Think Aloud User Studies

SWE 432, Fall 2018

Web Application Development

Today

- How can you conduct a think-aloud usability study?
- How can you use a usability study to identify usability issues?
- Final exam discussion

Side bar: User Scenarios

- Recall: User scenarios
  - Each scenario tells a story, a little bit richer in detail than use cases
  - Multiple users might have different scenarios but the same goal
    - Scenario captures technological/sociological/ economic consequences of some design
    - Scenarios might be based on a single user or on a persona

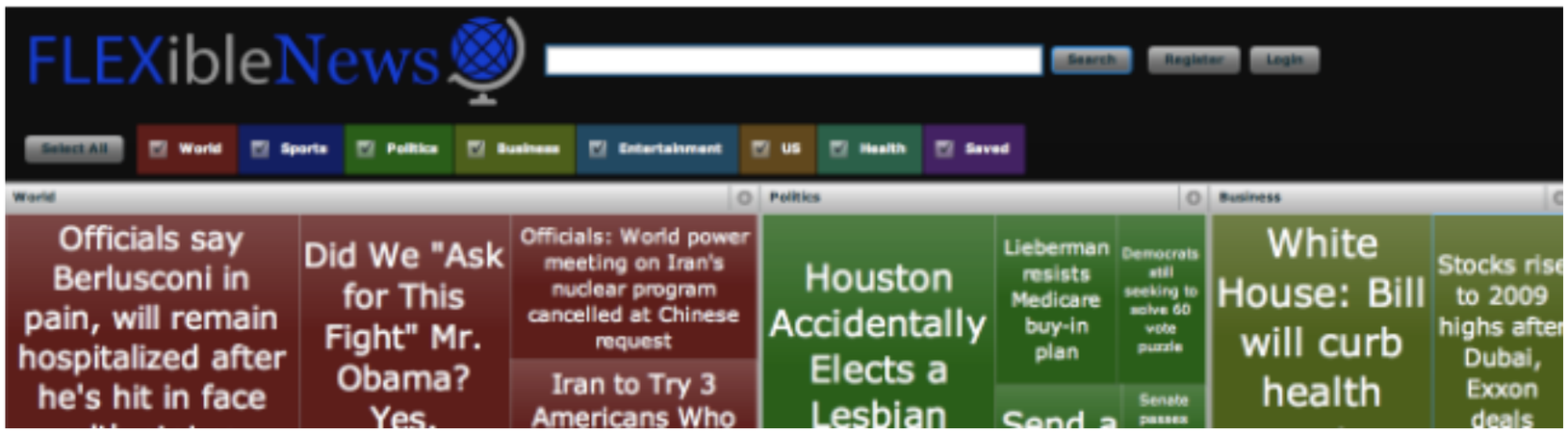
Side Bar: Scenarios and Personas

- Personas are stereotypes that stand in for a class of possible system users
- When describing a persona, often invent details to bring persona to life as a stand-in for a real user
- Interesting further reading:
  - https://www.microsoft.com/en-us/research/wp-content/uploads/2017/01/personas-practice-and-theory.pdf
  - https://www.microsoft.com/en-us/research/wp-content/uploads/2017/01/PersonaBook.pdf

Activity: Scenarios and Personas

- Consider possible scenarios and personas for users of a news site (same example that had sketches in the slides)

- High level goal of the app is to allow users to scan multiple news articles and view what they would like to



Persona - Example

Katie, 19

Katie is a sophomore in college. She is a sophisticated girl who likes to read the newspaper and know what is going on. In high school, Katie used to read the entire New York Times every day. However, she's found that she has much less time on her hands than she used to, and can't devote so much time to current events. She wants to be able to see the most important stories from a broad spectrum of new sources and categories. The problem that she has is that when she sees massive amounts of information, she wants to know about all of it. She needs a way to prevent information overload so that she can look at news without being tempted to spend hours reading every article on the page.

User Scenario - Example

Use Scenarios: "The random walk"

Katie wakes up in the morning, takes a shower and gets her morning cup of coffee. She sits down in front of her computer, and in the remaining 15 minutes before class, opens FLEXibleNews to get her "Early Bird Brief" - a summary of what happened across the world the night before. She opens FLEXibleNews and is immediately presented with an overview of the current news. By default, the interface shows all recent news, organized by category (each category has a different color) and sorted by "interestingness" (to be defined further later). She sees a headline that seems interesting and hovers over it. She immediately gets a popup that shows a brief summary for the headline. She reads the summary and decides that it's not that interesting, so she ignores it and drifts over to another headline. This time, it's interesting, so she clicks on it and the article opens in a new window, on the original provider's website. Katie reads an entire article on a new breakthrough in human-computer-interaction and decides that it's really interesting. She closes the article and goes back to FLEXibleNews and this time puts in the search query: "human computer interaction." The query executes and the display updates, now showing only articles related to HCI, sorted by this same "interestingness." The search "HCI" is assigned a new color (as if it were a category), and each search hit is shown with that background color. The top of the screen now shows "HCI" as a "tab" next to the standard tabs for news categories. Katie decides that this is actually not a very interesting topic, and decides that she wants to look at health news. She clicks on the "health" tab, and sees the articles presented in the standard form. Except this time, one article is highlighted in two colors: both the Health color and the HCI color. She is intrigued, and hovers over it to read the synopsis to find news about a new regarding carpal tunnel syndrome. She reads the article, then goes back to the main interface to begin browsing from the main page again.

