Chapter 3

Managing Design Processes

Outline

- Introduction (usability engineering)
- Three pillars of design
- Development methodologies
- Ethnographic observation
- Participatory design
- Scenario development

Usability Engineering

- Usability engineering is a systematic approach to making software easier to use for the individuals who actually use it to get their work done.

- Like software engineering, it is an evolving science that determines best practices and continually tests and refines its techniques.

The Three Pillars of Design

1. Guidelines documents and processes
2. User-interface software tools
3. Expert reviews and usability testing

Guidelines documents and processes

- Early in the design process, the UI architects should generate a set of working guidelines

- Each project has different needs, but guidelines should be considered for:

- Words, icons, and graphics
  - Terminology, abbreviations, and capitalization
  - Character set, fonts, font sizes, and styles
  - Icons, buttons, graphics, and line thickness
  - Use of color, backgrounds, highlighting, and blinking

► Guidelines documents and processes

- **Screen-layout issues**
  - ☐ Menu selection, form fill-in, and dialog-box formats
  - ☐ Wording of prompts, feedback, and error messages
  - ☐ Justification, white space, and margins
  - ☐ Data entry and display formats for items and lists
  - ☐ Use and contents of headers and footers
- **Input and output devices**
  - ☐ Keyboard, display, and pointing devices
  - ☐ Audible sounds, voice feedback, touch input, …
  - ☐ Response time for a variety of tasks
  - ☐ Alternatives for users with disabilities

► Guidelines documents and processes

- **Action sequences**
  - ☐ Direct-manipulation clicking, dragging, dropping, and gestures
  - ☐ Command syntax, semantics, and sequences
  - ☐ Shortcuts and programmed function keys
  - ☐ Error handling and recovery procedures
- **Training**
  - ☐ Online help and tutorials
  - ☐ Training and reference materials

Recommendations for guidelines documents

- Records decisions for all parties to see
- Promotes consistency and completeness
- Facilitates automation of design
- Allows multiple levels:
  - Rigid standards
  - Accepted practices
  - Flexible guidelines
- Announces policies for (4 Es):
  - Education: users need training
  - Enforcement: a process to verify that an interface adheres to the guidelines
  - Exemption: room for creative ideas and new technologies
  - Enhancement: reviewing and improving the guidelines

User-interface software tools

- One difficulty in designing interactive systems is that users may not have a clear idea of what the system will look like.

- It is difficult, costly, and time-consuming to make major changes to systems after implementation

- There is no complete solution to this problem but it can be reduced by developing ***prototypes***.

- Many tools are available for developing prototypes at different levels…

- Details discussed in Chapter 5.

Expert reviews and usability testing

- As rehearsals are necessary for theaters, different tests are necessary for aircrafts designers, expert reviews and usability tests are necessary for interactive systems

- Details discussed in Chapter 4

Developmental Methodologies

The Logical User-Centered Interactive Design Methodology (LUCID): http://www.cognetics.com/lucid/

1. **Envision**: Develop product vision
2. **Discovery**: Study users (user and task analysis)
3. **Design Foundation**: Develop a conceptual design and look
4. **Design Detail**: Complete specifications
5. **Build**: Implementing
6. **Release**: Develop rollout plan; evaluation of installation process

LUCID Stage 1: Envision

- Develop a clear product vision in agreement with stakeholders – a brief statement that defines the goals, functionality, and benefits of the product.
  - Achieve common vision from stakeholders
  - Identify major user groups
  - Establish preliminary usability goals
  - Understand constraints (technical, schedule, and resources)
  - Establish project plan

- The Envision stage is complete when...
  - All stakeholders and team members understand their roles and the project vision, and roles and vision have been documented.

LUCID Stage 2: Discovery

- Analyze users, tasks, and information

- Develop requirements

- Techniques:
  - Interviews, contextual inquiry, usability tests, etc.

- The Discovery stage is complete when...
  - Personas, scenarios, and high-level requirements are approved

LUCID Stage 3: Design Foundation

- Establish the basic concept of the user interface, its objects, and its metaphors
  - ☐ Create the conceptual design
  - ☐ Create a key screen prototype that can be tested with users and then approved by management.

- The Design Foundation stage is complete when...
  - ☐ Executive management approves the design direction, embodied in a key screen prototype

LUCID Stage 4: Design Detail

- Complete the user interface design, producing specifications for developers

  - Complete a style guide containing both the graphic design and UI policy decisions.

  - Conduct usability evaluations of specific screens or workflows.

  - Create detailed layouts for each screen and detailed specifications for each element of each screen.

- The Design Detail stage is complete when...

  - Specifications are complete, reviewed, and turned over to developers

LUCID Stage 5: Build

- (Developers) implement and test the product, make it ready for release

  - Answer questions and support developers during coding, redesigning screens if needed.

  - Conduct usability evaluation of critical screens, if necessary.

- The Build stage is complete when...

  - Development is complete and the product is tested and ready for release

LUCID Stage 6: Release

- Design and test the out-of-the-box user experience.
  - Develop a rollout plan.
  - Conduct usability evaluation of the installation activity and of the released product.
  - Measure user satisfaction.

