Design Reviews

Scott Klemmer

TAs: Marcello Bastea-Forte, Joel Brandt, Neil Patel, Leslie Wu, Mike Cammarano

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Design

Applied Psychology

Computer Science

Design

Applied Psychology

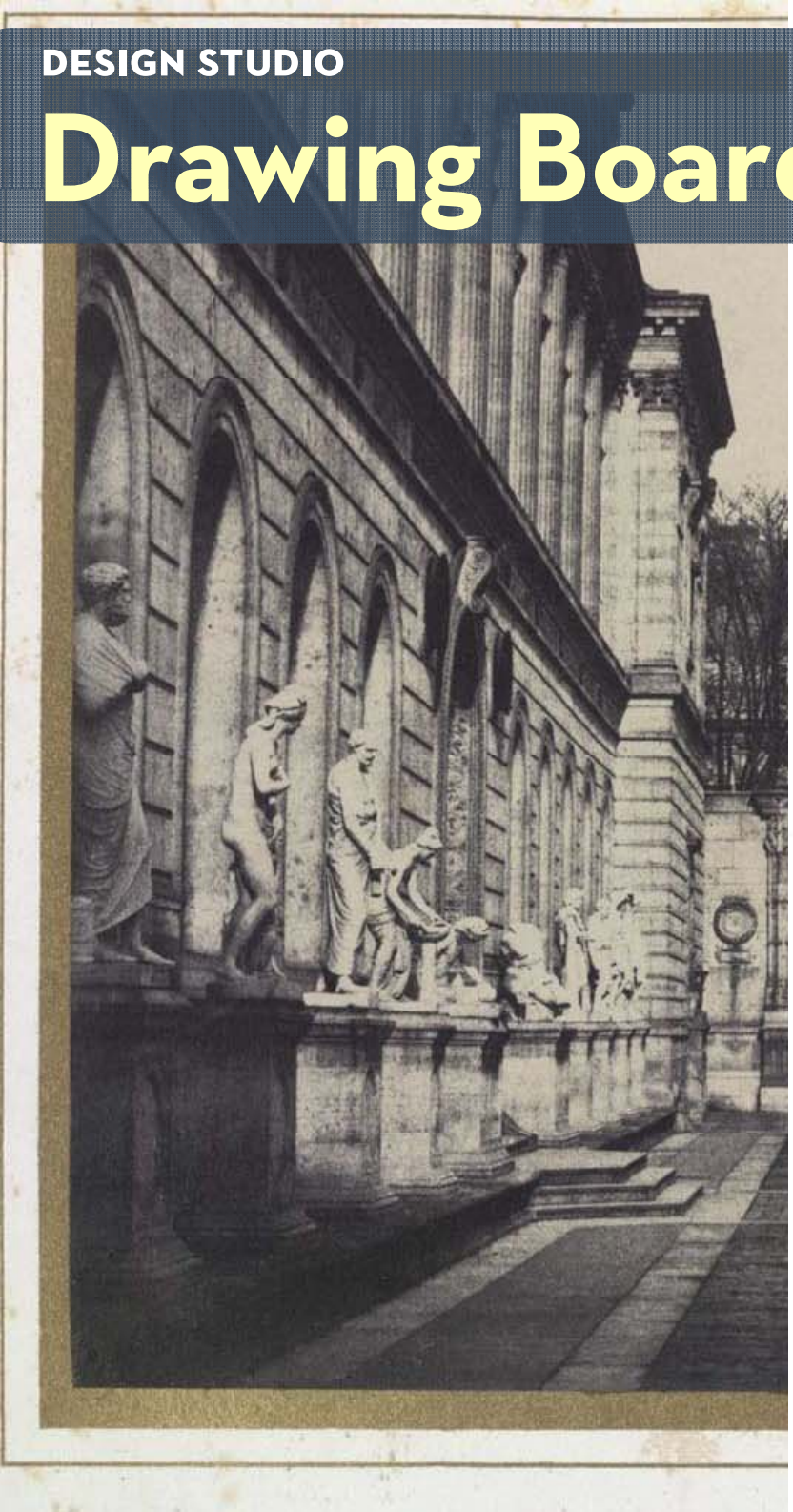
Computer Science

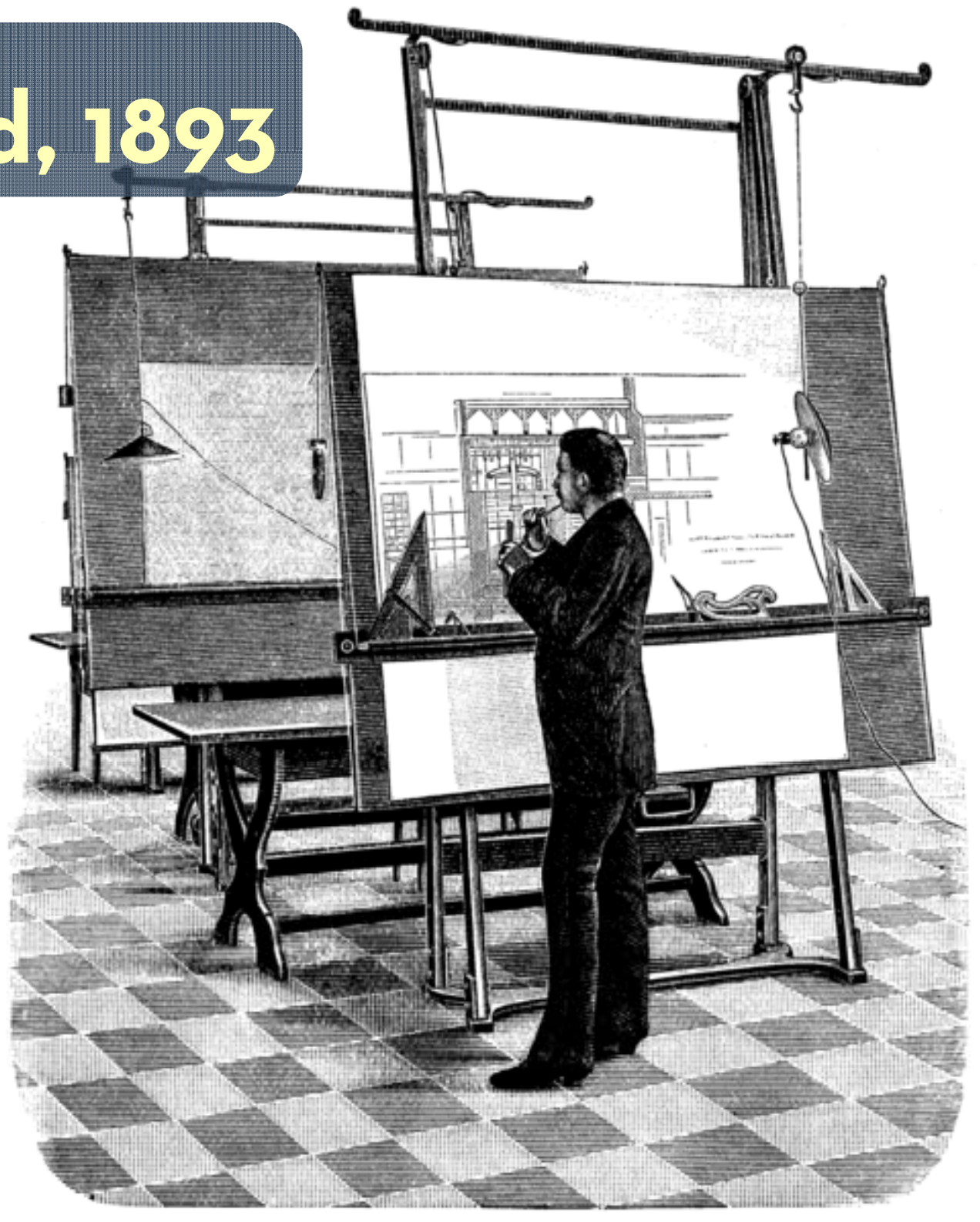
DESIGN STUDIO

École Des Beaux-Arts, Paris

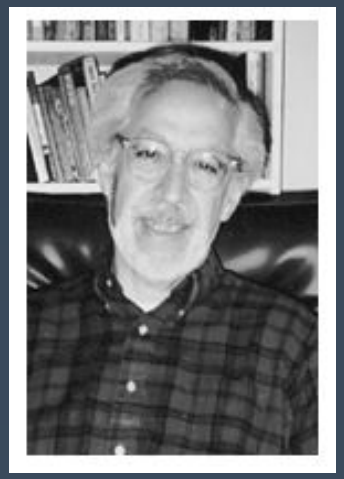
DESIGN STUDIO

Drawing Board, 1893





Donald Schön



"The schools of other professions have a great deal to learn from the unique institution of architectural education, the studio. In the context of the modern research university, the architectural studio is deviant. It is a throwback to an earlier mode of education and an earlier epistemology of practice."

Design

Applied Psychology

Computer Science

Four genres of evaluation

Automated	Usability measures computed by software
Empirical	Usability assesses by testing with real users
Formal	Models and formulas to calculate measures
Inspection	Based on heuristics, skills, and experience of evaluators

HCI inspection methods

- Studio critiques
- Heuristic evaluation
- **Heuristic evaluation**
- Cognitive Walkthroughs
- Formal Usability Inspections
- Pluralistic Walkthroughs
- Feature Inspection
- Consistency Inspection
- Standards Inspection
- Guideline checklists

...

Source: http://www.usability.net/tools/methods.html, http://jthom.best.vwh.net/usability/toc.htm

Getting the Design *Right*

vs.

Getting the *Right* Design

Richard Sewell, printmaker

“I can’t critique just one thing.”

Commitment & Emotional Investment

Critique & Self-Efficacy

Begin Review with a Clear Goal

When to do a design review?

- **Before user testing.** Don't waste users on the small stuff. An expert usability inspection will identify minor issues that can be resolved before testing, allowing users to focus on the big issues.

- **Before redesigning.** Don't throw out the baby with the bathwater. An expert usability inspection will expose the elements of your existing design that work and should be retained (not just the bad stuff).

