

Computer/Human Interaction

Lecture 32

Overview:

- Usability Evaluation
- Types of evaluation
- Evaluations methods
 - Analytical methods

Reminder: Mid-project progress report due Friday

Usability Evaluation

- Any analysis or empirical study of the usability of a prototype or a system
- Goal is to provide feedback in software development. Answer questions like:
 - Is system sufficiently useful
 - Is it too difficult to use or learn
 - Is it not satisfying to use
 - Does it meet the stated goals
- Understand problems and causes; plan changes to correct them

Types of Evaluation

- **Formative** evaluation – done during system development. Drives redesign. Often done by asking user to verbalize thoughts during user test of prototypes
- **Summative** evaluation – done at the end of project or other checkpoint. Answers “how well did we do?” Generally done by measuring performance times and error rates.

Evaluation Methods

- **Analytical** methods – study the design/system characteristics and compare with theory, modeling, or guidelines (from experts)
- **Empirical** methods – study how **users** use system via observation, surveys, controlled experiments
- Need both: Is it a bad implementation of a good design or a good implementation of a bad design?

Evaluation Methods 2

- How to choose what methods to use?
- Which is more expensive?
- Which carries more weight with developers?

Analytical Methods

- SBD claims analysis
- Usability inspection
 - Expert walk-through based on guidelines or checklist (more than one if possible)
 - Walk-through at different levels or categories
 - List problems in each level/category, order by severity

Analytical Methods 2

- Cognitive walk-through for walk-up and use systems (e.g. ATMs)
 - Look for affordances, metaphors
 - Careful task selection, answer questions at each step: what comes next, what is assumed, are there any competing goals
- All methods use checklist forms, very popular with industry – generates lots of data for low cost

Heuristic Evaluation – Homework 5

- Nielsen (1994) gives 10 general guidelines
 - Want multiple experts
 - Want point of view (POV) of different classes of stakeholders
- **Homework 5 due on Monday**; apply Nielsen's guidelines to www.amazon.com, discuss on Monday

Model-Based Analysis

- User is modeled as a breakdown of goal identification, steps to achieve goal, implementation of steps, and selection rules
- **Predictive** model developed using scientific knowledge of human memory and behavior
 - Use model elements for mental activities
 - Like HTA, also estimate task times for alternatives

GOMS Example

- Goals, Operators, Methods, Selection rules
- Example: how to close Firefox tab

```
GOAL: CLOSE-ACTIVE-TAB
|-[select GOAL: USE-MENU-METHOD
|  |-[MOVE-MOUSE-TO-MENU-BAR
|  |  DRAG-DOWN-FILEMENU
|  |  RELEASE-ON-CLOSE-OPTION
|  ----GOAL: USE-HANDLE-METHOD
|  |-[MOVE-MOUSE-TO-INTERNAL-CORNER
|  |  CLICK-ON-CLOSE-BOX
|  ----GOAL: USE-CONTROL-KEY
|  |-[PRESS-ALT-F
|  |  PRESS-CTRL-W
```

Tradeoffs

- Usability inspections are fast and cheap BUT
 - Miss details only seen in actual use
 - Doesn't identify causes of problems
 - Emphasizes problems that are infrequent or atypical in actual use
 - Contributes little to overall HCI theory

Tradeoffs 2

- Model-based analysis has scientific foundation and is powerful and credible BUT
 - Limited to the scope of the theory
 - Time-consuming to develop
 - Ignores higher level structures of behavior