Human-Computer Interface

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Today's Topics

- Introducing evaluation
- A evaluation framework

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- ***Introducing evaluation***
- A evaluation framework

4Ws of evaluation

- Iterative design & evaluation is a continuous process that examines:
  - Why
    - to check users' requirements and that users can use the product and they like it.
  - What
    - a conceptual model, early prototypes of a new system and later, more complete prototypes.
  - Where
    - in natural and laboratory settings.
  - When
    - throughout design; finished products can be evaluated to collect information to inform new products.

Evaluation is necessary

- *"Iterative design, with its repeating cycle of design and testing, is the only validated methodology in existence that will consistently produce successful results. If you don't have user-testing as an integral part of your design process you are going to throw buckets of money down the drain."*

  -- Bruce Tognazzini

- See AskTog.com for topical discussions about design and evaluation.

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Types of evaluation

- Controlled settings (实验测试)
  - involving users
    - usability testing & experiments in laboratories and living labs
- Natural settings (实地研究)
  - involving users
    - field studies to see how the product is used in the real world.
- Any settings (启发式评估)
  - not involving users
    - consultants critique, to predict, analyze & model aspects of the interface analytics.

Example: Usability lab

http://iat.ubalt.edu/usability_lab/

Example: Living labs

- People's use of technology in their everyday lives can be evaluated in living labs.

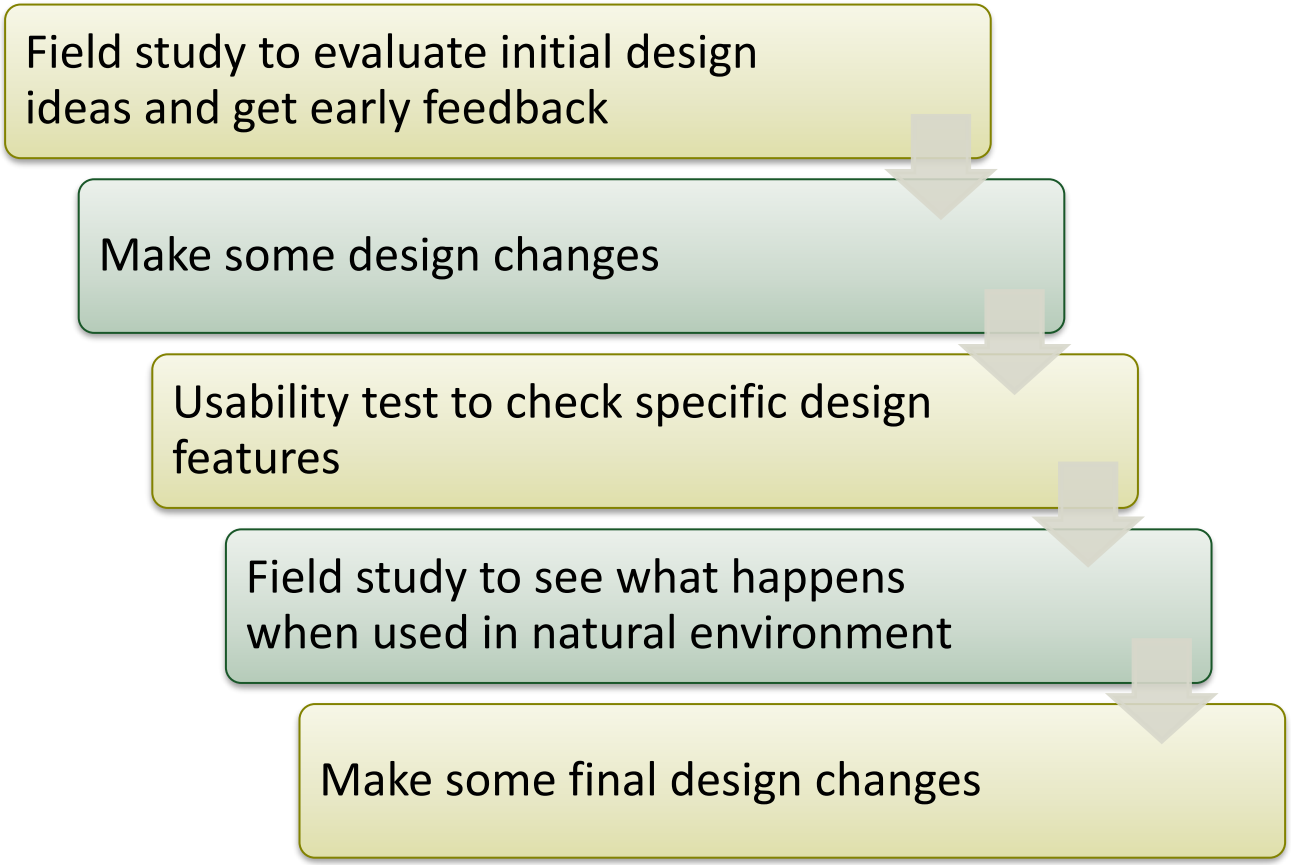
- Such evaluations are too difficult to do in a usability lab.
  - E.g.: the Aware Home was embedded with a complex network of sensors and audio/video recording devices (Abowd et al., 2000).