- **When you know there are problems, but you need evidence.** Perhaps you've received complaints from customers or found yourself stumbling around your own site. An expert usability inspection can help you articulate problems and provide you with the ammunition to build a business case for redesign.

- **Before release.** [Smooth] off the rough edges before go-live.

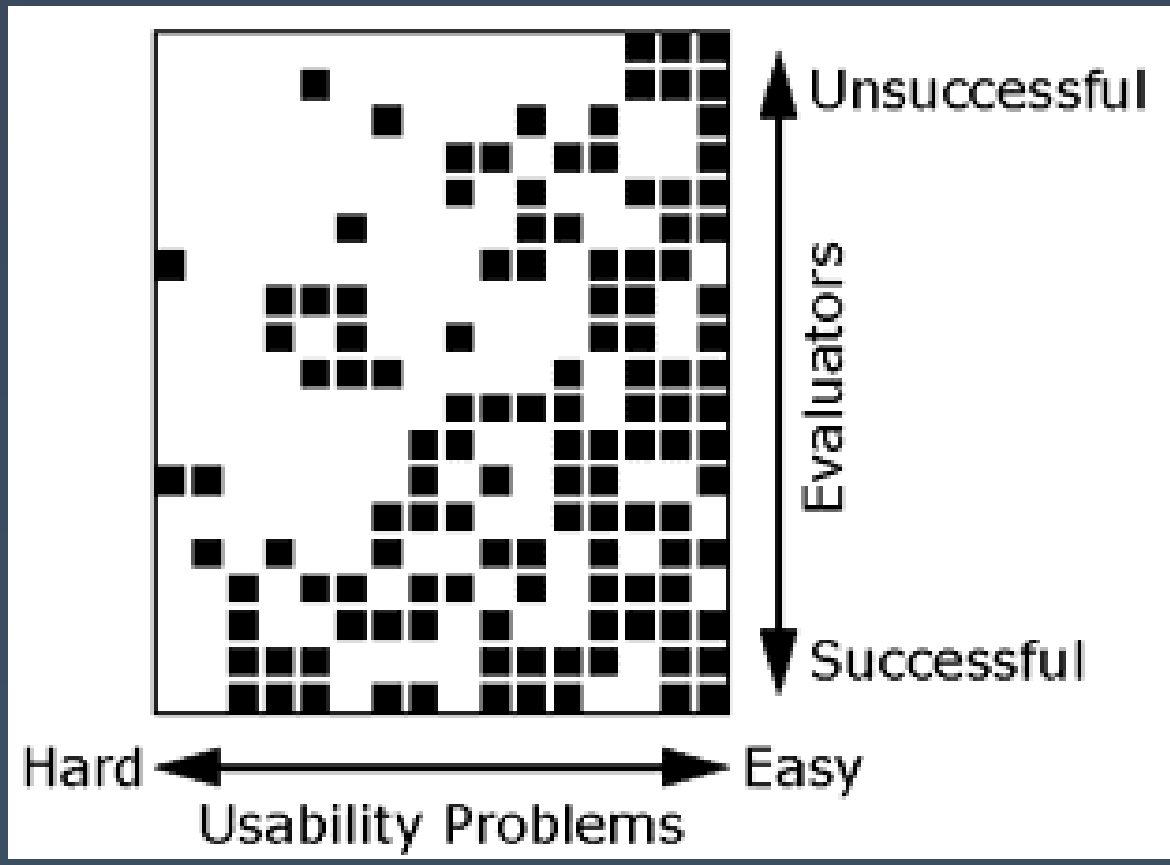
Source: http://www.etre.com/usability/inspection

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?

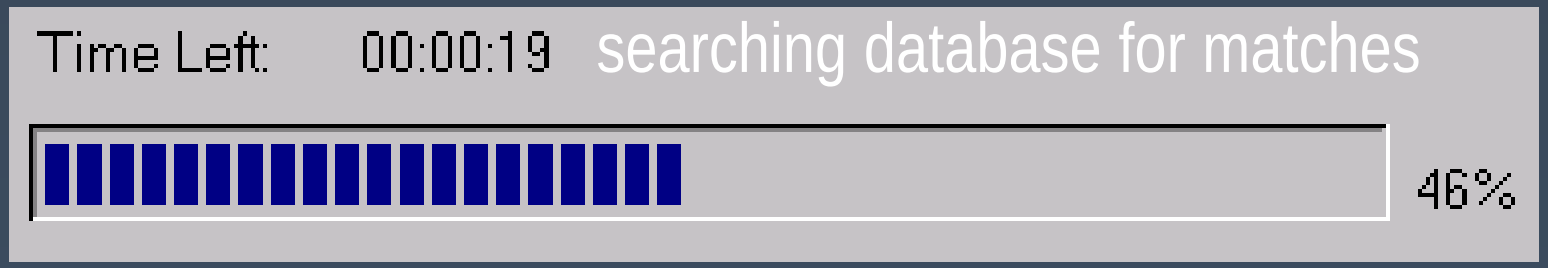
- Every evaluator doesn't find every problem
- Good evaluators find both easy & hard ones



