Advanced Design of Interactive Systems

Lecture 2: Finding Out About Users

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Multi-Disciplinary Design Methods

Gathering information about users

More advanced techniques include:

- Cultural probe
- Technology probe
- User workshops
- Prototypes
- Log study
- Diary study
- Interactive thread
- Focus group
- Lab study

Users try objects that prompt reflection
Users use technology to reflect
Hands-on participatory design with users
Users test technology
Record users actions over time
Users record their own actions
Interact with users at an event
Ask customers about a product
Determine cause/effect relationships
Informed consent

Give participants enough information to make an informed decision whether or not to participate in the study.

| Purpose: | What is the study for? |
| Procedures: | What will they do and for how long? |
| Risks: | Should be ‘none’ |
| Benefits: | Who benefits and how? |
| Anonymity: | How will their identity be kept secret? |
| Compensation: | Often voluntary and unpaid |
| Withdrawal: | User may withdraw at any time without a reason |
| Approval: | If it has undergone IRB review |

Common sense when discussing user results

- Protect people’s privacy
- Don’t put their data out on the web…
- Don’t make people look foolish
  - No Youtube videos
- Educate the audience
  - Tell them how to view errors
- Summarize results fairly
  - Don’t over-emphasize your favorite issue
- Don’t change the intended use
  - No post-hoc marketing

Ethics … from different perspectives

Each profession has rules to protect someone … but not always the same person.

| Scientists | protect users / subjects |
| Journalists | public |
| Consultants | clients |
| Corporations | corporation |

Institutional Review Board (IRB)
- designed to protect participants in experiments
- Primarily in medical studies,
- but also when using technology
Does a project need an IRB review?

“Human subjects” are users or participants

NO

Project is Human Subject Research – you must submit protocol for IRB review

NO

Survey

NO

NO

Diary study

Milgram’s ‘Obedience to Authority’ experiment

Will ordinary people give a stranger a lethal electric shock in the name of science?

“Teachers” administer shocks to “students”

Start with a sample 45v shock

Paired-associate learning task
Diary studies

Ask users to keep a diary as they use the system to keep track of problems, successes, comments and suggestions.

Logging study - WM Lisa

Why do people abandon windows on their screens? From reminders to forgotten windows.

Logging study - WM Lisa

What is the lifetime of a window on the screen? Log state of every window over two weeks. Critical incident-style pop-up questions.

Figure 2. Piling up windows: the number of opened and abandoned windows per session increases with sessions between restarts.
Logging study - upgrades

How do people react to system upgrades?
Log user’s reactions over four weeks
Daily critical incident-style pop-up questions

Field experiments

Dan Russell (Google) creates huge controlled field experiments with a million subjects per condition

Example:
- Does the background color affect likelihood of buying? (Yes! 20% more with certain colors)

Obama’s campaign:
- Send different ads to randomly selected people
- Follow up calls: Which work best and on whom?

Discovered Republican women who were affected by national healthcare proposal
Controlled field study: PageLinker

Contextual bookmarks

Field experiment: PageLinker

4-week field experiment: ABAB within-subjects design
Scenarios with 5 search tasks:
Perform task 1, then 2 or 3, then 4 when tasks 1-3 complete.
Task 5 is independent of tasks 1-4.

Peer introspection exercise

Interview each other about the topic
Capture a story with critical incident or object questions
If possible, demonstrate using the system.

What breakdowns or problems did you experience?
How did you fix them?
Did you come up with successful workarounds?
**Take notes!**

**Interviewers:**
- Describe what happened,
- emphasize problems and surprises
- Summarize the key opportunities for design

**Interviewees:**
- Identify the three most important problems

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### Interviews vs. questionnaires

<table>
<thead>
<tr>
<th>Interviews</th>
<th>Questionnaires</th>
</tr>
</thead>
<tbody>
<tr>
<td>Few answers</td>
<td>Many answers</td>
</tr>
<tr>
<td>Can delve deeper to find out more</td>
<td>Difficult to ask follow-on questions</td>
</tr>
<tr>
<td>Analyze by hand</td>
<td>Automated analysis possible</td>
</tr>
</tbody>
</table>

**Advantages of interviews:**
- easier to get in-context information
- easier to get real-world stories
- easier to probe deeply into an interesting situation

**Advantages of questionnaires:**
- can ask lots of people
- simple questions are easy to tabulate
- often used for opinions

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**Questionnaires**

- background classification
- Likert scale
- multiple choice
daily use
- specific opinion
- short answer
- elaboration
- specific artifact
- specific time
- bright spot
- general opinion
- recommendations
- speculation
- open
- directed
- recent event
- critical incident
- specific time
- specific artifact
- bright spot
- general
- directed
- open
## Questionnaires

| Goal: Obtain data from a large number of users |
| Careful: Users are less likely to respond honestly |
| Questions may not really address the questions you think they are (external validity problem) |

## Design a questionnaire

| What information are you seeking? |
| Ask only what is necessary |
| Frame the questions correctly |
| Who is the audience? |
| 50 - 1000 users … or more? |
| How will you send your survey? |
| Most often with a survey web app |
| But sometimes paper is better |
| How will you analyze your results? |
| Consider the statistical analysis first |

## Question styles

### Background
- Age, profession, years in the job

### General information
- How many years have you used this email system?

### Directed questions
- How many messages did you receive yesterday?

### Multiple choice
- I move messages to project folders
  - never
  - rarely
  - often
  - always

### Scalaire
- I can easily manage my email
  - Strongly
  - Strongly Agree
  - Strongly Disagree

### Ranking
- Rank the following functions in order of usefulness
  - Blind copy
  - Automatic copy to a distribution list
  - Automatique to myself

### Open questions
- Describe how you use electronic mail.
### Principles for designing questions

- Use parallel structure for sentences
- Keep the order coherent, e.g. positive to negative
- Zero can mean two things: neutral, middle response or “I do not know”
- Consider adding a degree of confidence
- Avoid asking ‘obvious’ questions
- Ask the same question in two different ways to see if you get the same result

### One more reminder

- Directed, specific questions are easiest to code and belong at the beginning of the questionnaire provide the fewest interesting results
- Open, general questions are very difficult to code and analyze but may provide very interesting responses but also risk giving stereotypical responses

### Design vs. Marketing questionnaires

- Designers need facts to inform the design: examples of problems, stories about events, data about use
- Marketing wants opinions: what people like and do not like, what they think they want
- Emphasize facts first, then opinions: Directed questions (specific or open-ended) often elicit facts General questions (specific or open-ended) often lead to opinions

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**Homework**
For Monday, 10 February

Each group should have:
- Set up your group’s Web page
- Conducted (at least) 8 story interviews*
- Collect other types of user information, either from your “client” groups or other users
- Come up with initial ideas for your project

* Interviews are graded individually