Heuristic Evaluation

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CSE 440

February 19, 2013

Hall of Fame or Shame?

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Minimalist reading mode.

Truth, Lies, and 'Doxxing': The Real Moral of the Gawker/Reddit Story

wired.com | Danah Boyd | March 21st, 2012 | view original

Sitting U.S. President Ford was visiting San Francisco in 1975 when a woman attempted to shoot him. A former marine named Oliver Sipple grabbed the gun, preventing the assassination attempt. When the press began contacting him, he asked that his sexuality not be discussed. While Sipple was very active in the gay men's scene in the Castro, he was not out to family or work. But Harvey Milk, a famous gay rights activist, chose to out him so the public could see that gay men could be heroes, too.

The cost to Sipple was devastating. The White House distanced itself from him, his family rejected him, and he sunk into a dark depression. He gained massive amounts of weight, began ... young age of 47. Many around Sipple reported that he regretted his act of heroism and the attention resulting from it. But for Harvey Milk, the potential social good from using Sipple's story far outweighed what he perceived as the costs of outing him.

Hall of Fame or Shame?

Get Help For Your Device or App

iPhone   iPad   Android   Browser Extensions   Web App

Items can be saved from iPhone, iPad, Android devices, web app, Chrome/Firefox extension, or email.

Hall of Fame!

Good

– beautiful visual design

– support across a large number of devices means you can always use it

– optimized for quickly and easily saving and reading articles

Bad

– significantly reformats content

– saves link from tweets, but not the message

Heuristic Evaluation

Prof. James A. Landay
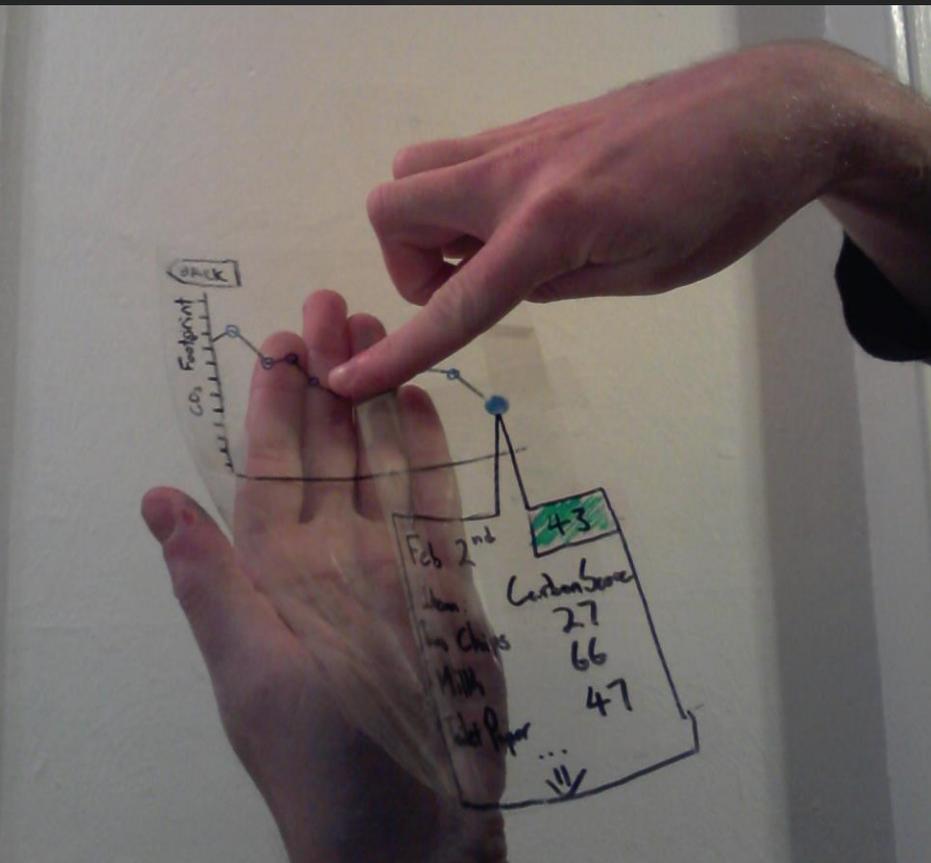University of Washington

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Outline

- HE Process Overview
- The Heuristics
- How to Perform Heuristic Evaluation
- Heuristic Evaluation vs. Usability Testing

Evaluation

- About figuring out how to improve design
- Issues with lo-fi tests?