Heuristic Evaluation Process

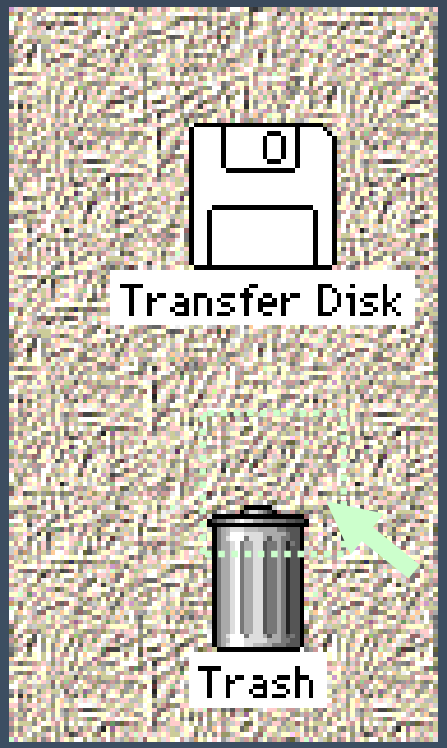
- Evaluators go through UI several times
  - inspect various dialogue elements
  - compare with list of usability principles
  - consider other principles/results that come to mind
- Usability principles
  - Nielsen's "heuristics"
  - supplementary list of category-specific heuristics
    - competitive analysis & user testing of existing products
- Use violations to redesign/fix problems

Heuristic 1



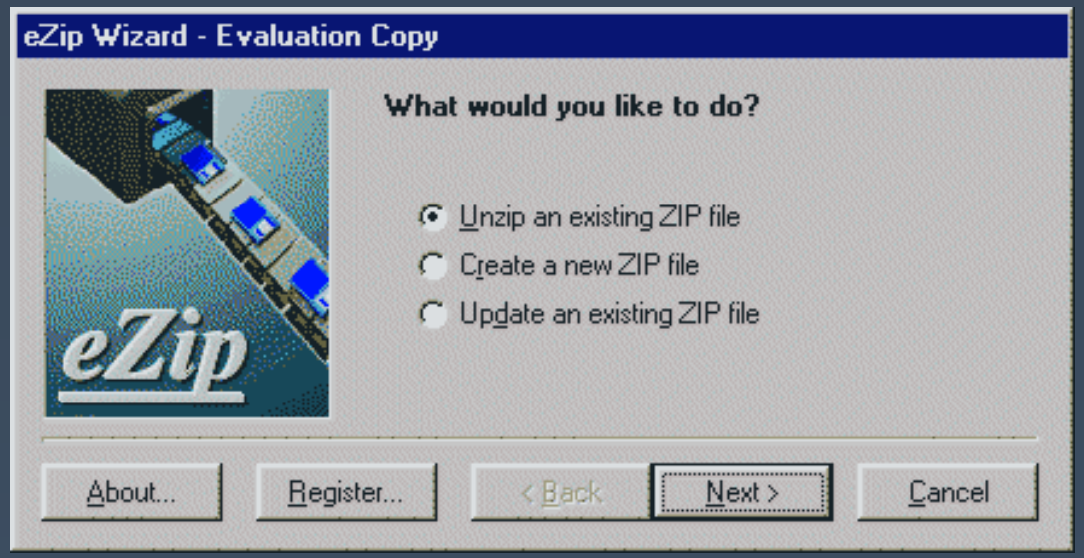
- Visibility of system status
  - keep users informed about what is going on
  - example: pay attention to response time
    - 0.1 sec: no special indicators needed, why?
    - 1.0 sec: user tends to lose track of data
    - 10 sec: max. duration if user to stay focused on action
    - for longer delays, use percent-done progress bars

Heuristic 2



- Bad example: Mac desktop
  - Dragging disk to trash
- Match between system & real world
  - speak the users' language
  - follow real world conventions

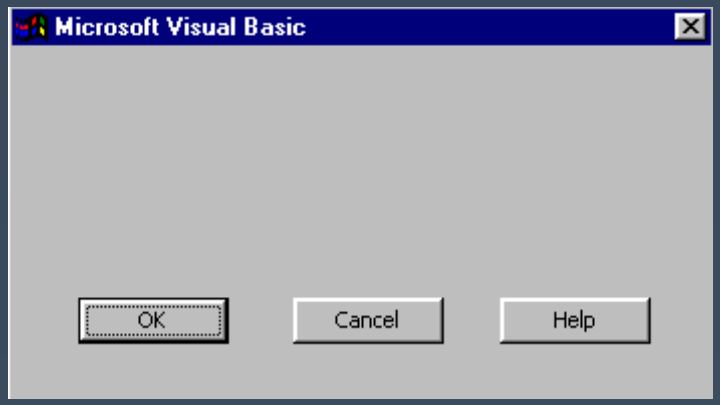
Heuristic 3



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

- 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)

