not** give participants information about how to complete the task

• What if user asks for help?
  • Direct them to think through it or work it out for themselves
Collecting critical incidents

• Any action that does not lead to progress in performing the desired task

• Often related to a gulf of execution or gulf of evaluation

• Generally does not include

  • accessing help

  • random acts of curiosity or exploration
Understanding a critical incident

• Important to understand in the moment what users goal is and what actions they are taking

• When a critical incident occurs, jot down

  • The time
  
  • What user was trying to do
  
  • What user did
Wrapping up the study session

• Provide questionnaire (if applicable) / conduct interview (if applicable)
  • Probing into causes of behavior
• Answer any lingering questions the participant may have
• Thank the participant!!
• Provide any incentives (if applicable)
Reset study environment

• Make sure study environment is in the same state for all participants

• Reset browser history / cache (if applicable)

• Delete any user created content or materials
Analyzing data
Critical incident analysis

• Identify critical incidents where something went wrong

• Easiest to catch in the moment - important to take good notes

• Going back and looking at screencast can help you study context of issue in more detail
Reporting a critical incident

• Problem statement: summary of problem and effect on user (but not a solution!)

• User goals: what was user trying to do?

• Immediate intention: at the moment in time when problem occurred, what was the user trying to do

• Possible causes: speculate on what might have led user to take action they did
Critical incidents --> usability issues

• Group together similar incidents to form **usability issue**

• Match similar critical incidents within and across study sessions

• Identify underlying cause

• Brainstorm potential fixes
In class activity
Group activity

• Form groups of two (not anyone you’ve worked with before)

• Take turns conducting a usability study of your project app
  • 5 mins to brainstorm 5-10 min task
  • 15 mins to conduct study
  • Identify critical incidents (if any)