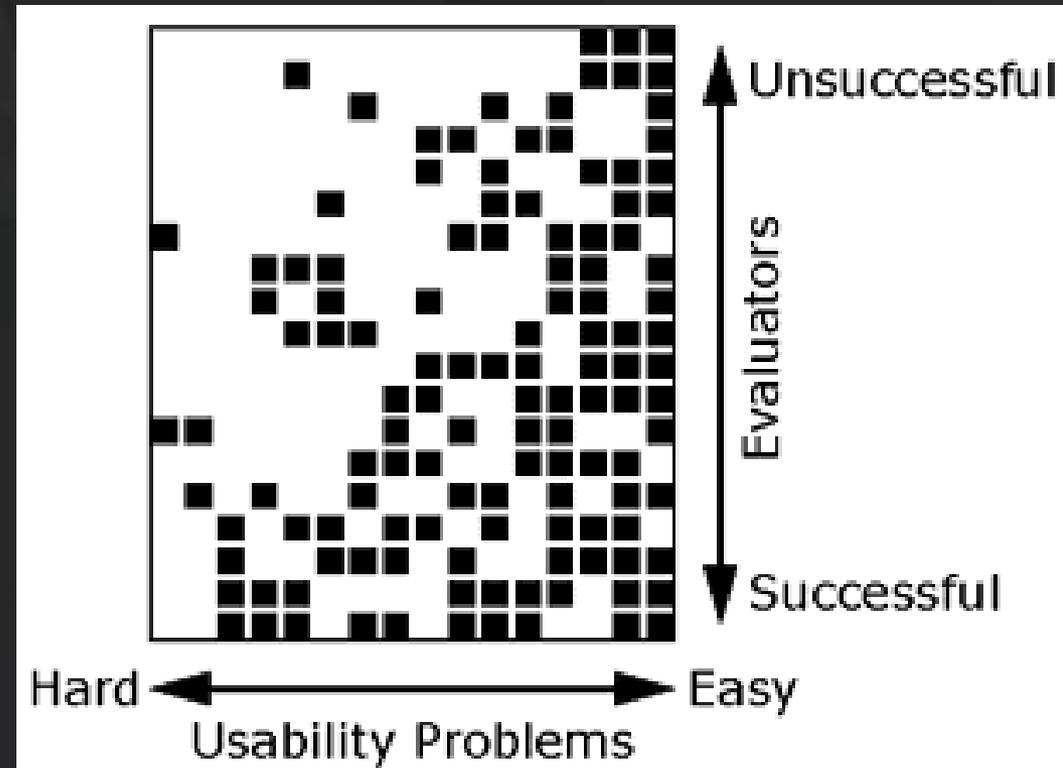# Heuristic Evaluation

- Developed by Jakob Nielsen
- Helps find usability problems in a UI design
- Small set (3-5) of evaluators examine UI
  - independently check for compliance with usability principles ("heuristics")
  - different evaluators will find different problems
  - evaluators only communicate afterwards
    - findings are then aggregated
- Can perform on working UI or on sketches

Why Multiple Evaluators?

