Incorporating HCI Design into Software Engineering

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CS 4570 Human-Computer Interfaces

**Overview -- Incorporating HCI Design into SE**

- Briefly revisit techniques for getting user information
- Overview of HCI Activities and where they fit into SE

**HCI Design in Software Engineering**

- Start with a clear view of what constitutes a high-quality interface
  - Speed of performance
  - Incidence of errors
  - Ability of users to recover from errors
  - Ease of learning to use the system
  - Retention of learned skills
  - Ability to customize the system
  - Ease with which user can reorganize activities supported by the system
  - Users’ satisfaction (affective response)

- High-quality HCl’s are more than putting a pretty façade on system.
- Fernando’s Guide to HCI: “It’s better to look good than to be good and you look marvelous.”
- It involves:
  - Understanding users’ limitations, abilities, motives, etc.
  - Fitting the application to the users’ task
  - Making the application’s function easily accessible and understandable
- Implication: HCI must be considered from the beginning of system development.

**Software Engineering Models**

**Life-Cycle (Linear Sequential) Model**

```plaintext
System Information Engineering

- Analysis
- Design
- Code
- Test
```

**Prototyping Model**

```plaintext
Customer Test-Device Mock-up

Customer Feedback

Build/Revise

Listen to Customer
```
Software Engineering Models

Incremental Model

Spiral Model

HCI Development Activities

- Problem Identification and Description
- Audience Description
- Task Analysis
- HCI Requirements Specification
- HCI Guideline Development
- HCI Design
- HCI Evaluation

Problem Identification and Description

- A brief one sentence or one paragraph describing the essence of what the system should accomplish

Task Analysis Examples

HCI Requirements Specification

- Answers two fundamental questions
  - “Will the system provide adequate support for user activities?”
  - “How can it be built, given constraints on cost and resources?”
**HCI Requirements Specification (Example)**

- Text
  - Text (terminology, abbreviation, fonts, styles)
  - Icons
  - Color
  - Highlighting
  - Screen-layout
  - Action Sequences
  - Command Syntax
  - etc.

**HCI Guideline Development**

- Text (terminology, abbreviation, fonts, styles)
- Icons
- Color
- Highlighting
- Screen-layout
- Action Sequences
- Command Syntax
- etc.

**HCI Design**

- **Tools**
  - Prototypes
  - Storyboards
  - Grammars
  - STDs

**HCI Evaluation**

- **"Dynamic" Evaluation**
- **"Static" Evaluation**
  - Keystroke Model Example
- Lecture on this topic later

**Sample State Transition Diagram**

- Interface Architecture, Consistency, Direct-Manipulation
- components of HCI will be the topic for the next several weeks