The Design of Interactive Computational Media

Class 2: 18 Sept. 2002

Approaching The Design Problem

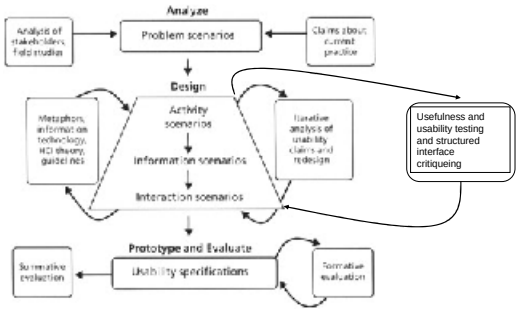
Hour 1: Design and the Design Problem

Hour 2: Working Well in a Group

Design and The Design Problem

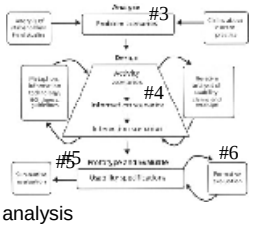
- A design method
- Project stages
- The design problem
- Past design problems and sample solutions
- Thoughts about design
- Brainstorming

Design Method



Design Method and Design Project

- Teams of four or five



- Assignment 1: Brainstorming
- Assignment 2: Proposal
- Assignment 3: Requirements analysis
- Assignment 4: Activity design; information design
- Assignment 5: Interaction design; prototyping
- Assignment 6: Usefulness and usability evaluation
- Assignment 7: Oral presentation

Project Stages

- Stage 1 — Brainstorming ideas
- Stage 2 — Group formation; brief description of idea
- Stage 3 — Requirements analysis based on work with users; description of current practice via “Day in the Life” “Problem Scenario”
- Stage 4 — Design of functionality (activity design) and information display; description of proposed usage via “Day in the Life” “Activity Design Scenario”
- Stage 5 — Interaction design; design and construction of system prototype illustrating its functionality and look-and-feel
- Stage 6 — Usefulness and usability evaluation of prototype; review and synthesis of entire experience

This Year’s Design Problem (Review)

- Design for senior citizens
- Needs illuminated by taxonomy by Maslow
  - Biological/physiological needs
  - Security needs
  - Social needs
  - Ego needs
  - Self-actualization
- Heuristics
  - Sensory modalities
  - Spaces
  - Everyday objects
  - Tools and instruments

Solving Design Problems

- Apple Computer Student Design Project Competition
- Begun in 1992 and run through 1995 by S. Joy Mountford, Manager, Human Interface Group, Apple Computer
- Roughly 10 universities participated each year — Toronto most regular participant through 1995, along with CMU

Some Past Design Problems

- Design a family of 3 scalable computers with consistent look-&-feel useful for some application (Apple 1992)
- Design an adaptive interface useful for some application (Apple 1993)
- Design an educational application for some handheld device connected to the Internet (Apple 1994)
- Bridge the gulf between the physical world and the virtual world (Apple 1995)
- Design interfaces for sound, music, speech (Interval 1995)
- Design interfaces for "atypical users" (recent 318S)

Apple 1992 Design Problem & One Solution

- Design a family of at least 3 scalable computers with consistent look-and-feel & useful in application domain
- A Toronto winner — The Apple Scholar
  - Integrated family: Notepad (+Scribe), Studybook, Librarian
  - Practicality in 2-3 years (although still ahead of it's time)
  - Understanding users & user needs — Designers were students
- *** VIDEO highlights***
  - Statement of need/problem and statement of solution
  - "Problem Scenario"
  - Activity Design Scenario
  - Design process

QuickTime™ and a Sorenson Video decompressor are needed to see this picture.

Apple 1993 Design Problem & One Solution

- Design an adaptive interface useful in some application
- Toronto winner — GloBall
  - A ball that responds to the actions of the children who use it
  - Wizard of Oz prototyping
- *** VIDEO highlights***
  - "Problem Scenario" (thin)
  - "Activity Design Scenario"
  - User testing results

Apple 1994 Design Problem & One Solution

- The problem — Design an educational application of "hand-held" computers connected to the Internet
- Toronto winner — Project Galen
  - A system for peripatetic nurses, e.g., Royal Victorian Nurses
  - Assists in home patient care and patient education
- Video of presentation at Apple unavailable
  - Understanding users and their needs
  - "Day in the life" demonstration of the system
  - User interviews and user testing

Apple 1995 Design Problem & One Solution

- The problem — Bridging the gulf between the physical and the electronic worlds
- Toronto winner — Project Footprint
  - Electronic guide for the Royal Botanical Gardens
  - Device that displays information (a virtual explanatory signs) when it is near physical objects, i.e., plants, trees, etc.
- *** VIDEO of Apple presentation highlights***
  - Needs analysis, understanding environment
  - Some "Activity Design Scenario"
  - User testing
  - Hardware design prototyping

QuickTime™ and a Sorenson Video decompressor are needed to see this picture.

