Designing for the User

GMU Fall 2019 CS 321

Connor Baker

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Review of Previous Class

- How are Scrum and XP different?
  - Scrum is focused on management and workflow
  - XP is focused on rituals and practices surrounding programming
- What are the stages of the Software Development Life Cycle?
  - Specification
  - Design and implementation
  - Validation
  - Evolution
- Requirements
  - They strike a balance between features and security
  - Capture the expected functionality of the system
  - They address the “what”s levied at a system, not the “how”s
- Agile really wanted to get away from waterfall
  - That included verbiage
  - That’s why they use terms like “feature” instead of “requirement”

Motivation

- Limited short-term memory
- People make mistakes
  - Don’t penalize them for it
- People are different
- People have different interaction preferences

Usability

ISO Definition

Usability is

> the extent to which a system, product or service can be used by specified user to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use – ISO 9241-11

Usability is about the quality of user experience which includes how easy it is to use and how useful that system is.

Usability includes:

- Easy of learning
- Efficiency
- Errors
- Memorability
- Satisfaction

Interaction Design

> The practice of designing interactive digital products, environments, systems, and services – About face 3: The essentials of interaction design, Cooper, Reimann, Cronin, 2007

It is **not** software design. Developing a user interface involves:

- Interaction component
  - How a user interface works, its “look and feel” and its behavior in response to what a user hears, sees, and does
- Interface software component
  - Code which implements the interaction component

Design Issues

- Two problems must be addressed in the interactive systems design
  - How should information from the user be provided to the computer system?
  - How should information from the computer system be presented to the user?
- A coherent user interface must integrate user interaction and information presentation

Design Principles

User familiarity The interface should use terms and concepts which are drawn from the experience of the people who will make most use of the system.

Consistency The interface should be consistent in that, wherever possible, comparable operations should be activated in the same way.

Minimal surprise Users should never be surprised by the behavior of a system.

Recoverability The interface should include mechanisms to allow users to recover from errors.

User guidance The interface should provide meaningful feedback when errors occur and provide context-sensitive user help facilities.

User diversity The interface should provide appropriate interaction facilities for different types of system user.

Error Messages

Error message design is critically important. Poor error messages can mean that a user rejects rather than accepts a system.

Messages should be polite, concise, consistent, and constructive.

The background and experience of users should be the determining factor in message design.

Interaction Design Process

- Interaction design is an iterative process involving close liaisons between users and designers.

The three core activities in this process are:

- User analysis
  - Understand what the users will do with the system
- System prototyping
  - Develop a series of prototypes for experiment
- Interface evaluation
  - Experiment with these prototypes and users

Ethnography

- Involves an external observer watching users at work and questioning them in an unscripted way about their work
- Valuable because many user tasks are intuitive and they find these very difficult to describe and explain
- Helps to understand the role of social and organizational influences on their work

User Interface Prototyping

- The aim of prototyping is to allow users to gain direct experience with the interface
- Without such direct experience, it is impossible to judge the usability of an interface
- Prototyping may be a two-stage process:
  - Early in the process, paper prototypes may be used;
  - The design is then refined and increasingly sophisticated automated prototypes are then developed

Interface Evaluation

Interface evaluation is the process of assessing the usability of an interface and checking that it meets user requirements.

Simple Evaluation Techniques:

- Questionnaires for user feedback
- Video recording of system use and subsequent tape evaluation
- Instrumentation of code to collect information about facility use and user errors
- The provision of code in the software to collect on-line user feedback

Other Resources

- About face 3: The essentials of interaction design, Cooper, Reimann, Cronin, 2007 [Available on Safari Books Online through GMU Library: https://proquest.safaribooksonline.com/book/web-design-and-development/9780470084113]
- https://www.nngroup.com/articles/
- https://www.youtube.com/watch?v=yY96hTb8WgI