Heuristic 4


Microsoft Visual Basic
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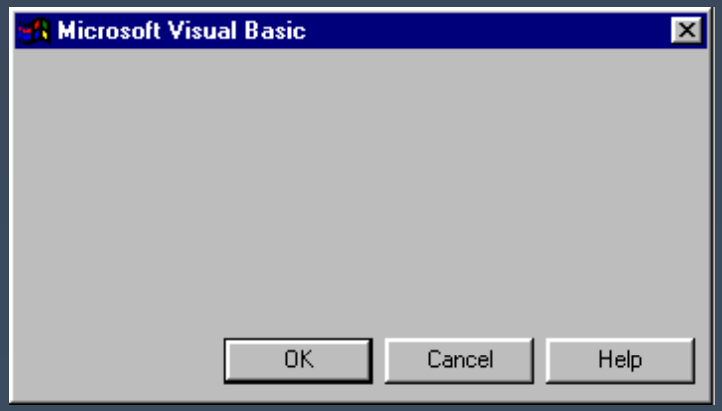
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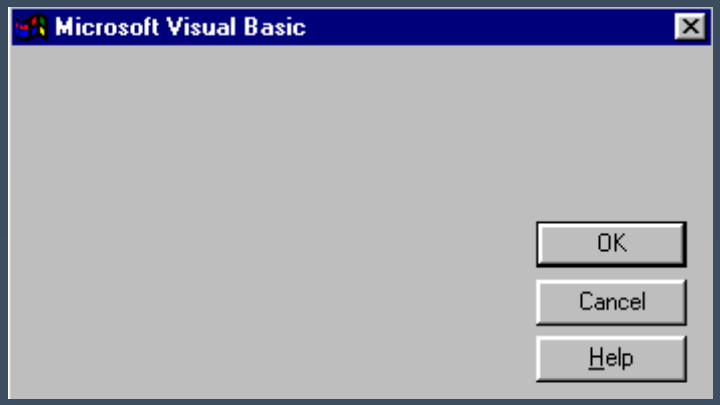
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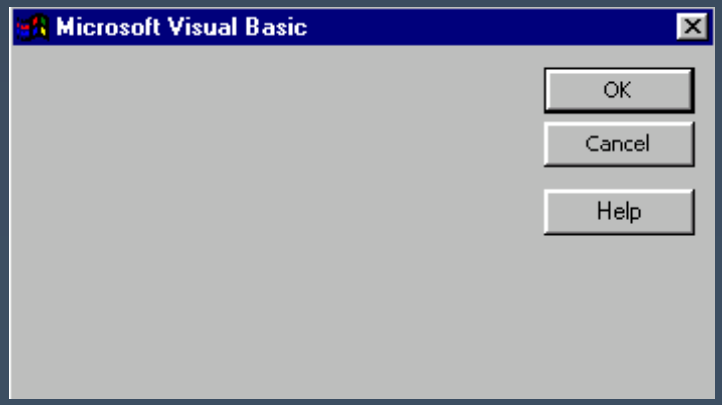
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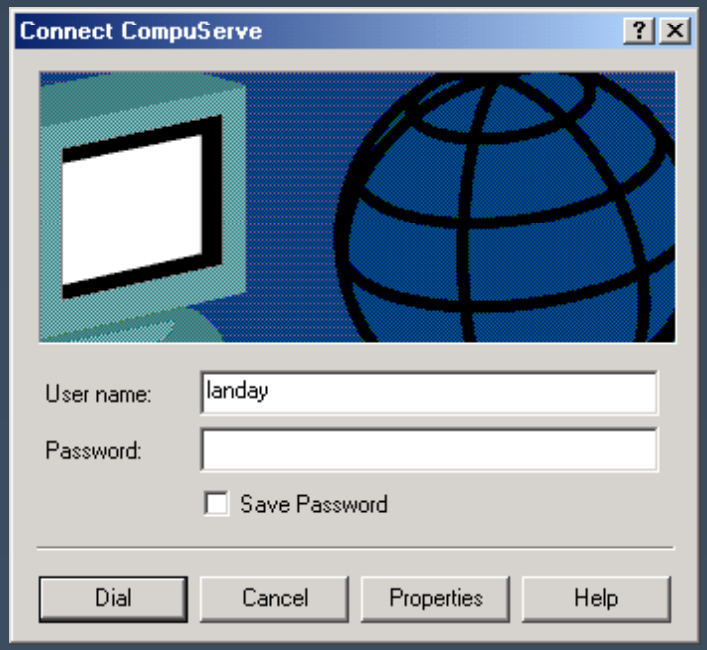
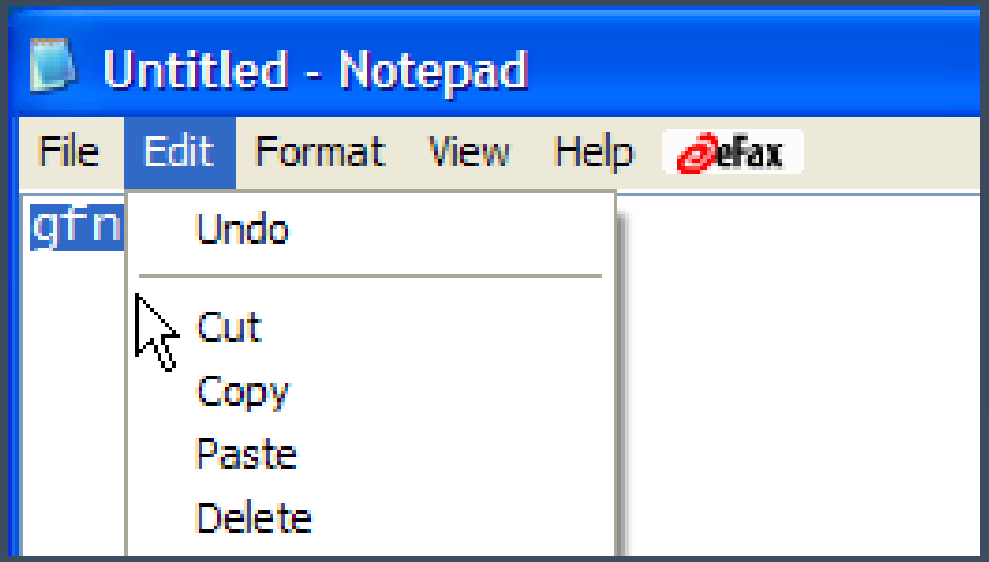
Heuristics (cont.)



