Notes for Class 3: Process of Interaction Design & User Centered Design

Objectives
By the end of the class, you will be able to…
• Describe the major steps in the interaction design process
• Explain the importance of iterative design and evaluation
• Explain the benefits of involving users in design
• Explain why rapid prototyping techniques are useful
• Explain how you would apply your knowledge about the design process to a particular example application.

Agenda for Class
• Discussion of air traffic control example from Chapter 19. This provides an overview of a complete UI design process.
• Process design activity: Apply what you have learned from the case study in the reading assignment to a different application.

Reading Assignment
Textbook Chapter 19 (pp. 387-409) and Chapter 1: 4-6 (pp. 15-24)

Notes:
(Note: many of these notes refer directly to the FAST case study in chap. 19).

Definitions:
• Iterative Design – an approach to user interface design that involves cycling through design and evaluation activities a number of times.
• User Centered Design – an approach to interface that views knowledge about intended users as a central concern. Includes knowledge about users’ abilities & needs, their tasks, and their environment. Users are also actively involved in the design process.
• Interaction Design - a field and approach to designing interactive experiences. Notice that interaction design (or ID) involves more than simply designing a user interface. Rather, you design the complete user experience, of which the interface is only a part (albeit an important one).

What is the difference between a waterfall software design process and an interaction design process?
• Interaction design emphasizes iteration. Stages of design, implementation, and testing are not independent. Feedback is continually obtained from users and incorporated into the design.

Who are the target users of FAST?
Air-traffic controllers
Other stakeholders in the FAST project:
  - London area terminal control centre (LATCC) – customer who financed the product, also the end user. Many different roles in this organization (end users, managers, people responsible for financing, etc).
  - People who work at airports or ride in airplanes

Major stages in the design of FAST:
  - Requirements gathering
  - UI design / prototyping
  - Evaluation

**Requirements**

How did the FAST team determine requirements for the project? Why was their method of requirements gathering effective?
  - Observation of controllers performing their tasks
  - Interviews with controllers, individually & in groups
  - Hierarchical task analysis. Verified these hierarchical task breakdowns with the users.
  - Effective because they used multiple methods of data collection (increases validity of findings) and verified their task descriptions with the users

What factors did the team consider when identifying requirements?
  - Air Traffic controllers – their experience, demographics, personalities
  - Tasks – carefully define task this tool will help people accomplish
  - Environment – physical environment, noise, communication methods, breaks
  - Usability requirements

**Design & Prototyping**

User centered design is introduced at the beginning of section 5. Why was the design of FAST considered to be “user-centered”?
  - Focus on the users and their tasks
  - Regular involvement of the users in the design process

In what ways was a user-centered approach beneficial to the project?
  - Commitment to adoption by the end users (p. 397 Richard, an ATC, comments that he didn’t think the tool was needed until he got involved in designing it. He thought controllers were doing their job just fine with current techniques. He changed his mind in the later quote.)
  - Product that works more effectively because the intended users and tasks are well understood.
  - Product contains very useful ideas that the designers did not think of themselves.

How did the FAST team prototype their designs?
  - Several rounds of paper prototypes (several months!)
  - Microsoft Powerpoint prototype that showed animation sequences
C++ prototypes, designed to be easy to alter

Why were the early prototypes not implemented using a programming language? Do you think this approach to prototyping was effective? Why / Why not?
  - Quickly experiment with different design ideas
  - Identify main usability problems without investing much effort in programming

How did the FAST design team get feedback on their early prototypes, to improve their designs?
  - Sessions with users, where they did structured walkthroughs, observed interactions with the prototypes, and held discussions.

Some parts of the FAST C++ prototype were kept while others were thrown away and re-implemented in the final product. Was this a waste of time? Why or why not?
  - The team felt it was an effective use of time because the prototypes were designed in a way that made them easy to change quickly. This enabled them to try out a wide variety of designs and get the design right so it only had to be implemented once.

**Evaluation**
The FAST team conducted fairly extensive user evaluations of their later, more developed prototypes. What major activities did they do during their evaluation sessions with users?
  - Observe the controllers doing their tasks with the prototype interfaces.
  - “Debriefing sessions” where they discuss the controller’s responses to the designs.
  - Have the controllers fill in questionnaires at the end of evaluation sessions.
    (System usability, workload, etc)

In addition to evaluation with users, the FAST team evaluated the user interface using “inspection” techniques (that did not involve users). Why did they do the evaluation both ways?
  - Impossible to do inspection alone – you are not a user and can’t fully predict what a user will do
  - But, inspection can catch a number of usability problems more quickly than user evaluation.

**Key Concepts for Today:**
1. Iterative design and evaluation are critical to developing a successful interface.
2. Involving users in design and evaluation is important for both usability and acceptance of the final product.
3. Rapid prototyping techniques enable you to quickly test design ideas, saving time overall.
Sample Test Questions to Help You Study

1. Today’s class activity is an excellent sample exam question. Revisit these questions after we have looked at requirements analysis, prototyping, and evaluation in greater depth.

2. Imagine a product design team does a few quick sketches of their interface and then begins implementing their product. Explain why this is a poor process, giving examples of problems the team is likely to encounter.