HCI: INTERVIEWS, FOCUS GROUPS, AND QUESTIONNAIRES

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First, the news...

<u>Outline</u>

- Qualitative data analysis, continued...
- Discount usability methods
- Think aloud

Quantitative vs Qualitative analysis

Quantitative

- Typically using numbers or clearly defined categories
- Examples: surveys, time measurements, activity order.
- Easies version is counting things
- Harder version involves statistics

Qualitative

- Data that cannot be trivially measured in a way that produces a number
- Interviews, focus groups, natural language
- Easy version is identifying themes or topics
- Harder version is grounded theory or qualitative coding

Qualitative Analysis

Qualitative Analysis

- Basic version (use for coursework)
 - Identify the main themes
 - Identify critical issues
- Professional version
 - Affinity Diagrams
 - AEIOU
 - Qualitative Coding
 - Thematic Analysis
 - Critical Incident Analysis
 - And many more...

Basic Qualitative Analysis

- Go back through the data (audio, video, notes, ect.) and look for patterns
 - Best to do this with raw data if possible, you often miss important things during the session itself
- What you are looking for depends on your research question
 - Opinions
 - Tasks
 - Past experiences
 - Times when things went wrong
- Identify themes
 - Write down the good and the bad things

This is a lite or easy version of "Open Coding" or "Thematic Analysis"

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Affinity diagram

PERMISSION PERMISSION PERMISSION UPDATE DEVICE MODIFY_AUDIO STATS SETTINGS USE SIP Allows an application to update device statistics. Allows an application to modify global audio settings. ALLOW TO APPS LIKE USE SKYPE WOULD NEED MICROPHONE TO USE YOUR HICROPHONE CONTEXT CONTEXT ON-CIKK PERMISSION PERMISSION RECORDING HANDLER ONCLICK_HANDLER ONTOUCH_HANDLER CAPTURE AUDIO RECORD_AUDIO AUDIO OUTPUT Handles Click events Handles Touch events. IN Allows an application to capture audio output. BACKGROUND Allows an application to record audio. Microphone DOING SOMETHING CLICK turned on RECORDING Voice Need to record voice. IN BACKGROUND Without a Button Push BUTTON WITHOUT EXPLICIT WITH INTENT MICROPHONE Chatting Talking Date Loughly in time in class makes noise Ginem. UST VOICE CHAT

Affinity diagram





<u>AEIOU</u>

AEIOU is an organizational framework which gives the researcher a set of concepts to step through when analyzing data

- Activities goal directed sets of actions
- Environments areas in which activities take place, atmosphere and function of the context
- Interactions between a person and someone or something else
- Objects items commonly found in the environment
- Users People who are present and what their roles and relationships might be

Qualitative Coding

- "Coding" is a social science term in which sections of qualitative data are labeled with "codes" which are similar to tags or categories
- Codes are either decided up-front or generated out of the data itself
- Pros
 - Grounded, strongly based on the data
 - Good way to see information in ways you don't expect
- Cons
 - Properly doing qualitative coding takes a long time
 - Requires multiple people to do the coding

Research Question: What factors do users consider when deciding to install updates or not?

Online survey

Respondents were asked to:

- 1. Relate a story
- 2. Is the story positive/negative/neither
- 3. Follow-up questions about the story
- 4. Relate a contrasting second story

Online survey

- 307 responses
- 592 usable stories
- First stories were:
 - 49% Negative
 - 29% Neutral
 - 21% Positive
- 133 Women, 174 Men
- Mean age 35

How did the experience make you feel?





Satisfied

Content coding

- Prior state
- Initiation
- Installer
- Expected installer
- Post state
- Expected post state
- Behavior
- Impact

- Installer
 - Time
 - Cost
 - Resources
 - Problems
 - Failure
 - Restart
 - Bundled software

"I decided that I wasn't going to install the update because I have heard all the reviews online about how it generally makes your phone slower in every respect."

Content coding

I decided that I wasn't going to install the update	Behavior : did not update
because I have heard all the reviews online	Behavior : research
about how it generally makes your phone slower in every respect	Expected post state : performance : worse

Thematic analysis

- Prior-state
- Initiation
- Installer
- Expected-Installer
- Post
- Expected-Post
- Behavior

Impact

- 1. Awareness
- 2. Deciding
- 3. Preparation
- 4. Installation
- 5. Troubleshooting
- 6. Post state

Discount Usability Methodologies

Discount Usability Methodologies

- In 1989 Jacob Nielsen wrote a paper entitled "Usability Engineering at a Discount"
- At the time, "correct" usability required an equiped lab and a large number of participants
- The idea: You can learn quiet a bit from small simple studies.
 - Simplified user testing small number of participants
 - Narrowed-down prototypes everything doesn't need to work, just the important bits
 - Heuristic evaluation inspect user interfaces based on established guild lines, no subjects needed

We are learning discount usability methods because:

- Most students in this class:
 - will not go on to become usability experts
 - will go on to design software used by humans
 - will be given very small budgets by their bosses to do usability work
 - if you do become usability specialists, odds are high you will not have a proper large team
- Discount usability methods are often based on more rigorous professional methods
 - Understanding them helps you learn more complex methodologies

