

Human-Computer Interaction

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Evaluation Techniques-2

Evaluation through user participation

- Some of the techniques we have considered so far concentrate on evaluating a design or system **through analysis by the designer, or an expert evaluator**, rather than testing with actual users.
- **User participation** in evaluation tends to occur in the **later stages** of development when there is **at least a working prototype** of the system in place.

Evaluation through User Participation

- Styles of evaluation
 - **Laboratory studies**; take part in controlled tests
 - **Field studies**; into the user's work environment in order to observe the system in action

Laboratory Studies

- In the first type of evaluation studies, **users are taken out of their normal work environment to take part in controlled tests**, often in a specialist usability laboratory.
- This approach has a number of **benefits and disadvantages**.
- A well equipped usability laboratory may **contain sophisticated audio/visual recording and analysis facilities**.

Laboratory Studies (Cont.)

- There are some situations where laboratory observation is the only option.
 - e.g. if the system is to be **located in a dangerous or remote** location, such as a space station.
 - Some **very constrained single user** tasks may be adequately performed in a laboratory.
 - Want **to manipulate the context** in order to uncover problems or observe less used procedures.
 - Want to **compare alternative designs** within a controlled context.

Field Studies

- The second type of evaluation takes the designer or evaluator out into the user's work environment in order to observe the system in action.
- High levels of ambient noise, greater levels of movement and constant interruptions, such as phone calls, all make field observation difficult.

Field studies (Cont.)

- The very **'open'** nature of this situation means that you will **observe interactions between systems and between individuals** that would have been missed in a laboratory study.
- The context is retained and you are seeing the user in his **'natural environment'**.

Elements of Evaluation:

Observe, listen, compare, measure

- Observe
 - Most evaluation include some type of observation
 - Observing user during user actions
 - Inspectors keeping track of their own actions while inspecting the user interface
- Compare
 - Compare UI with standard of excellence or good practice
 - List of requirements or innate sense of good interface
- Listen
 - Listen to what users and inspectors have to say about usability of UI design
 - Listening can be informal: Asking someone's opinions
 - Formal: Audio and video recordings

Observe, listen, compare, measure: Elements of evaluation (cont'd)

- Measure

- Not only find out if UI is good or bad but

- How good or how bad

- Implies some number or measures

- Measuring implies obtaining quantitative data during evaluations to validate usability requirements
- E.g. Aim to validate usability metric “time taken to complete tasks” or “number of errors made”

Element	Available choices
Observe	Direct observation Indirection observation - Video recordings, through one way mirror, eye-tracking, software over the Internet, retrospective protocol
Compare	User personal concept of what constitute a good interface Design principles, guidelines, usability standards, customised style guide
Listen	Think aloud protocols, cognitive walkthrough questions, Post-session interview, retrospective protocols, asking user's opinions, questionnaires
Measure	Post-session questionnaires (to measure satisfaction) Measure whether interface allowed user to complete task successfully Measure time taken to do task Measure metrics

Type of Data to Collect

- Must identify type of evaluation data to help you explore the usability requirements
- Quantitative data
 - Any type of numeric data derived from taking measurements; time take to complete task
- Qualitative data
 - Data without a numeric content

Introduction

- Who? - Choosing your users
- When? - Creating a timetable
- What? - Preparing task descriptions
- Where? - Deciding where to do evaluation

Choosing your Users

- To get variety of views
 - Session is repeated
- Sometimes **5 participants** is sufficient
- Why is it important to include a usability expert?
Overall aim to ensure that real users can use the system
not usability experts approve of it
- Points to consider
 - Who is a real user?
 - One participant at a time or work in pairs?
 - How many participant do you need?

Who is a Real User?

- E.g Public information kiosk
 - Actual users general public, including tourists who do not speak Urdu
 - Participants in evaluation
 - Actual users, all whom speak Urdu for first round
 - Non-Urdu speaking users for second round

Who is a Real User (cont' d)?

