

# Lecture

# Human Computer Interaction

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# Chapter 6

## Evaluation

(selected topics)

- Heuristic Evaluation

# What to evaluate?

- The usability of a system!
  
- ... it depends on the stage of a project
  - Ideas and concepts
  - Designs
  - Prototypes
  - Implementations
  - Products in use
  
- ... it also depends on the goals
  
- Approaches
  - Formative evaluation – throughout the design, helps to shape a product
  - Summative evaluation – quality assurance of the finished product.

# Why evaluate?

## Goals of user interface evaluation

- Ensure functionality (effectiveness)
  - Assess (proof) that a certain task can be performed
- Ensure performance (efficiency)
  - Assess (proof) that a certain task can be performed given specific limitations (e.g. time, resources)
- Customer / User acceptance
  - What is the effect on the user?
  - Are the expectations met?
- Identify problems
  - For specific tasks
  - For specific users
- Improve development life-cycle
- Secure the investment (don't develop a product that can only be used by fraction of the target group – or not at all!)

# There is not a single way ...

- Different approaches
  - Inspections
  - Model extraction
  - Controlled studies
  - Experiments
  - Observations
  - Field trails
  - Usage context
  
- Different results
  - Qualitative assessment
  - Quantitative assessment

# Usability Methods are often not used!

## ■ Why

- Developers are not aware of it
- The expertise to do evaluation is not available
- People don't know about the range of methods available
- Certain methods are too expensive for a project (or people think they are too expensive)
- Developers see no need because the product “works”
- Teams think their informal methods are good enough

## ■ starting points

- Discount Usability Engineering  
[http://www.useit.com/papers/guerrilla\\_hci.html](http://www.useit.com/papers/guerrilla_hci.html)
- Heuristic Evaluation  
<http://www.useit.com/papers/heuristic/>



# Inspections & Expert Review

- Throughout the development process
- Performed by developers and experts
- External or internal experts
- Tool for finding problems
- May take between an hour and a week
- Structured approach is advisable
  - reviewers should be able to communicate all their issues (without hurting the team)
  - reviews must not be offensive for developers / designers
  - the main purpose is finding problems
  - solutions may be suggested but decisions are up to the team

# Inspection and Expert Review Methods

- Guideline review
  - Check that the UI is according to a given set of guidelines
- Consistency inspection
  - Check that the UI is consistent (in itself, within a set of related applications, with the OS)
  - Birds's eye view can help (e.g. printout of a web site and put it up on the wall)
  - Consistency can be enforced by design (e.g. css on the web)
- Walkthrough
  - Performing specific tasks (as the user would do them)
- Heuristic evaluation
  - Check that the UI violates a set (usually less than 10 point) rules

# Informal Evaluation

- Expert reviews and inspections are often done informally
  - UIs and interaction is discussed with colleagues
  - People are asked to comment, report problems, and suggest additions
  - Experts (often within the team) assess the UI for conformance with guidelines and consistency
- Results of informal reviews and inspections are often directly used to change the product
- ... still state of the art in many companies!
- Informal evaluation is important but in most cases not enough
  
- Making evaluation more explicit and documenting the findings can increase the quality significantly
- Expert reviews and inspections are a starting point for change

# Discount Usability Engineering

- Low cost approach
- Small number of subjects
- Approximate
  - Get indications and hints
  - Find major problems
  - Discover many issues (minor problems)
- Qualitative approach
  - observe user interactions
  - user explanations and opinions
  - anecdotes, transcripts, problem areas, ...
- Quantitative approach
  - count, log, measure something of interest in user actions
  - speed, error rate, counts of activities

# Heuristic Evaluation

<http://www.useit.com/papers/heuristic/>

- Heuristic evaluation is a usability inspection method
- systematic inspection of a user interface design for usability
- goal of heuristic evaluation
  - to find the usability problems in the design
- As part of an iterative design process.
  
- Basic Idea:  
*Small set of evaluators examine the interface and judge its compliance with recognized usability principles (the "heuristics").*