- MS Web Pub. Wiz.
- Before dialing
  - asks for id & password
- When connecting
  - asks again for id & pw

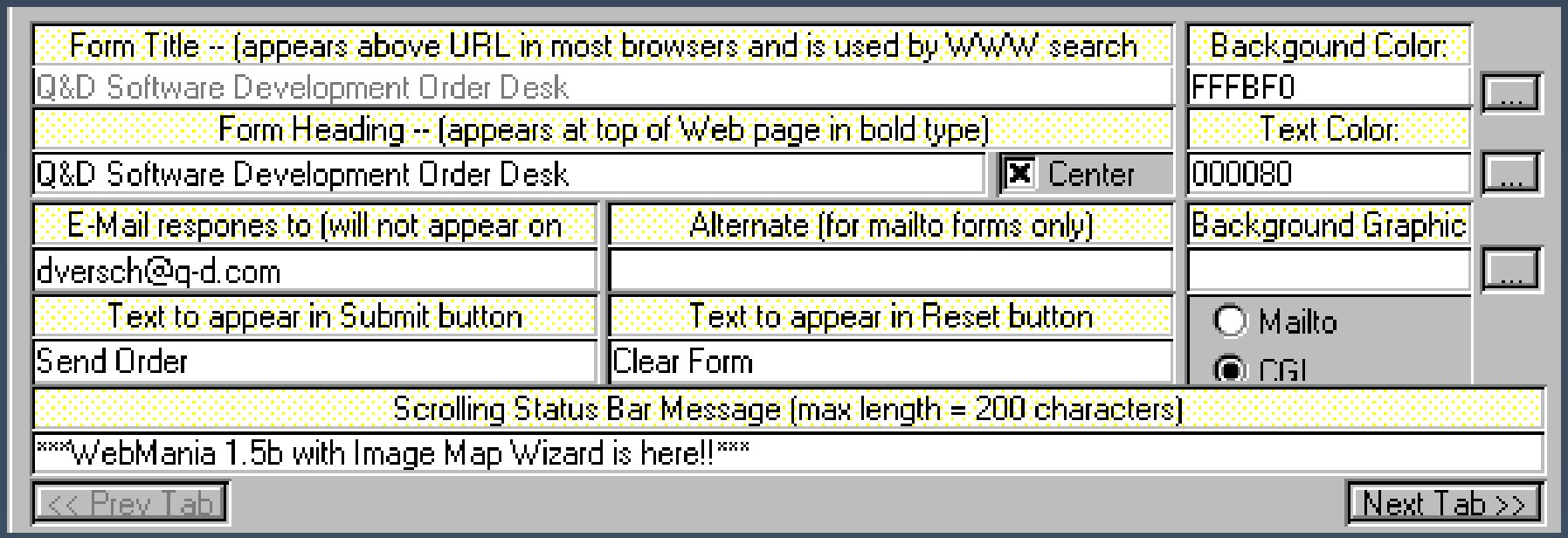
- H2-5: Error prevention
- H2-6: Recognition rather than recall
  - make objects, actions, options, & directions visible or easily retrievable

Heuristics (cont.)