Evaluation methods

method	Controlled settings	Natural settings	Without users
Observing	O	O	
Asking users	O	O	
Asking experts		O	O
Testing	O		
Modeling			O

Usability testing Vs. field studies

- Usability testing & field studies can compliment



The language of evaluation

- Analytics
- Analytical evaluation
- Controlled experiment
- Expert review or crit
- Field study
- Formative evaluation
- Heuristic evaluation
- In the wild evaluation
- Living laboratory
- Predictive evaluation
- Summative evaluation
- Usability laboratory
- User studies
- Usability testing
- Users or participants

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DECIDE: a framework to guide evaluation

- *D*etermine the *goals*.
- *E*xplore the *questions*.
- *C*hoose the evaluation *methods*.
- *I*dentify the *practical issues*.
- *D*ecide how to deal with the *ethical issues*.
- *E*valuate, analyze, interpret and present the *data*.

*D*etermine the goals

- What are the high-level goals of the evaluation?
- Who wants it and why?
- The goals influence the methods used for the study.

- Example
  - Goals vary and could be to
    - identify the best metaphor for the design
    - check that user requirements are met
    - check for consistency
    - investigate how technology affects working practices improve the usability of an existing product

*E*xplore the questions

- Questions help to guide the evaluation.

- Example
  - The goal of finding out why some customers prefer to purchase paper airline tickets rather than e-tickets can be broken down into sub-questions:
    - What are customers' attitudes to e-tickets?
    - Are they concerned about security?
    - Is the interface for obtaining them poor?
  - What questions might you ask about the design of a cell phone?

Choose the evaluation methods

- The evaluation method influences how data is collected, analyzed and presented.

- Example
  - field studies typically
    - Involve observation and interviews.
    - Involve users in natural settings.
    - Do not involve controlled tests.
    - Produce qualitative data.

Identify practical issues

- Select users
- Find evaluators
- Select equipment
- Stay on budget
- Stay on schedule
- ……

*D*ecide about ethical issues

- Develop an informed consent form

- Participants have a right to
  - Know the goals of the study
  - Know what will happen to the findings
  - Privacy of personal information
  - Leave when they wish
  - Be treated politely

Evaluate, interpret & present data

- Methods used influence how data is evaluated, interpreted and presented
- The following need to be considered
  - Reliability
    - can the study be replicated?
  - Validity
    - is it measuring what you expected?
  - Biases
    - is the process creating biases?
  - Scope
    - can the findings be generalized?
  - Ecological validity
    - is the environment influencing the findings?
    - i.e. Hawthorn effect. (霍桑效应)

Summary

- Evaluation & design are closely integrated in user-centered design
  - Three types of evaluation: laboratory based with users, in the field with users, studies that do not involve users
  - The main methods are: observing, asking users, asking experts, user testing, inspection, and modeling users' task performance, analytics.
- Many issues to consider before conducting an evaluation study
  - The DECIDE framework provides a useful checklist for planning an evaluation study

Final Presentation

- Team introduction
  - Division of work
  - How about contributions?
- About your project
  - Background and motivation
  - Related work
  - Your goals
  - How you achieve the goals?
    - Conceptual design
    - Physical design
  - Results and Demo (Encouraged)
  - Evaluation

Thank you for your attention!