

## First Exam

October 4th 2005

Length: 75 minutes – Total points: 100

*(The grader reserves the right to take off up to 3 points for poor handwriting ... so write neat!).*

1. Imagine a company wants to create an interface that lets the employees automatically order lunch. The company is rather big and has several hundred employees, plus each month there are visitors and interns that work at the company, from a few days to a couple of months. Also, not everybody is going to order lunch everyday, there are some people that tend to bring their own meals but once in a while they order lunch through the system and there are employees who use the system every day. Describe the three different kind of users as discussed in chapter 1 the company has to accommodate for this interface, what is typical for each user type and how should the interface address this?

12 Points

Naming and describing all three correctly 4 points each (pages 67/68)

- novice/first time users (guests, interns):  
little knowledge of task or interface, might know the task but not the interface;  
simple interface, limited vocabular, small number of actions, informative feedback, good manuals, tutorials, video demonstrations
- knowledgeable intermittent user (people that order fairly often):  
know several interface, mostly good idea about the task (stable task concept) but lacking detailed knowledge of interface;  
consistent menus, terminology, recall rather than recognition, meaningful messages, guides to frequent patterns, consistence sequence of actions
- expert (employees that order everyday):  
very familiar with the system and task, one to get the job done quickly, willing to write macros or similar;  
rapid response time, brief and non distracting feedback, shortcuts, strings of commands, abbreviation, macros
- children/ young adult user
- older adults
- international user

2. Life-critical systems:

6 Points

3 points for a) and 3 points for b) (page 17)

- a) Describe the characteristics of a Life-critical system and its uses.  
*answers:* expensive, reliable, might require long training to achieve rapid, error-free performance
- b) What are typical areas that depend on Life-critical systems? (Name 4 examples)  
*answers:* air-traffic, military, nuclear reactors, police, firefighters, medical services, power utilities

3. Name and Describe the three Pillars of Design.

12 Points

4 points for correct naming and describing of each pillar (p. 114ff)

- Guidelines Documents & Process  
provide a clear set of guidelines how the interface should be designed with respect to (at least):
  - Words, icons, graphics
  - Screen-layout

- Input and output devices
- action sequences
- training
- User Interface Software Tools
  - give customers and users a realistic idea of what the UI is going to look like, rapid prototyping, paper mock ups, printed interfaces, Flash, VB, Director, could use PL to quickly implement a prototype
- Expert Reviews & Usability Testing
  - subject experts reviewing a product, controlled user tests, have to happen continuous during the design process to find problems and errors early in the development, pilots, cognitive walkthroughs, user experiment

4. Discuss the topic of direct manipulation, briefly describe what it means and what the benefits and drawbacks of direct manipulation are?

10 Points

4 points for describing, 3 points for advantages and 3 points for disadvantages. (p. 259)

- visual representation, easier to remember, immediate visibility of results
- less syntax -> lower error rate, possible to prevent errors, faster learning, fosters exploration, 'intuitive'
- system resource intense, repeated actions can become cumbersome (copy 500 folders), history difficult to implement and represent

5. You are redesigning the feedback messages for an application. There are three types of messages: notifying messages (information for the user, no immediate response necessary), critical messages (user response needed), urgent messages (user needs to respond immediately). How would you design the different messages? How would you address the issue of getting the users attention relative to the urgency of the message? Describe and justify a different highlighting scheme for each, you can use drawings to explain your decisions.

20 Points

description that names and describes at least 6 of them (page 64)

- *Intensity*: two levels only, limited use of high intensity
- *Marking*: underline, enclose in boxes, point to items, use indicators such as asterisks or dashes etc.
- *Size*: up to 4 sizes, large draws more attention
- *Choice of Fonts*: limited to 3 fonts
- *inverse video*: use inverse coloring
- *blinking*: 2-4Hz frequency blinking displays or blinking color changes (great care and only limited use!)
- *color*: 4 standard colors, one reserve color
- *audio*: soft tones for regular positive feedback, harsh ones for emergencies

6. The company *Singing Bottle* approaches you and wants you to design a hiker's water bottle with an integrated music player. Describe the process of designing this device. In detail talk about the different stages of this process and the term 'design cycle' and why it is called so? You can refer to the LUCID design principles or other descriptions of the stages of the design process.

20 Points

describing the iterative nature of the design process, starting with a problem or task and developing the different phases in reaching a final product, these are in a broad sense (not limited to and no strict definition): (p.119ff)

- Problem/Analysis
  - what is the task, problem to solve (could be the old version of a product to start with or a completely new task, problem)
- Definition
  - clearly define the problem so that key aspects are distinguishable

- Ideation  
brainstorm, discuss the problem and come up with several possible solutions
- Idea Selection  
select one solution that is going to be pursued
- Implementation  
implement the the solution that turned out to be best
- Evaluation  
do evaluation(s) on the product
- Acceptance  
after shipping the product, monitor its acceptance and see if there is more input that might help for a new version and how users react

7. *Singing Bottle* furthermore asks you to propose details for a usability test to be conducted for the the hiker's music playing water bottle. You have a time frame of two weeks for running the study and evaluating the data and a maximum of 15 subjects should be tested. Describe what is tested, who are the subjects that are tested, what are the different parts of the usability test, what legal issues (user rights) have to be taken care of and how does the actual usability test work.

20 Points

- test for durability, easiness of use, subjective user feeling, usefulness in eyes of the user
- possible subjects: idea of personas, hikers, people who exercise, bikers
- introduction to the test, script for briefing, debriefing, working with different variables (dependent, independent, controlled variables), surveys, questionnaire, briefing, debriefing
- users rights, consent, IRBs
- description of the whole test (greeting, consent form/ rights info, briefing, test, survey/ questionnaire, debriefing, payment)