Usability evaluation and testing

User interfaces

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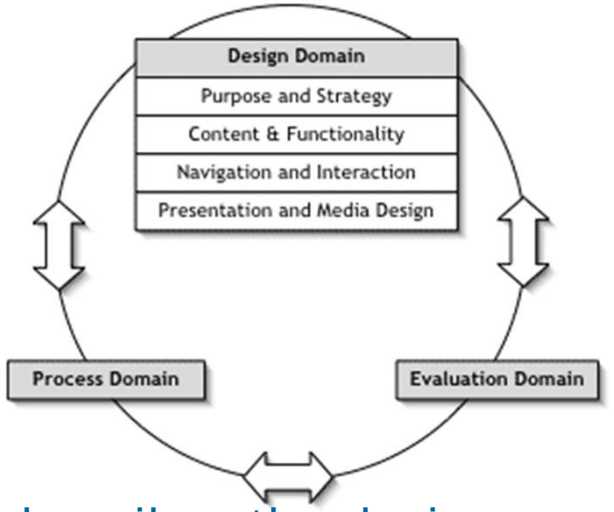
Methods for usability evaluation

- Wide variety of methods, often ad-hoc testing (not too systematic)
- More than one approach may be needed
  - one test cannot find all problems
  - One evaluator cannot see all aspects
- Consult standards!

Usability standards

- The ISO 23973 Reference Model



- The process domain. This domain describes the design process used by the organisation, such as the one described in ISO 13407:1999 Human-centred design processes for interactive systems.
- The evaluation domain. This domain contains the tools and techniques used to assess the final design, such as usability testing.
- The design domain. This is the domain within which the designer develops the web site.

Usability heuristics in ISO 9241-110 standard

- User interface evaluation
- Ergonomics of human system interaction -
  Part 110: Dialogue principles.

Dialogue principles

- Is the dialogue suitable for the user's task and skill level? (Suitability for the task)

  A dialogue is suitable for a task when it supports the user in the effective and efficient completion of the task. In a dialogue which is suitable for the task, the user is enabled to focus on the task itself rather than the technology chosen to perform that task.

- Does the dialogue make it clear what the user should do next?
  (Self-descriptiveness)

  A dialogue is self-descriptive to the extent that at any time it is obvious to the users which dialogue they are in, where they are within the dialogue, which actions can be taken and how they can be performed.

Dialogue principles 2

- Is the dialogue consistent?
  (Conformity with user expectations)
  A dialogue conforms with user expectations if it corresponds to predictable contextual needs of the user and to commonly accepted conventions.

- Does the dialogue support learning? (Suitability for learning)
  A dialogue is suitable for learning when it supports and guides the user in learning to use the system.

- Can the user control the pace and sequence of the interaction? (Controllability)
  A dialogue is controllable when the user is able to initiate and control the direction and pace of the interaction until the point at which the goal has been met.

Dialogue principles 3

- Is the dialogue forgiving?
  (Error tolerance)
  A dialogue is error-tolerant if, despite evident errors in input, the intended result may be achieved with either no or minimal corrective action by the user. Error tolerance is achieved by means of damage control, error correction, or error management to cope with errors that occur.