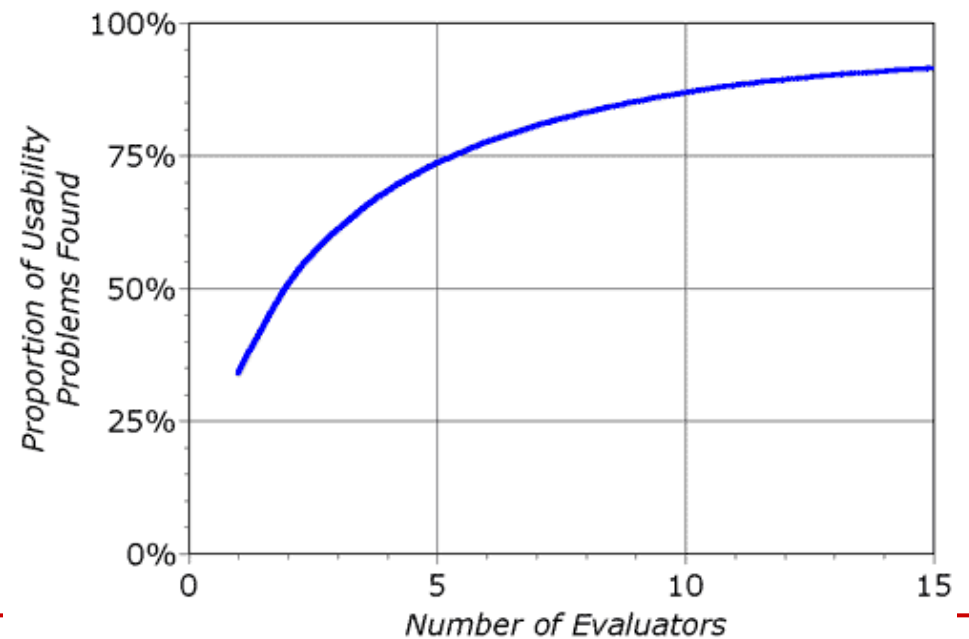
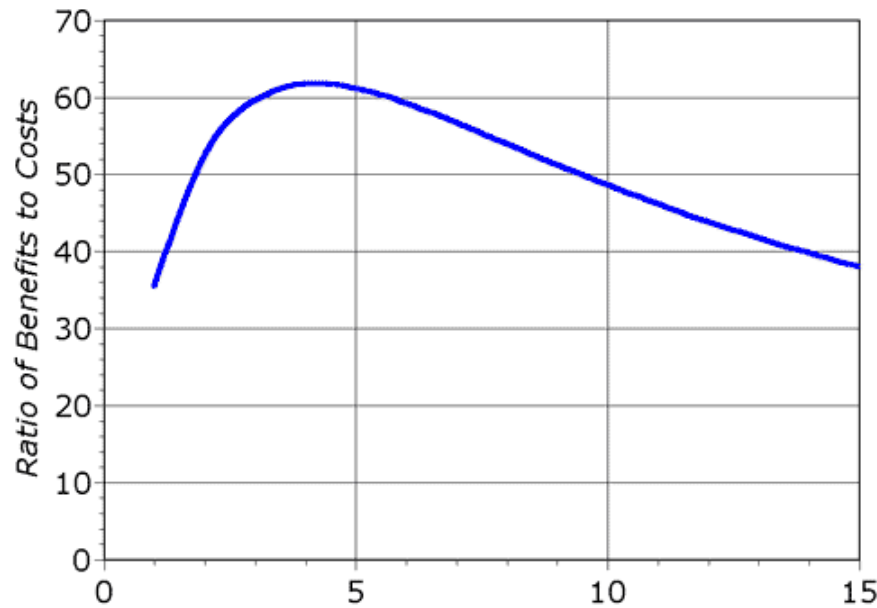
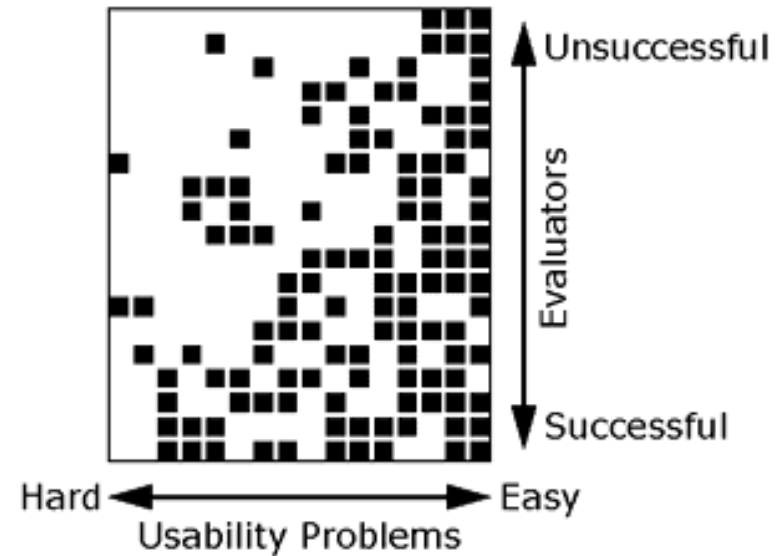


# Heuristic Evaluation

<http://www.useit.com/papers/heuristic/>

- How many evaluators?
- Example: total cost estimate with 11 evaluators at about 105 hours, see

[http://www.useit.com/papers/guerrilla\\_hci.html](http://www.useit.com/papers/guerrilla_hci.html)



# Heuristic Evaluation - Heuristics

- Heuristics suggested by Nielsen
  - Visibility of system status
  - Match between system and the real world
  - User control and freedom
  - Consistency and standards
  - Error prevention
  - Recognition rather than recall
  - Flexibility and efficiency of use
  - Aesthetic and minimalist design
  - Help users recognize, diagnose, and recover from errors
  - Help and documentation
  
- Depending of the product and goals a different set may be appropriate

# Heuristic Evaluation - Steps

- Preparation
  - Assessing appropriate ways to use heuristic evaluation
  - Define Heuristics
  - Having outside evaluation expert learn about the domain and scenario
  - Finding and scheduling evaluators
  - Preparing the briefing
  - Preparing scenario for the evaluators
  - Briefing (system expert, evaluation expert, evaluators)
  - Preparing the prototype (software/hardware platform) for the evaluation
- Evaluation
  - Evaluation of the system by all evaluators
  - Observing the evaluation sessions
- Analysis
  - Debriefing (evaluators, developers, evaluation expert)
  - compiling list of usability problems (using notes from evaluation sessions)
  - Writing problem descriptions for use in severity-rating questionnaire
  - Severity rating

# Heuristic Evaluation – Severity Rating

- Severity ratings are used to prioritize problems
- Decision whether to release a system or to do further iterations
- The severity of a usability problem is a combination of three factors:
  - The frequency with which the problem occurs: Is it common or rare?
  - The impact of the problem if it occurs: Will it be easy or difficult for the users to overcome?
  - The persistence of the problem: Is it a one-time problem that users can overcome once they know about it or will users repeatedly be bothered by the problem
- 0 to 4 rating scale to rate the severity of usability problems:
  - 0 = I don't agree that this is a usability problem at all
  - 1 = Cosmetic problem only: need not be fixed unless extra time is available on project
  - 2 = Minor usability problem: fixing this should be given low priority
  - 3 = Major usability problem: important to fix, so should be given high priority
  - 4 = Usability catastrophe: imperative to fix this before product can be released

# References Chapter 6

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