Chapter 17 - User Centered Design

• User centered design - involving the users of the system in the development process as much as possible so that they can influence the design.

• Fundamentals
  – First Step - Understanding the requirements for your product.
    • Looking at similar products
    • Understanding the needs of the users
    • Analyzing existing systems for flaws
    • Jug Example
  – Representing your design
    • Model - representation of a system or design
• Models
  – Uses:
    • communication
    • exploring the problem space (simulations)
  – Considerations
    • Who is going to be using it?
    • How it is going to be used?

The Design of Software Systems

• Waterfall Model - Linear Process
  – Develop requirement specification
    • Serves as a contract between developers and clients
  – Develop formal representation of the system
  – Implementation process
    • Includes: programming, testing, and documenting
  – Final product is verified by clients
  – Operation and Maintenance (after accepted)
– Problems with Waterfall Model
  • Application description and requirements specification usually ambiguous
  • Initiated by corporate or management level
  • Leaves much of the work up to operation and maintenance stage of development.

• Prototype Approach
  – Better user feedback
  – Possibly no end to the process

• Spiral model
  – Includes stages of the waterfall model
  – Incorporates the following before each stage:
    • Prototyping
    • Risk analysis
    • Evaluation

• W model
Examples of User Centered Design

• 1984 Olympic Messaging System
  – Initial analysis of requirements
  – Printed scenarios of user interfaces
  – Wrote user guidelines explaining what it did and how it worked
  – Simulations of actual device
  – Tours of Olympic Village, early demonstrations of the system, and interviewed different people involved with the Olympics
  – Ex-Olympian as part of the design team
  – “Hallway” and “Try-To-Crash-It” Tests

• Principles of user centered design used
  – Focus on users and their tasks early on in the design process
    • Keeping in mind cognitive, social, and attitudinal characteristics
  – Measure reactions by using prototypes, interfaces, and other simulations
  – Design iteratively
    • Keeping users involved
• **Air Traffic Control System**
  – Evaluated the controllers tasks to develop first cut design
  – Built an initial system and tested it on location
  – Identified local requirements
  – Concept testing and user feed back
  – Developed an upgraded prototype
  – “Road Show”
  – Developed a system specification

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**The Scope of System Design**

• User factors to be taken into account

• Kind of system
  – Bespoke vs Generic
  – New system vs Old system
  – Size and Complexity
    • User developed applications
    • Large Projects
  – Constraints
    • Real time and mission critical systems