- Every evaluator doesn't find every problem

- Good evaluators find both easy & hard ones

Heuristic Evaluation Process

- Evaluators go through UI several times
  - inspect various dialogue elements
  - compare with list of usability principles
  - consider other principles/results that come to mind

- Usability principles
  - Nielsen's "heuristics"
  - supplementary list of category-specific heuristics
    - competitive analysis & user testing of existing products

- Use violations to redesign/fix problems

Heuristics (original)

- H1-1: Simple & natural dialog
- H1-2: Speak the users' language
- H1-3: Minimize users' memory load
- H1-4: Consistency
- H1-5: Feedback

- H1-6: Clearly marked exits
- H1-7: Shortcuts
- H1-8: Precise & constructive error messages
- H1-9: Prevent errors
- H1-10: Help and documentation

Heuristics (revised set)
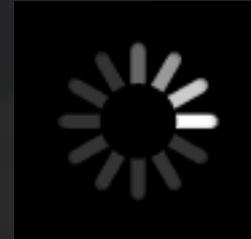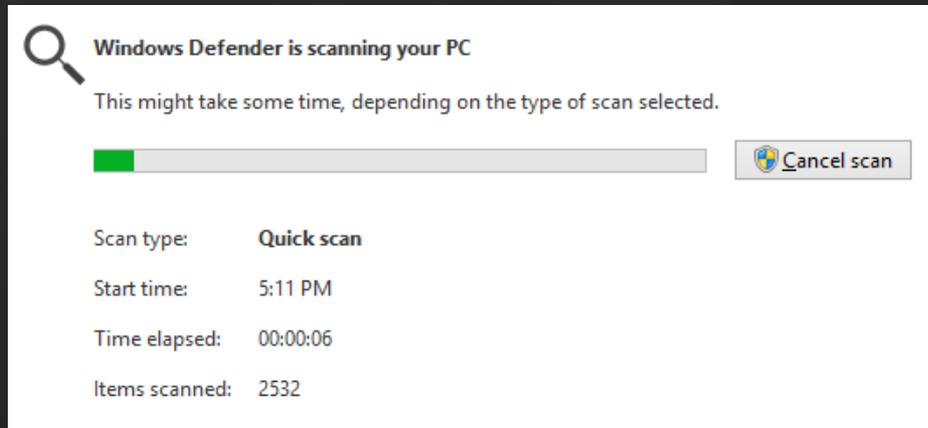
- ## H2-1: Visibility of system status
  - keep users informed about what is going on
  - example: pay attention to response time
    - 0.1 sec: no special indicators needed, why?
    - 1.0 sec: user tends to lose track of data
    - 10 sec: max. duration if user to stay focused on action
    - for longer delays, use percent-done progress bars
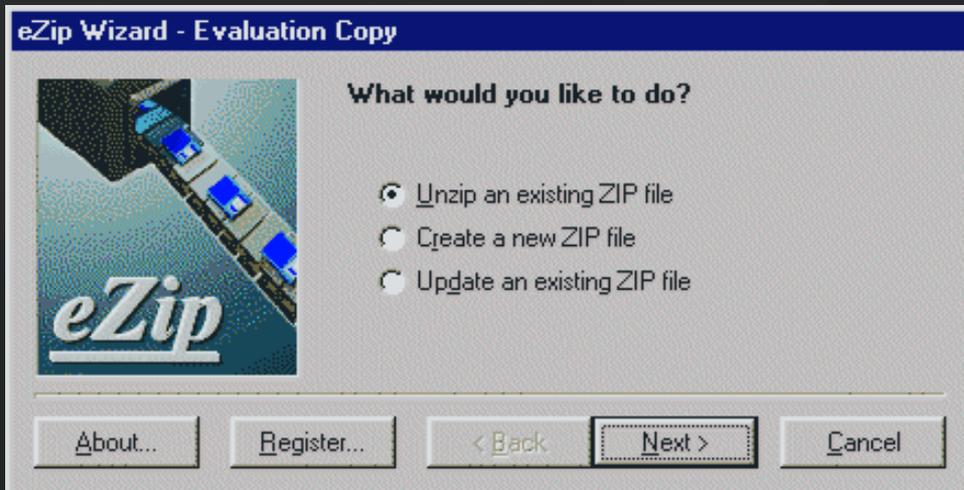
Heuristics (cont.)
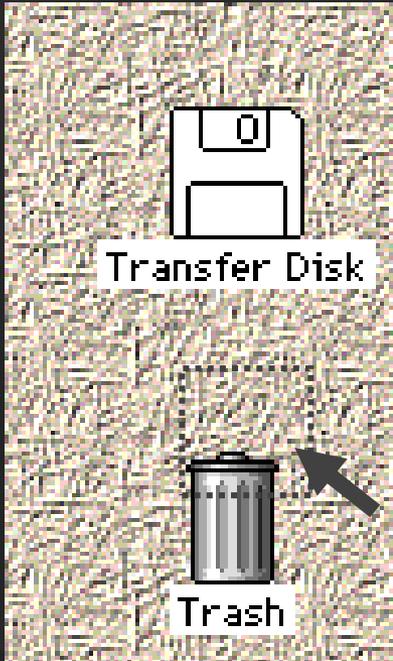
- Bad example: Mac desktop
  - Dragging disk to trash
    - should delete it, *not* eject it
- H2-2: Match between system & real world
  - speak the users' language
  - follow real world conventions

