

Chapter 14:

Usability testing and field studies



The aims:

- Explain how to do usability testing through examples.
- Outline the basics of experimental design.
- Discuss the methods used in usability testing.
- Discuss the role of field studies in evaluation.

Usability testing

- Involves recording performance of typical users doing typical tasks.
- Controlled environmental 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.

Experiments & usability testing

- Experiments test hypotheses to discover new knowledge by investigating the relationship between two or more things – i.e., variables.
- Usability testing is applied experimentation.
- Developers check that the system is usable by the intended user population for their tasks.
- Experiments may also be done in usability testing.

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 reported to scientific community

Usability testing

- Goals & questions focus on how well users perform tasks with the product.
- Comparison of products or prototypes 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.

Usability lab with observers watching a user & assistant



Portable equipment for use in the field



A selected group of panelists are invited to participate



...They are asked to evaluate the web from their natural context, using Internet Explorer



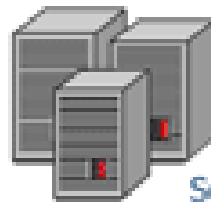
...A robot (UZ Bar) guides the users and monitors their behavior



Remote Usability Testing



The data is analysed and a final report is prepared



Servidores
UserZoom

The UZ Platform gathers and saves the data in real-time



The users are asked to complete certain tasks and answer questions

Testing conditions

- Usability lab or other controlled space.
- Emphasis on:
 - selecting representative users;
 - developing representative tasks.
- 5-10 users typically selected.
- Tasks usually last no more than 30 minutes.
- The test conditions should be the same for every participant.
- Informed consent form explains procedures and deals with ethical issues.

Some type 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 navigations to online help or manuals.
- Number of users making a particular error.
- Number of users completing task successfully.

Usability engineering orientation

- Aim is improvement with each version.
- Current level of performance.
- Minimum acceptable level of performance.
- Target level of performance.

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.

MedlinePlus.com

- Explore Medlineplus.
- Develop 2 tasks that are not described in the book.
- Decide what data you will collect.
- Run a test with two participants.
- Collect, analyze, present & comment on your data.



Experiments

- Predict the relationship between two or more variables.
- Independent variable is manipulated by the researcher.
- Dependent variable depends on the independent variable.
- Typical experimental designs have one or two independent variable.

Experimental designs

- Different participants - single group of participants is allocated randomly to the experimental conditions.
- Same participants - all participants appear in both conditions.
- Matched participants - participants are matched in pairs, e.g., based on expertise, gender, etc.

Different, same, matched participant design

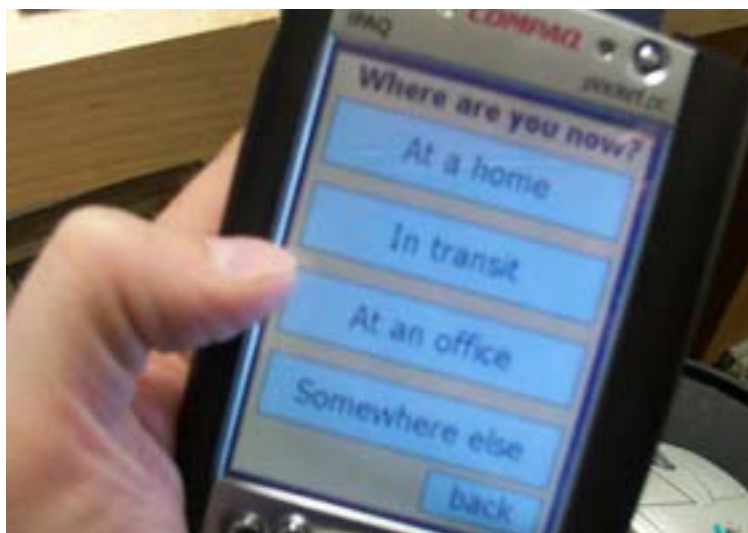
Design	Advantages	Disadvantages
Different	No order effects	Many subjects & individual differences a problem
Same	Few individuals, no individual differences	Counter-balancing needed because of ordering effects
Matched	Same as different participants but individual differences reduced	Cannot be sure of perfect matching on all differences

Field studies

- Field studies are done in natural settings.
- The aim is to understand what users do naturally and how technology impacts them.
- Field studies can be used in product design to:
 - identify opportunities for new technology;
 - determine design requirements;
 - decide how best to introduce new technology;
 - evaluate technology in use.

Data collection & analysis

- Observation & interviews
 - Notes, pictures, recordings
 - Video
 - Logging
- Analyzes
 - Categorized
 - Categories can be provided by theory
 - Grounded theory
 - Activity theory



What were you doing at the beep?

☐ Preparing lunch

☐ Watching TV

☐ Getting ready for work

☐ Sleeping



Answers 1-4 of 12



Example of categories from Activity Theory

where-to artefacts

The cinema experience as it is formed in the shop, in sales brochures, and at Sarah's sister's house.

why artefacts

Press number button for number of loudspeakers to be connected.

how artefacts

Press LIFT [LIST] button a few times.

what artefacts

The electronic curtains rising and falling.

Key points

- Testing is a central part of usability testing.
- Usability testing is done in controlled conditions.
- Usability testing is an adapted form of experimentation.
- Experiments aim to test hypotheses by manipulating certain variables while keeping others constant.
- The experimenter controls the independent variable(s) but not the dependent variable(s).
- There are three types of experimental design: different-participants, same-participants, & matched participants.
- Field studies are done in natural environments.
- Typically observation and interviews are used to collect field studies data.
- Categorization and theory-based techniques are used to analyze the data.