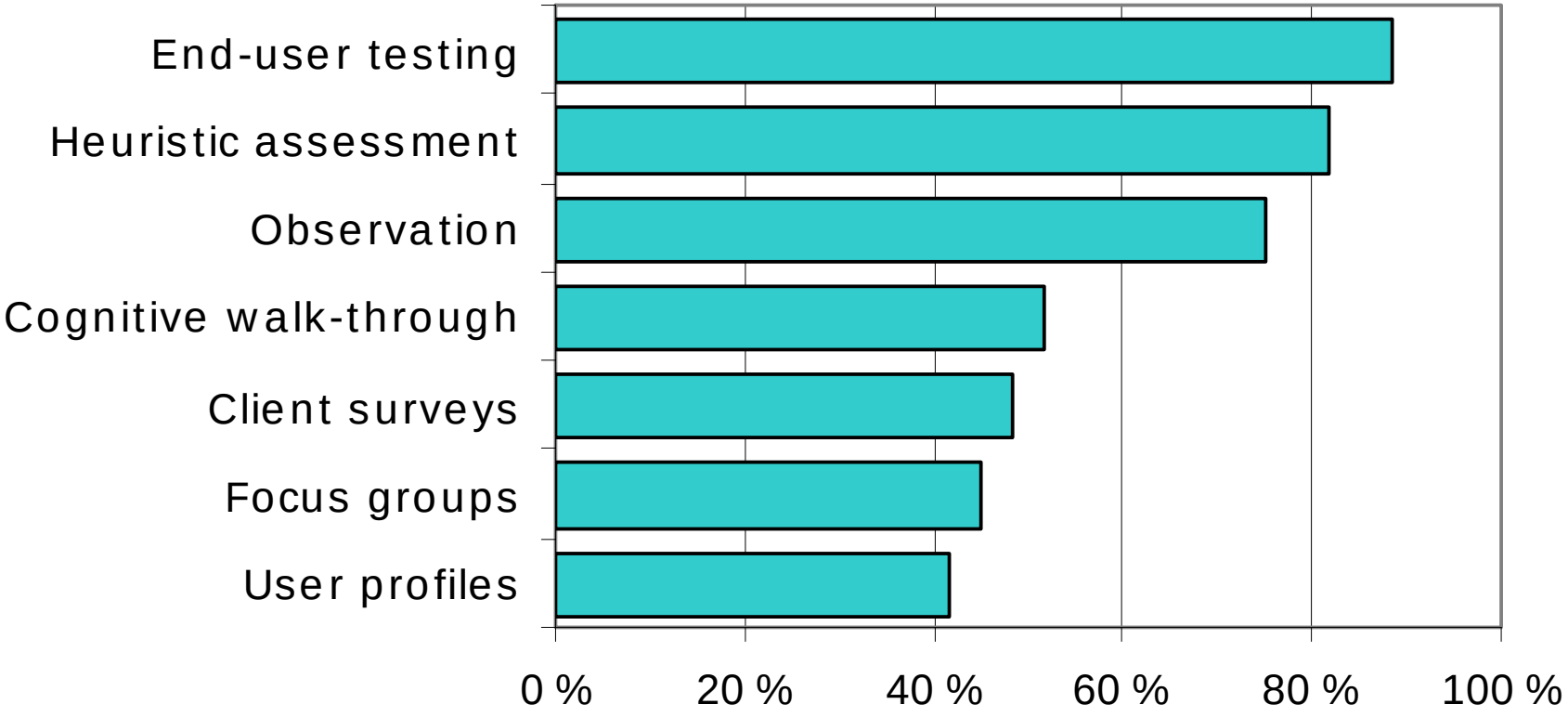
- Can the dialogue be customised to suit the user?
  (Suitability for individualisation)
  A dialogue is capable of individualization when users can modify interaction and presentation of information to suit their individual capabilities and needs.

Methods, categories

Cognitive Modeling	17
Conceptual Design	22
Empirical Methods	34
Inquiry	16
Needs Analysis	8
Project Management	27
Prototyping	20
Usability Evaluation	46

http://www.usabilityfirst.com/glossary/cat_15.txl

Usability evaluation methods used in Finland



Methods

- End-user testing
- Upgraded Nielsen heuristics
- Cognitive walk-through
- Situation analysis – use cases

End-user testing

- Test subject belongs to the target group
- Genuine tasks
- Video-taping of tests or
- Eye-tracking
- Result analysis
  - Classification of errors according to seriousness
- Test report

Classes of design errors

1. Local mistake
2. Systematic error
3. Fixing would need redesign
4. Fixing needs use case analysis

Strenghts and weaknesses

- Strenghts
  - Gives understanding of real use situations
  - Finds critical usability problems
  - Genuine user views
  - Credibility of results
- Weaknesses
  - Demanding and expensive:
  - Planning, implementation and analysis
  - Real users needed

A Usability problem exists if

- Test person
  - Proposed improvement to the system
  - Got confused
  - Tried to find solution more than three times
  - It took over 3 minutes to reach the goal
  - Gave up!
- System failure

Nielsen heuristics

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

http://www.useit.com/papers/heuristic/heuristic_list.html

Addition to the Nielsen heuristics

11. Respect for user and user needs
12. Pleasant product use experience
13. Support for quality standards
14. User privacy protection

Heuristic assessment 1/2

- 3-5 evaluators
  - Experts of the application area and usability
- Independent learning of the application
- Discussion on findings
- 1-2 hours

Heuristic assessment 2/2

- Note each problem separately
  - problem
  - Use case
  - What heuristic category is violated
  - Fixing proposal
  - Classification of seriousness
    - Regularity, effects, permanence
- Also good sides of the design