Heuristics (cont.)

- Wizards
  - must respond to Q before going to next
  - for infrequent tasks
    - (e.g., modem config.)
  - not for common tasks
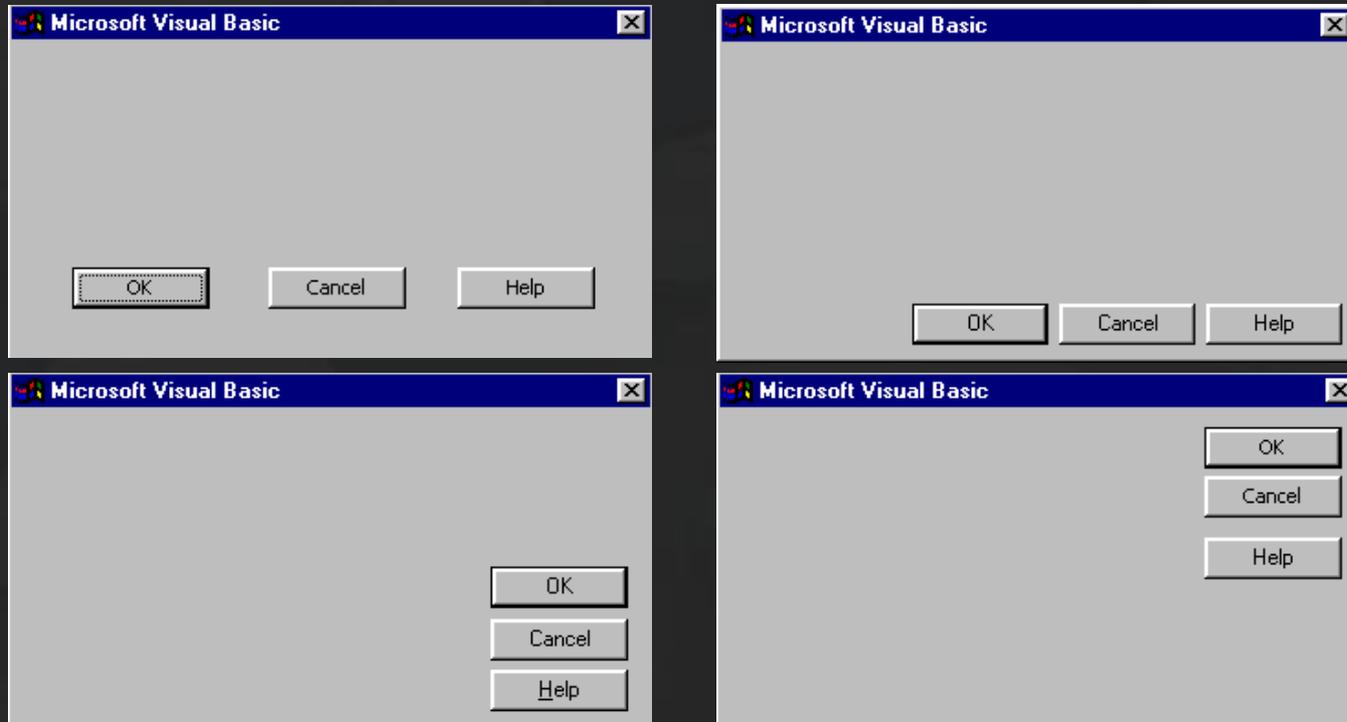 - good for beginners
    - have 2 versions (WinZip)