Usability testing

- Involves recording performance of typical users doing typical tasks.
- Controlled settings.
- Users are observed and timed.
- Data is recorded on video & key presses are logged.
- The data is used to calculate performance times, and to identify & explain errors.
- User satisfaction is evaluated using questionnaires & interviews.
- Field observations may be used to provide contextual understanding.
 www.id-book.com

Usability testing & research

Usability testing

- Improve products
- Few participants
- Results inform design
- Usually not completely replicable
- Conditions controlled as much as possible
- Procedure planned
- Results reported to developers

Experiments for research

- Discover knowledge
- Many participants
- Results validated statistically
- Must be replicable
- Strongly controlled conditions
- Experimental design
- Scientific report to scientific community

Usability testing

- Goals & questions focus on how well users perform tasks with the product.
- Comparison of products or prototypes is common.
- Focus is on time to complete task & number & type of errors.
- Data collected by video & interaction logging.
- Testing is central.
- User satisfaction questionnaires & interviews provide data about users' opinions.

Testing conditions

- Usability lab or other controlled space.
- Emphasis on:
 - selecting representative users;
 - developing representative tasks.
- 5-10 users typically selected.
- Tasks usually around 30 minutes
- Test conditions are the same for every participant.
- Informed consent form explains procedures and deals with ethical issues.

Types of data

- Time to complete a task.
- Time to complete a task after a specified time away from the product.
- Number and type of errors per task.
- Number of errors per unit of time.
- Number of times online help and manuals accessed.
- Number of users making an error.
- Number of users successfully completing a task.

How many participants is enough for user testing?

- The number is a practical issue.
- Depends on:
 - schedule for testing;
 - availability of participants;
 - cost of running tests.
- Typically 5-10 participants.
- Some experts argue that testing should continue until no new insights are gained.

Portable equipment for use in the field



Figure 14.4 The Tracksys system being used with a mobile device camera that attaches to a flexible arm, which mounts on a mobile device, and is tethered to the lab *Source:* Courtesy of Harry Brignull.

Mobile head-mounted eye tracker



Figure 14.5 The mobile head-mounted eye-tracker Source: Picture courtesy of SensoMotoric Instruments (SMI), copyright 2010.

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Think Aloud

Think aloud

- Basic idea: Have a participant use the interface and speak aloud while they do so
- Think aloud is a very versatile, can be long or short, detailed or minimal, planned or ad-hoc

Pros

- Get a sense of what the user is trying to do and why they click on some things
- Testing with 5 users will find the majority of major issues

Cons

- Small sample sizes
- Talking aloud changes how long a user spends on tasks so this method cannot be combined with timing

Think aloud

- Think aloud sessions are typically scripted, that is, you write down everything you will say in advance
- Everything you say to the participant will change their behavior so you have to be very careful
- Typical session
 - Tell the participant what the session will involve including things like how long it will be and what kind of data recording you will be doing
 - 2. Train them in thinking aloud
 - 3. Ask them to accomplish several tasks which have been previously written down, reading aloud each task before starting it
 - End by thanking them and offering to answer any questions they may have

Usability testing the iPad

- 7 participants with 3+ months experience with iPhones
- Signed an informed consent form explaining:
 - what the participant would be asked to do;
 - the length of time needed for the study;
 - the compensation that would be offered for participating;
 - participants' right to withdraw from the study at any time;
 - a promise that the person's identity would not be disclosed; and
 - an agreement that the data collected would be confidential and would be available to only the evaluators
- Then they were asked to explore the iPad
- Next they were asked to perform randomly assigned specified tasks

<u>Think aloud</u> <u>training</u>

In this observation, we are interested in what you think about as you perform the tasks we are asking you to do. In order to do this, I am going to ask you to think aloud as you work on the task. What I mean by "think aloud" is that I want you to tell me everything you are thinking from the first time you see the statement of the task until you finish the task. I would like you to talk aloud constantly from the time I give you the task until you have completed it. I don't want you to try to plan out what you say or try to explain to me what you are saying. Just act as if you were alone, speaking to yourself. It is most important that you keep talking. If you are silent for any long period of time, I will ask you to talk. Do you understand what I want you to do?

Examples of the tasks

App or website	Task
iBook	Download a free copy of <i>Alice's Adventures in Wonderland</i> and read through the first few pages.
Craigslist	Find some free mulch for your garden.
eBay	You want to buy a new iPad on eBay. Find one that you could buy from a reputable seller.
Time Magazine	Browse through the magazine and find the best pictures of the week.
Epicurious	You want to make an apple pie for tonight. Find a recipe and see what you need to buy in order to prepare it.
Kayak	You are planning a trip to Death Valley in May this year. Find a hotel located in the park or close to the park.

Table 14.1 Examples of some of the tests used in the iPad evaluation (adapted from Budiu and Nielsen, 2010).

Source: Copyright Nielsen Norman Group, from report available at http://www.nngroup.com/reports/.

Questions?