Classification of problem seriousness

1. Not a problem
2. Cosmetic problem
3. Minor usability problem
4. Major usability problem
5. Catastrophic usability problem

Strenghts and weaknesses

- Strenghts
  - Cheap, fast, intuitive and can be applied in many situations
  - Good for fixing easy problems
- Weaknesses
  - User interaction observation is not caught
  - Hard to find really fatal problems

Cognitive Walkthrough Method

Questions:

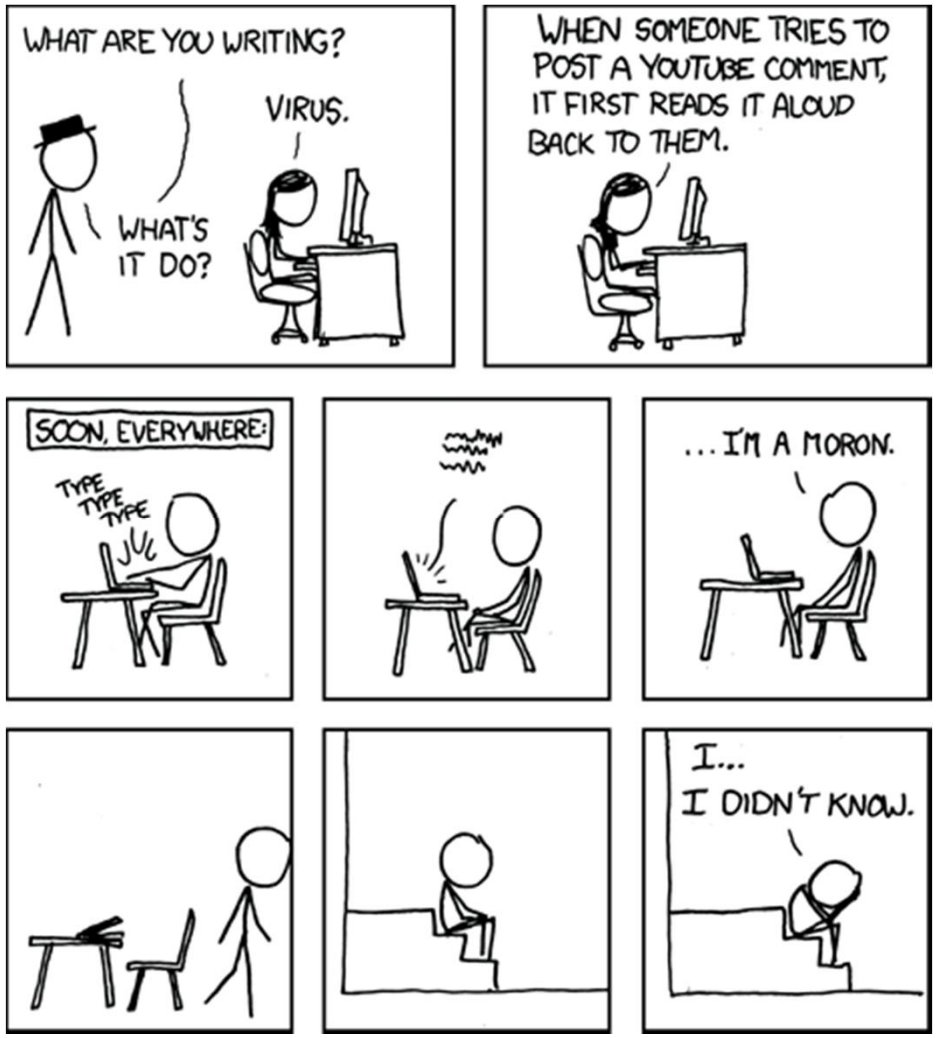
1. Is the user goal right for the user interface?
2. Can the user find the right function?
3. Can the user connect her goal to the function?
4. When the task is completed, does the feedback indicate that user has proceeded in the right direction?

Situation: use case

- A familiar and genuine work place
- Interviews with users and observations
- A well-defined subject
- The user is the expert – the researcher is an apprentice

Polite applications

- *People tend to humanize computers (Reeves & Nass 1996)*
- People attribute intentions and attitudes to computer systems
- Computer messages display programmer attitudes!



http://xkcd.com

Polite applications

- A polite application is
  - Easy to approach
  - Ready to fill user needs
  - Good information
  - Is not confused and sticks to the task
  - Does not bother users with its own problems
  - Reliable