- The Release stage is complete when...
  - All measurement activities are complete and remaining usability issues have been transitioned to new projects

Ethnographic Observation

- **What is Ethnography?**
  - Participant observation: joining work or home environments to listen and observe carefully to understand individual behavior, work, and organizational context. It may involve asking questions and participating in activities
  - From anthropology (may continue for weeks and months)
  - For user-interface design, it may continue for days or even hours
- **Disadvantages:**
  - It is easy to misinterpret observations and to overlook important information. Also difficult to use the generated data

Guidelines for Ethnographic observation

- **Preparation**
  - ☐ Understand organization policies and work culture.
  - ☐ Familiarize yourself with the system and its history.
  - ☐ Set initial goals and prepare questions.
  - ☐ Gain access and permission to observe/interview.

- **Field Study**
  - ☐ Establish rapport with managers and users.
  - ☐ Observe/interview users in their workplace and collect subjective/objective quantitative/qualitative data.
  - ☐ Record your visits.

► Guidelines for Ethnographic observation

■ **Analysis**

☐ Compile the collected data in numerical, textual, and multimedia databases.

☐ Quantify data and compile statistics.

☐ Reduce and interpret the data.

■ **Reporting**

☐ Prepare a report and present the findings.

Participatory Design

- **What is participatory design?**
  - ☐ Designers and users communicate about proposed designs
  - ☐ Shared representations of screens etc.
 - ☐ Co-design using simple tools such as paper or video scenarios

Participatory Design: Controversy

■ On the positive side, more user involvement brings

- ☐ more accurate information about tasks
- ☐ more opportunity for users to influence design decisions
- ☐ a sense of participation and ownership in users
- ☐ potential for increased user acceptance of final system

► Participatory Design: Controversy

■ On negative side, extensive user involvement may

- ☐ be more costly

- ☐ lengthen the implementation period

- ☐ build antagonism with people not involved or whose suggestions are rejected

- ☐ force designers to compromise their design to satisfy incompetent participants

Participatory Design: Level of participation
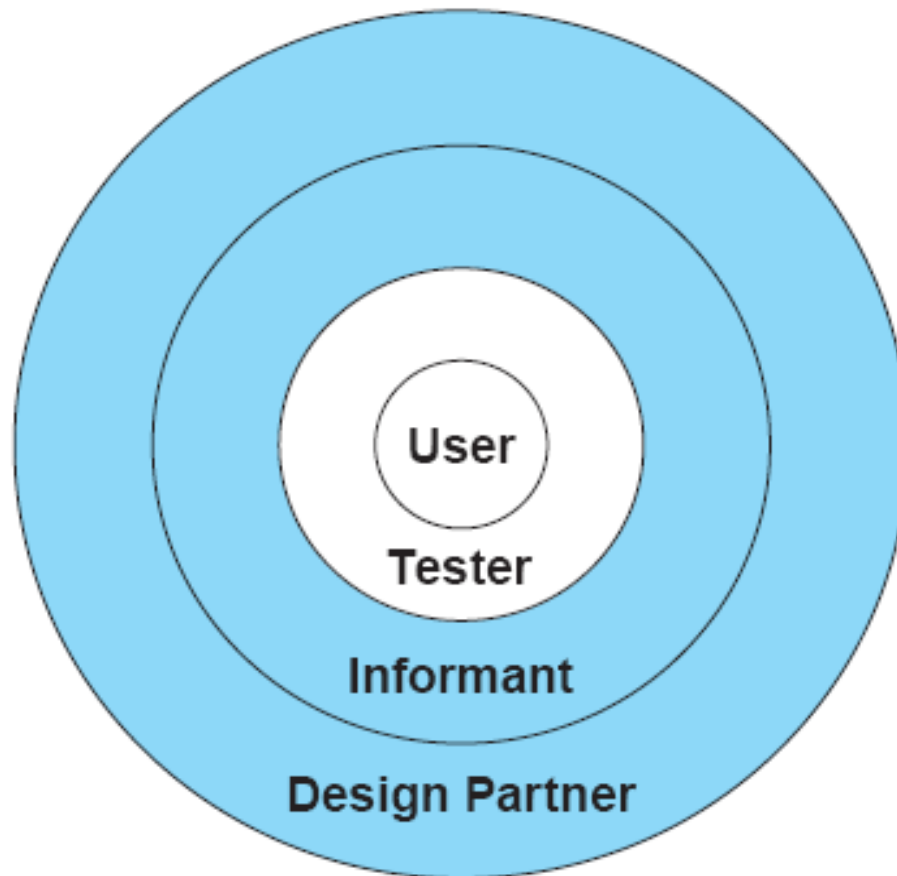
Scenario Development

- Story like descriptions about the usage of the system

- Represent typical tasks

  - can represent common or emergency situations with both novice and expert users

- Many uses of scenarios:

  - task description

  - basis of evaluation

  - marketing

- Tasks descriptions (more formal than scenarios)

  - use-cases (often used these days)

  - transition diagrams

  - flowcharts

Skipped Sections

The following sections have been skipped:

- 3.2 Organizational Design and Support Usability

- 3.8 Social impact statement for early design review

- 3.9 Legal issues