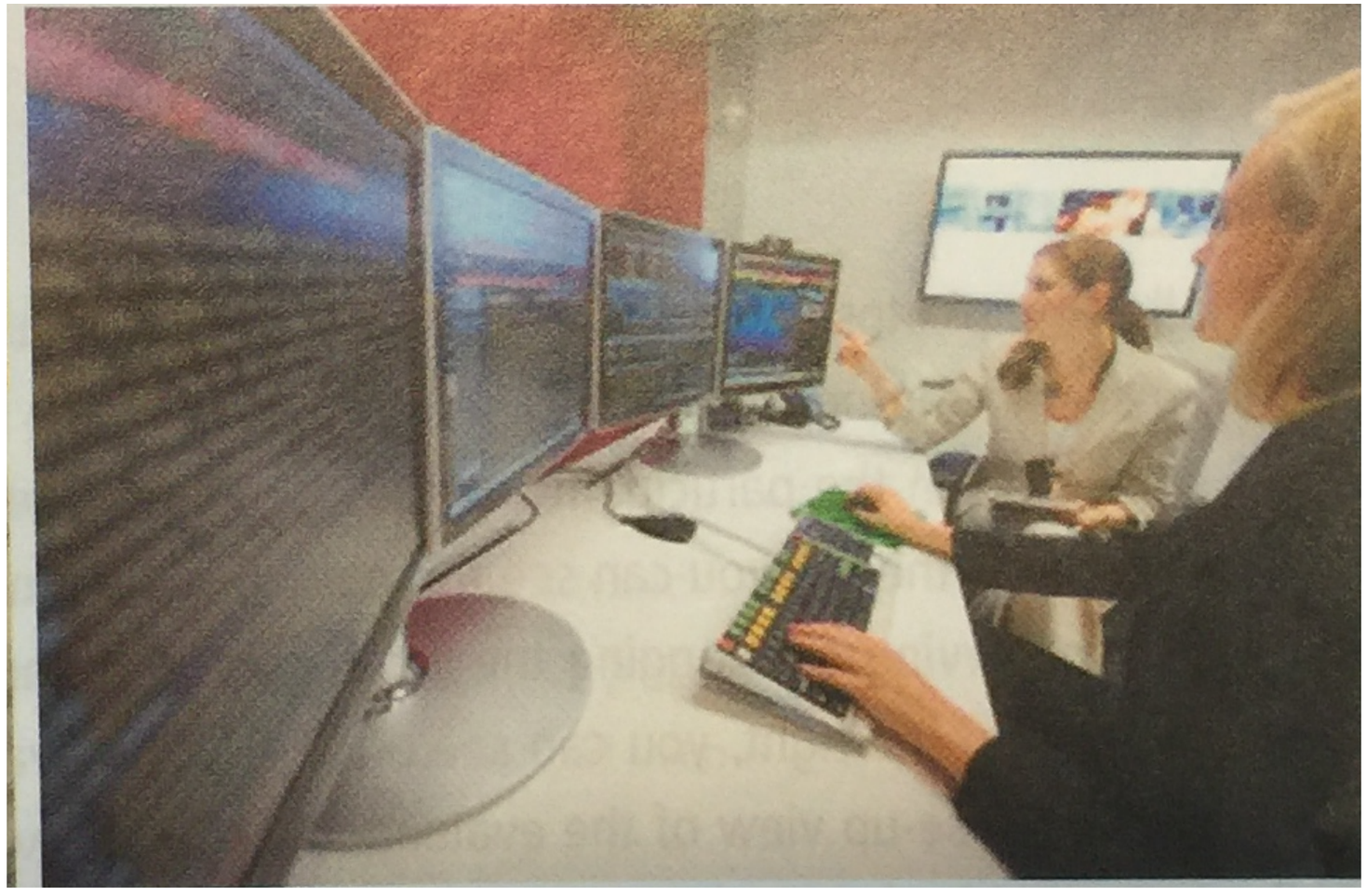
Checkpoint

Go to:
b.socrative.com, Click student login
Room name: SWE432
Student ID: Your G-number (Including the G)

Reminder: Survey can only be completed if you are in class. If you are not in class and do it you will be referred directly to the honor code board, no questions asked, no warning.

Why conduct usability studies

- Evaluate interaction design with **real** empirical data, gathering ground truth of user performance
- Identify **usability issues**



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

Study goals

- What usability 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
  - May line up with your personas?
- 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

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

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 or interview questions to gather participant feedback

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
  - Test data collection protocol and methods
- As-needed piloting
  - Use first study session as pilot only if issues arise and must be addressed

Conducting the study

Introduction

- Greet participants, introduce yourself, thank them
- Build rapport, socialize
- Introduce them to the setup
- 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*
- May sometimes be related to a gulf of execution or gulf of evaluation
- Generally does not include
  - accessing help
  - random acts of curiosity or exploration
  - slips

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)
- 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

Consolidating critical incidents

- Match similar critical incidents within and across study sessions
- Identify underlying cause
- Brainstorm potential fixes

Demo

https://www.youtube.com/watch?v=g34tOmyKaMM

Interactive Example

- How many students are registered for my Fall class, and how large is the wait list?

In class activity

Group activity

- Form groups of four
- Conduct a usability study of the reference MemeBase
  - 2 mins to brainstorm 1-2 min task
  - 2 mins to conduct study
  - Identify critical incidents (if any)