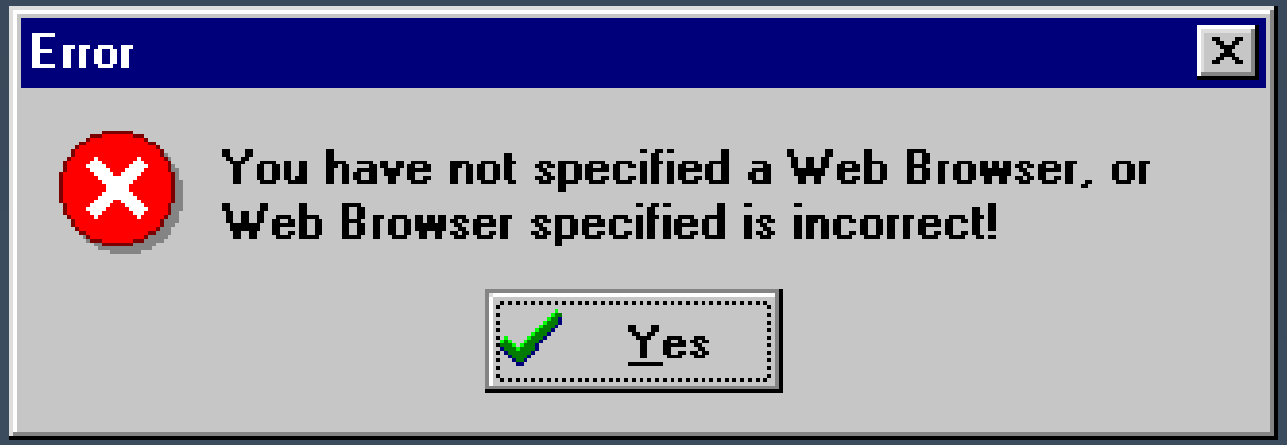
- H2-7: Flexibility and efficiency of use

Heuristics (cont.)



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

Heuristics (cont.)



- H2-9: Help users recognize, diagnose, and recover from errors
  - error messages in plain language
  - precisely indicate the problem
  - constructively suggest a solution

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

Phases of Heuristic Evaluation

1) Pre-evaluation training
   - give evaluators needed domain knowledge and information on the scenario
2) Evaluation
   - individuals evaluate and then aggregate results
3) Severity rating
   - determine how severe each problem is (priority)
     - can do this first individually and then as a group
4) 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 and 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 mix of upper/lower case formats and fonts
  - 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 H. 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
    - hard w/ paper prototypes so work extra hard on those
    - 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

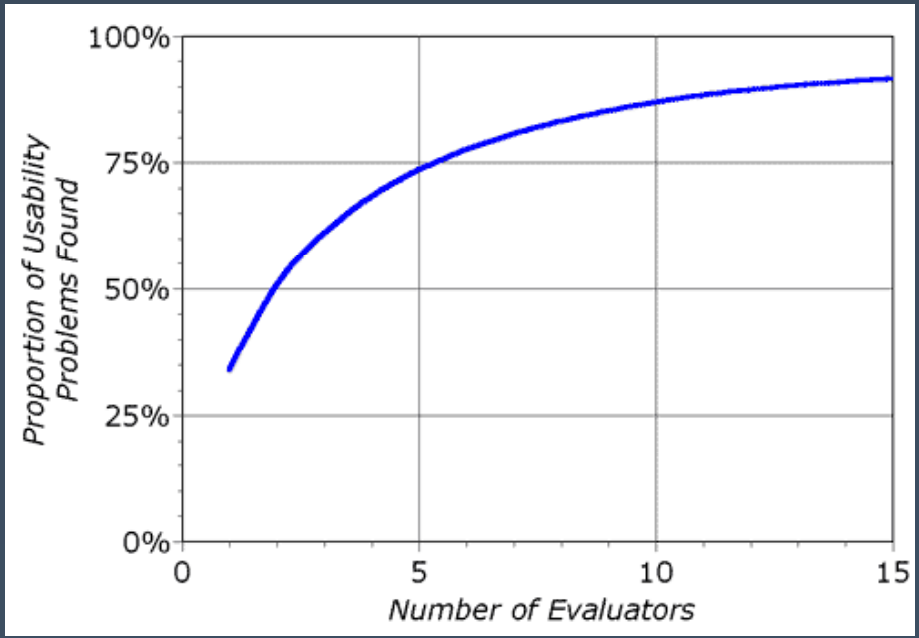
- HE is much faster
  - 1-2 hours each evaluator vs. days-weeks
- HE doesn't require interpreting user's actions
- User testing is far more accurate (by def.)
  - takes into account actual users and tasks
  - HE may miss problems & find "false positives"
- Good to alternate between HE & user testing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

