

Computer/Human Interaction

Lecture 39

Overview:

- Usability Engineering in Practice
- Cost-Benefit Analysis
- Internationalization and Localization
- Ethical/Social Issues

Assignment: Homework 6 out, due Friday as part of Exam 2 Review

Usability Engineering in Practice

- What kind of job might a usability expert encounter?
- In 1970's, it was common to schedule user tests at end of development for client acceptance.
Results of tests:
 - Cosmetic improvements
 - Calls for additional training
 - Requirements for *future* versions

Usability Engineering in 1980s

- In 1980's, competition and faster product cycles pushed usability testing earlier into development. Two approaches.
- Separate usability groups that act as general resource to multiple development teams
 - + resource sharing, cross-product insights, organizational learning
 - communication overhead, time-sharing, prioritization

Usability Engineering in 1980s 2

- Integrate usability specialist as part of each development team
 - + tightly integrated, focused work, appreciation of project-specific constraints
 - less objectivity, hard to generalize
 - + increases likelihood that right use-related questions will be raised and addressed, immersion in problem domain
 - many companies cannot or will not afford to employ enough specialists to cover each project

Usability Engineering Now

- Usability engineers work with requirements specification along with marketing as well as in design.
- HCI identified as a core area within CS, so most CS graduates have some exposure to HCI concepts
- HCI research and graduate programs. E.g., Ph.D. - CMU, Georgia Tech, Stanford; M.S. - DePaul, IU

Cost-Benefit Analysis

- Costs - enumerate usability activities
 - Writing development scenarios, includes field work, interviews, surveys, etc., and analysis
 - Refining and reviewing scenarios
 - Developing prototypes: paper, running walkthroughs, analysis
 - Formative evaluation and analysis
 - Test lab
 - Travel, if no co-located with developers
- Generally, will it delay development

Cost-Benefit Analysis 2

- Benefits - hard to estimate, some positive outcomes usually attributed to usability engineering
 - fewer downstream changes; studies estimate that a change at prototype stage is 25% of cost of a change after installation. E.g., if assume 5 design changes of 4-8 hours to effect, then saves a week of effort.
 - reduced training and customer support

Cost-Benefit Analysis 3

- More attributed benefits
 - increased user productivity; e.g., predict typical user performance if save .5 minutes per 20 interactions per day, every day of product life; similarly with error recovery
 - customer loyalty, both repeat purchase and referrals
 - increased sales
- Example in textbook (Table 10.1, p 348): \$68K cost, \$6.8M projected savings

Internationalization and Localization

- Company can minimize costs by providing only one interface, but not a good idea
 - World is less interesting if all the same
 - Culture is like workplace environment and should be one of the contexts of use. E.g., terms like "kill" might be offensive; using picture of dog for fetch; colors; date formats
- Interface standards can help with this
- Localization is design strategy that supports systematic variation among regions and cultures

Ethical/Social Issues

- Safety - e.g., Therac-25 radiation therapy machine
 - Bad engineering with bad interface
 - Safety interlock was removed because assumed can find all software errors
 - Added complexity without documentation
 - Interface was not synchronized with internal state; error messages were not specific (same one for both too high and too low)
 - No separate testing before put into use
 - 6 people died of massive radiation burns

Ethical/Social Issues 2

- Digital Divide
 - Haves vs. have nots; functionally illiterate now includes computer use
 - Special needs; can drive improvements for all users
 - Head-mounted pointing device for hands-free operation
 - Visual enlargement for elderly
 - Audio enhancements for noisy environments
 - Elderly are the fastest growing segment of users, need more robust, simpler designs

Homework 6

- In textbook: Exercise 2 on page 301, Exercise 1 on page 339, Exercise 1 on page 360
- **Due at beginning of class on Friday** as part of Exam 2 review