- Depending on circumstance
 - Choice of users could be narrower than actual real users
 - Or better to choose a different user group
- Aim in recruiting participants is to find
 - Participants who reflect
 - **Different skills**
 - **Domain knowledge**
 - **System experience of users described during requirements gathering**
- Recruit whoever is available and ask background and skills

Users Working alone or in Pairs

- User observation is usually based on a single user working alone
- In situations
 - Users usually work cooperatively
 - Cultural constraints make it difficult for users to be critical
 - Observe users prefer to work in pairs
- Helper** or user advocate work alongside participant
 - Users are children
 - Participant speaks a language other than one you understand, you will need an interpreter.
 - Participant has a speech impairment or learning or cognitive disability, which affects speech or understanding
- EVALUATION TIP**
 - Speak to the participant **NOT** the interpreter (not to intermediary)

Number of Participants

- Only need a **few**, at the early stage of development of interface
- Want to find problems
 - Frustrating when participants find the same problem
- **Failure** to find problems **does not imply** interface is **usable**
- Number of participants required
 - Is **5 sufficient**? How do you know?
 - Yeo, A.W. 2004. Determining the Efficacy of Imported Usability Assessment Tools in Asia. *Proceedings of 7th International Work with Computing Systems Conference*. (Kuala Lumpur, Malaysia, Jun 29 – July 2).

- Recruiting **extra** participants
 - ▣ In case fails to turn up
 - ▣ Recruit **floaters**
 - ▣ Recruit **9 respondents for six user observations**
- Ideas for participants
 - ▣ **Colleagues** (un)familiar with system, family members or friends, real users,
 - ▣ Advantages and disadvantages
- Offering **incentives**
 - ▣ Should ordinarily be compensated
 - ▣ Letter of thanks, confirm confidentiality of evaluation and use you will make of data; Thank you to managers (if users are colleagues)
 - ▣ Token gift, potted plant, plan to offer food, chocolates
 - ▣ Be wary of culture and views of organisation

- **Recruiting screeners and pretest questionnaires**
 - **Recruitment screener**
 - A list of questions to ask each potential participant to assess whether or not the person will be suitable
 - **When participant arrives, repeat questions**
 - **May ask other questions related to domain of UI**

Creating a Timetable

- How long do you need?
- How much time will whole process take?
- Decide duration of evaluation session
 - Aim to last 30 – 90 minutes
 - Allow time for greeting and explanation before task and finishing up with final questions
 - Longer sessions can tire up participant and evaluators, evaluation less effective
 - **EVALUATION TIP 2**
 - **Make sure participants know to ask for break if feeling tired or for any other reason**
 - Need time to tidy up in between

Timings of a day's Evaluation Session

830		Everything in place
9	First participant	
1030		Tidying up
11	Second	
1230		Tidying up lunch break
1	Third	
230		Tidying up
3	Fourth	
430		Tidying up
5	Fifth, final	
630		Tidy up and finish

Time Table for a Week

Monday	8 hrs	Evaluation sessions
Tuesday	8 hrs	Evaluation sessions
Wednesday	8 hrs	First part of analysis
Thursday	2 6 hrs	Final analysis Start to write report
Friday	4 hrs	Finish report
	4 hrs	Prepare and present at meeting

Overall evaluation timetable

Week 1	Create evaluation strategy Decide who to recruit Start preparing evaluation materials Run Pilot test
Week 2	Recruit participant
Week 3	Finalize evaluation materials
Week 4	Evaluation week

- **EVALUATION TIP 3**

- *Draw up timetable early*
- *Notice required for recruits*
- *Coordinate time developers or time on specific equipment*
- *Sooner create timetable, easier to keep track*

Arranging usability evaluation sessions

- Create a checklists
 - Scheduling suitable dates and times
 - Planning travel and researching equipment for session
 - Reserving a room if you are undertaking an informal controlled study
 - Booking a usability laboratory for formal controlled study
 - Information all evaluators and participants concerned with arrangement details

Constraints that Evaluation Strategy may have?

- Evaluation strategy will be affected by constraints such as:
 - Money
 - Timescales
 - Availability of usability equipment
 - Availability of participants and costs of recruiting them
 - Availability of evaluators
- Time schedule is tight, less time to apply evaluation techniques

Summary

- What is the purpose of this evaluation?
- Which users will you choose?
- Where will you do the evaluation?
- What type of data do you need to collect?
- What product, system, are you testing?
- What tasks will you ask the participants to try?
- What constraints do I have?



Q & A



Thank you
for your attention