- H2-3: User control & freedom
  - "exits" for mistaken choices, undo, redo
  - don't force down fixed paths
    - like that BART machine…

Heuristics (cont.)

HCI: User Interface Design, Prototyping, & Evaluation

Heuristics (cont.)

- H2-4: Consistency & standards
  - use the same language, placement, etc. everywhere
  - follow platform conventions

Heuristics (cont.)

- H2-5: Error prevention
- H2-6: Recognition rather than recall
  – make objects, actions, options, & directions visible/easily retrievable

```
% rm -rf *
%
```
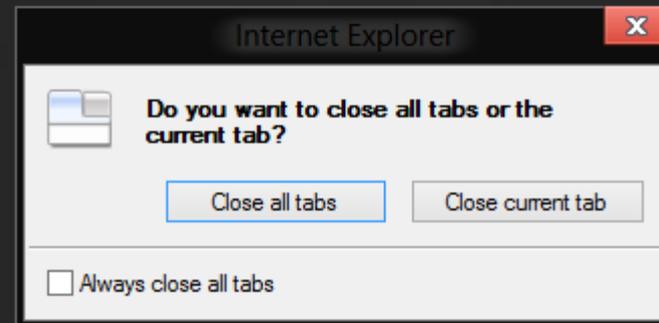
Heuristics (cont.)

- H2-7: Flexibility and efficiency of use
  - accelerators for experts (e.g., gestures, kb shortcuts)
  - allow users to tailor frequent actions (e.g., macros)

Heuristics (cont.)

- H2-8: Aesthetic & minimalist design
  - no irrelevant information in dialogues

Heuristics (cont.)
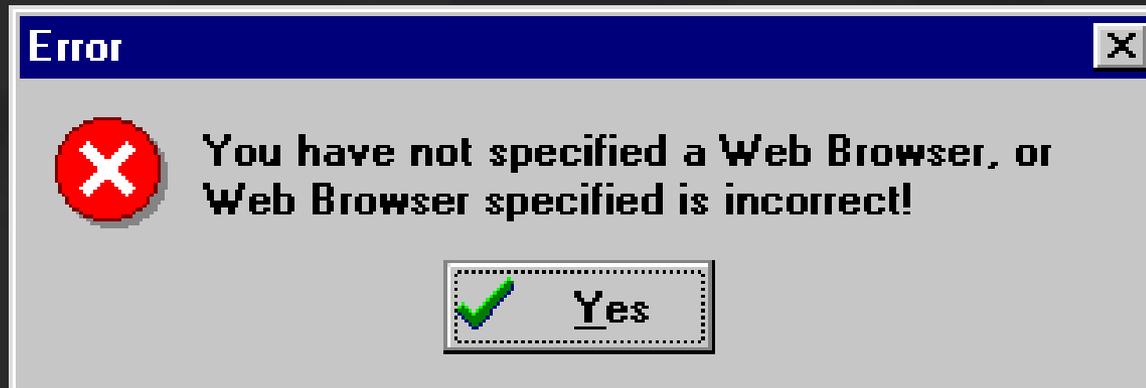
- H2-9: Help users recognize, diagnose, & recover from errors
  - error messages in plain language
  - precisely indicate the problem
  - constructively suggest a solution

Good Error Messages

- Clearly indicate something has gone wrong
- Be human readable
- Be polite
- Describe the problem
- Explain how to fix it
- Be highly noticeable

Heuristics (cont.)