Results of Using HE

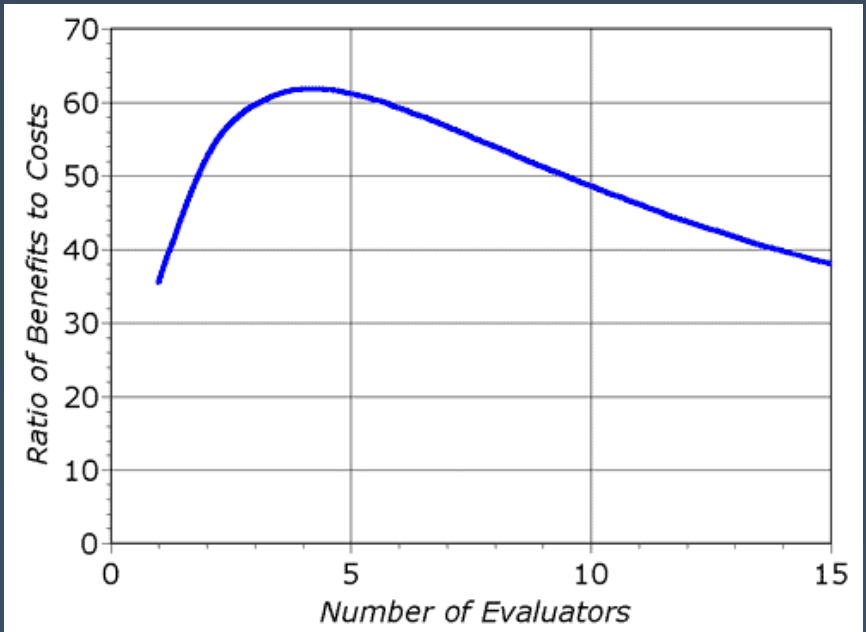
- Discount: benefit-cost ratio of 48 [Nielsen94]
  - cost was $10,500 for benefit of $500,000
  - value of each problem ~15K (Nielsen & Landauer)
  - how might we calculate this value?
    - in-house -> productivity; open market -> sales
- Correlation between severity & finding w/ HE
- Single evaluator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

Decreasing Returns

problems found

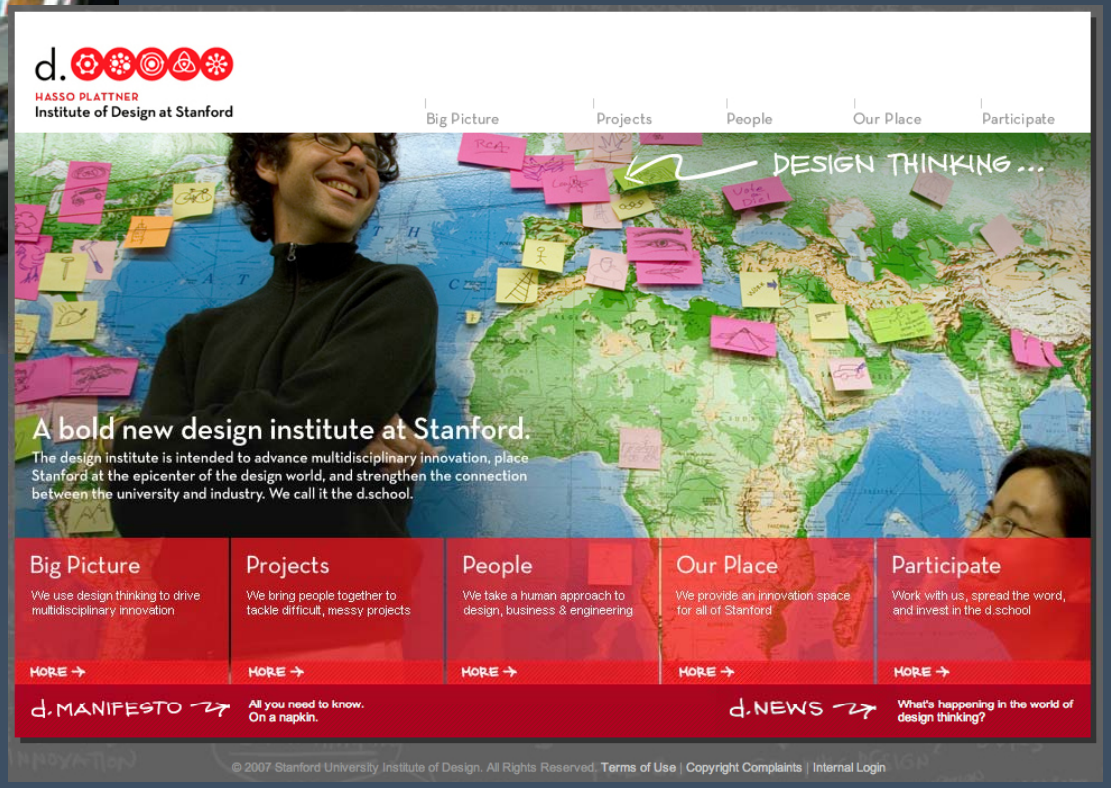


benefits / cost



- Caveat: graphs for a specific example

Eye to the future: Virtual (& Physical) Design Studios



Source: Alfredo Andia. Seventh International Conference on Virtual Systems and Multimedia (VSMM'01) p. 687. Internet Studios: Design Studios Online Among Seven Schools Architecture in the United States and Latin America; http://sennewald.be/adrian/blog/wp-content/2007/03/osu_studio_360_2_big.jpg; ; Stanford d.school

Announcements

- **Flash Tutorial Location Change** - Gates 104
  Someone will be at front door of Gates (facing Serra) to let you in from 5:45 - 6:15.
- **Python Tutorial Scheduled**
  Mon Oct 29 - 6pm - 8pm in 420-041
- cs547 tomorrow: Paul Tang, Designing a Health-Care Interface

Further Reading

- Donald Schön, The Design Studio
- Bill Buxton, Sketching User Experience
- Jakob Nielsen, Usability Inspection Methods