



Human-Computer Interaction IS4300

1



Nielsen Ch 1 – Case Studies

- Rotary dial telephone – 1 hour usability test sped up dialing by 0.15s/digit = \$1M/yr savings
- \$100K usability test of an insurance form = \$563,023 savings in labor for staff to manually fix errors
 - Previously customers made 7.8 errors/form
- Reduction of Boeing 757 flight crew from 3 to 2
- Reduction in operating instructions for pager from 3,000 words to 150 words



Need for Usability

- Study: 63% of software budgets overran. Most-stated reasons:
 - Frequent change requests by users
 - Overlooked tasks
 - User's lack of understanding of own requirements
 - Insufficient user-analyst communication
 - All are usability issues!



Business Case for Usability is Often Difficult

- Marginal improvements in efficiency are hard to quantify, so ROI is often difficult to justify
- Average usability budget for software development projects = 1.5 person-years (ideal = 2.3)
- Published study: average cost is \$128,330 (\$253,347 in today's dollars)

Your software will be tested for usability

- Even if you don't do it...
- By your users!
- Change requests 100x more expensive than problems corrected during development



Nielsen's Slogans

- Your best guess is not good enough
- The user is always right
- The user is not always right
- Users are not designers
- Designers are not users
- Vice presidents are not users
- Less is more
- Details matter
- Help doesn't



Discount Usability Engineering

- Usability doesn't need to cost so much!
- User & Task observation
- Scenarios
 - Narrative
 - Paper prototype
 - Software prototype
- Thinking aloud (formative usability test)
- Heuristic evaluation



Management plan for Usability

1. Recognize need for usability
2. Give visible management support
3. Devote resources
4. Integrate usability into development lifecycle
5. Ensure all UIs are subjected to user testing



Handbook of HCI

Cost Justification – Bias, et al

- Impacts of more usable systems
 - Lower development cost (problems found early)
 - Less documentation required
 - Less training required
 - Less time required by User



Test Budget

- Personnel
- Tester compensation
- Computers
- Lab
- Special equipment (e.g., gaze tracker)
- Video/audio tapes

- WAG: \$3k + \$1k/user for typical industry test
 - 1993 \$, ~+150% now)

Example cost justification

TABLE 62.1. Usability Cost-Justification Software

Manufacturer	Year			Total
	1	2	3	
Cost				
Usability lab	(\$33,000)			
Usability lab projects	(\$179,974)			
Total cost	(\$212,974)	\$0	\$0	(\$212,974)
Cost savings				
Customer support	\$168,000	\$168,000	\$168,000	
Software development	\$15,050			
Additional sales				
Total cost savings	\$183,050	\$168,000	\$168,000	\$519,050
Net	(\$29,926)	\$168,000	\$168,000	\$306,074

Olympic Message System

- 1987 – usability still in infancy
- Case study of design methodology
- Voice messaging system
 - 35 computers, 8 month development





OMS Methodologies that we have used



OMS Design Principles

- Early focus on users and tasks
- Empirical
- Iterative design
- Integrated usability design



P8 – Finish Project & Do User Testing – due 12/2

- Complete enough of your implementation to support user testing
 - Should be fully functional unless you have a compelling rationale
- Complete user testing
 - Exactly as you did in Paper Prototyping, but with your software prototype
 - 3+ users, 3+ tasks
 - Briefing
 - Can demo system on additional task first
- Redesign
 - Sort severity problems by severity
 - Address as many as possible
- Document everything
- Post
 - Final software prototype
 - Report



P9 – Final Presentation 12/2

- Each project gets 5 minutes (hard limit)
 - Quick review of problem
 - Demo (use your computer – test A/V in advance)
 - Evaluation – focus on P8 user study



P9 – Final Report 12/9

- Reflective/Cumulative
 - At least 4 pages
 - Summarize all design and evaluation activities
 - Focus on design alternatives and rationale for selection
 - Reflection on methodology and experience



Final Exam

- Thu, 12/12, 8-9:30am, Hayden Hall 221
- Coffee & donuts if you all turn in TRACE reviews!

- Closed book
- Cumulative / Integrative



Final Exam

- 20% Concepts
- 15% UI Critique
- 25% Design problems
 - Design for web, mobile, desktop
- 40% Planning, Analyzing & Reporting Usability Test Results
 - Given a UI evaluation problem, write a test plan
 - Given a study plan and resulting data, analyze & sketch report
 - Quantitative and qualitative components



Topics

- Everything in Dix and lectures and concepts in readings is fair game
- Exceptions
 - Inferential statistics (details of hypothesis testing)
 - But, descriptive stats and experimental study design concepts (between vs. within subjects, sampling, randomization) may be covered