- H2-10: Help and documentation
  - easy to search
  - focused on the user's task
  - list concrete steps to carry out
  - not too large

:(

Your PC ran into a problem and needs to restart. We're just collecting some error info, and then we'll restart for you. (0% complete)

If you'd like to know more, you can search online later for this error: HAL_INITIALIZATION_FAILED

Mobile Heuristics

Mobile Heuristic	Description
Heuristic 1	Visibility of system status and losability/findability of the mobile device
Heuristic 2	Match between system and the real world
Heuristic 3	Consistency and mapping
Heuristic 4	Good ergonomics and minimalist design
Heuristic 5	Ease of input, screen readability and glancability
Heuristic 6	Flexibility, efficiency of use and personalization
Heuristic 7	Aesthetic, privacy and social conventions
Heuristic 8	Realistic error management

Enrico Bertini, Silvia Gabrielli, and Stephen Kimani. 2006. Appropriating and assessing heuristics for mobile computing. In Proceedings of the working conference on Advanced visual interfaces (AVI '06). ACM, New York, NY, USA, 119-126. DOI=10.1145/1133265.1133291 http://doi.acm.org/10.1145/1133265.1133291

Phases of Heuristic Evaluation

1) Pre-evaluation training
  – give evaluators needed domain knowledge & information on the scenario

2) Evaluation
  – individuals evaluates UI & makes list of problems

3) Severity rating
  – determine how severe each problem is

4) Aggregation
  – group meets & aggregates problems (w/ ratings)

5) Debriefing
  – discuss the outcome with design team

How to Perform Evaluation

- At least two passes for each evaluator
  - first to get feel for flow and scope of system
  - second to focus on specific elements
- If system is walk-up-and-use or evaluators are domain experts, no assistance needed
  - otherwise might supply evaluators with scenarios
- Each evaluator produces list of problems
  - explain why with reference to heuristic or other information
  - be specific & list each problem separately

Examples

- Can't copy info from one window to another
  - violates "Minimize the users' memory load" (H1-3)
  - fix: allow copying
- Typography uses different fonts in 3 dialog boxes
  - violates "Consistency and standards" (H2-4)
  - slows users down
  - probably wouldn't be found by user testing
  - fix: pick a single format for entire interface

How to Perform Heuristic Evaluation

- Why separate listings for each violation?
  - risk of repeating problematic aspect
  - may not be possible to fix all problems
- Where problems may be found
  - single location in UI
  - two or more locations that need to be compared
  - problem with overall structure of UI
  - something that is missing
    - common problem with paper prototypes
    - note: sometimes features are implied by design docs and just haven't been "implemented" – relax on those

Severity Rating

- Used to allocate resources to fix problems
- Estimates of need for more usability efforts
- Combination of
  - frequency
  - impact
  - persistence (one time or repeating)
- Should be calculated after all evals. are in
- Should be done independently by all judges

Severity Ratings (cont.)

0 – don't agree that this is a usability problem

1 - cosmetic problem

2 - minor usability problem

3 - major usability problem; important to fix

4 - usability catastrophe; imperative to fix

Debriefing

- Conduct with evaluators, observers, and development team members

- Discuss general characteristics of UI

- Suggest potential improvements to address major usability problems

- Dev. team rates how hard things are to fix

- Make it a brainstorming session
  - little criticism until end of session

Severity Ratings Example

1. [H1-4 Consistency] [Severity 3][Fix 0]

The interface used the string "Save" on the first screen for saving the user's file, but used the string "Write file" on the second screen. Users may be confused by this different terminology for the same function.

HE vs. User Testing

- HE is much faster
  - 1-2 hours each evaluator vs. days-weeks
- HE doesn't require interpreting user's actions
- User testing is far more accurate (by def.)
  - takes into account actual users and tasks
  - HE may miss problems & find "false positives"
- Good to alternate between HE & user testing
  - find different problems
 - don't waste participants

Results of Using HE

- Discount: benefit-cost ratio of 48 [Nielsen94]
  - cost was $10,500 for benefit of $500,000
  - value of each problem ~15K (Nielsen & Landauer)
  - how might we calculate this value?
    - in-house $\rightarrow$ productivity; open market $\rightarrow$ sales
- Correlation between severity & finding w/ HE
- Single evaluator achieves poor results
  - only finds 35% of usability problems
  - 5 evaluators find ~ 75% of usability problems
  - why not more evaluators???? 10? 20?
    - adding evaluators costs more & won't find more probs

Decreasing Returns

problems found
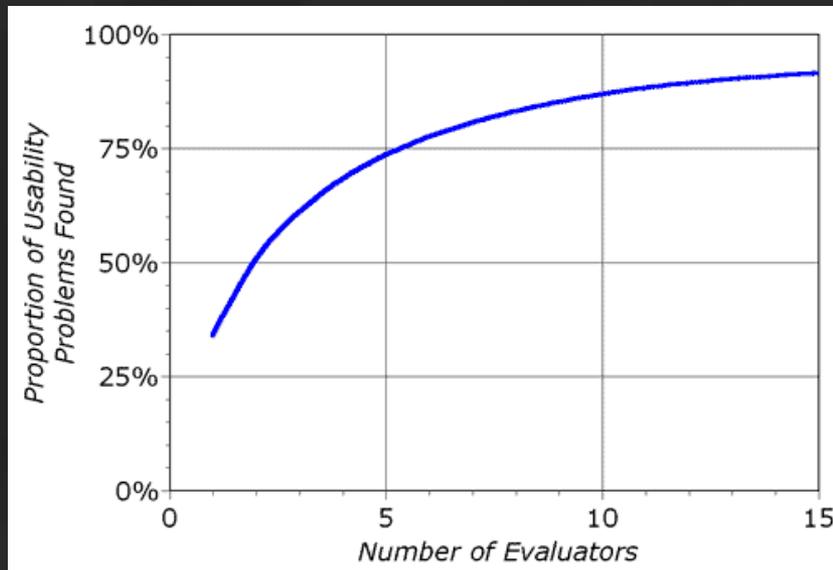
benefits / cost
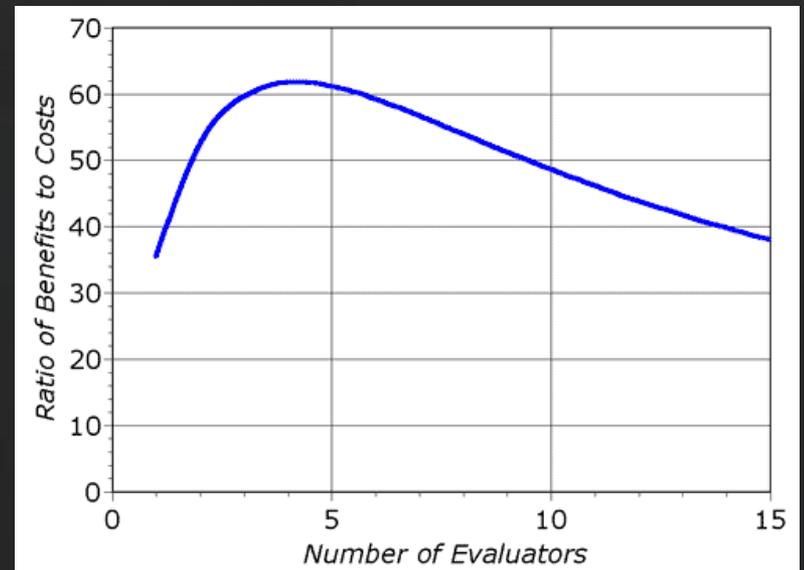
* Caveat: graphs for a specific example

Summary

- Have evaluators go through the UI twice
- Ask them to see if it complies with heuristics
  - note where it doesn't & say why
- Combine the findings from 3 to 5 evaluators
- Have evaluators independently rate severity
- Alternate with user testing

- Books
  - *Usability Engineering*, by Nielsen, 1994
- Web Sites & mailing lists
  - http://www.nngroup.com/articles/
  - UTEST mail list