Thoughts about Design (1)

- Design requires brainstorming and creative insights
- Design is conscious, can be done systematically
- Design keeps human concerns at the center
  - Design involves a conversation with your users
- Design involves a conversation with your materials
- Design involves interaction between these two conversations
  - Design is infinitely improvable, i.e., design must be iterative

Thoughts About Design (2)

- Design has social consequences
- Design is a social activity and occurs in a context such as that of an organization or a society
- Design should involves contributions from many disciplines
  - Computer science
  - Domain expertise
  - Behavioural science — psychology, sociology, anthropology
  - Design disciplines — graphic design, industrial design, animation, cinematography, video, music

Brainstorming

- Idea generation methods to get started — think about...
  - What users do
  - What problems users encounter
  - What users want or need
- Think about capabilities of new computational media
- Throw out ideas and then...
  - Play with them
  - Constructively criticize them
  - Modify them
  - Combine them
  - Etc., etc., etc.

Questions and Discussion

Class Discussion

- *Recall a class with a group project … or a team project at your place of employment …*
- *What made the group successful?*
- *What were the major problems encountered?*

Break

Working Well in a Group (Second Hour)

- Typical group problems
- Group formation
- Arranging, attending, and managing meetings
- Brainstorming
- Achieving open communication
- Dealing with interpersonal conflicts
- Dealing with difficult people
- Interacting non-defensively

- Some material in these notes adapted from Lil Blume, with thanks

Typical Problems (small sample)

- 30%: Difficulty contacting group members
- 25%: Failure of some to do what they've promised
- 30%: Feeling that you had to take leadership role to get anything done
- 20%: Failure to divide tasks fairly
- 25%: Insufficient brainstorming
- 25%: Misunderstandings due to poor expression / poor listening
- 25%: Difficulty accepting feedback from others

Discussion

- *Anything that we've missed?*

Group Formation

- Harnessing complementary skills
  - Writing, research, technology, marketing, finance, leadership, organization, domain expertise
  - Form includes information on expertise
- Ensuring compatible goals
  - Expectations for the course, e.g., grade
  - Work styles, e.g., slow and steady progress vs. last-minute all-nighters
- Forestalling difficulties in contacting members
  - One of the biggest problem in the past

Arranging and Attending Meetings

- Contacting people and arranging meetings
  - Form included with Assignment 2 includes complete contact info for all team members
  - Stay in touch every day
  - Inform team if you need to go out of touch
- Attending meetings
  - All have obligation to attend, unless agreed otherwise
  - Arrange next meeting at current meeting

Managing meetings (1)

- Ensuring that meetings accomplish something in a reasonable amount of time
- Form that will be included with Assignment 3 encourages structuring meetings with specific roles, including facilitator, scribe, and timer
  - Try to rotate roles
- Facilitator must have absolutely clear purpose for the meeting, most communicate this to all

Managing meetings (2)

- Keep meetings as brief as possible
- Record results of meetings, follow-up required, and responsibilities
- Leaders and followers … both OK roles
- If someone screws up, do whatever damage repair is needed and move on

Brainstorming

- Techniques
  - Give everyone a chance to suggest ideas
  - Disallow criticism during initial phase
  - Encourage freewheeling … no idea too crazy
  - Encourage quantity and variety of ideas
  - Encourage combinations and improvements
  - Do not follow any suggestion too rigidly
  - Have one group member take notes
- Brainstorming required to choose basic idea, also for all aspects of the design throughout the term

Open Communications

- Making suggestions — no idea too crazy
- Understanding suggestions that aren't clear
  - "I'm not sure I understand ….. could you please explain it again"
  - "Could you draw me a picture?"
  - "So you're saying ….. Do I understand it correctly?"
- Dealing with suggestions that have been ignored
  - "I can see your point ….. but let me repeat my idea ….. perhaps you can tell me why it won't work"
  - "I really won't feel right going ahead with that unless we consider my idea as well"

Understanding Interpersonal Conflicts

- What is the other person trying to say?
- What do I not know about this situation?
- Do we still have a shared goal? What is it?
- Are my expectations realistic?
- Am I presenting my concerns clearly? If not, how can I do so?

Resolving Interpersonal Conflicts

- State your opinion or your concerns as clearly and assertively as possible
- For example, if there is a behaviour you find problematic:
  - Explain what it is
  - Offer your interpretation of the behaviour, giving the other person the benefit of the doubt
  - Explain the consequences of the behaviour
  - State your goal clearly, for example, a request to change the behaviour

Varieties of Difficult People

- The tank
- The sniper
- The grenade
- The know-it-all
- The think-they-know-it-all
- The yes person
- The maybe person
- The nothing person
- The no person
- The whiner

Class: Describe some of these

Dealing with Difficult People

- Listen carefully and try to understand
- Process what you've heard and try to reach a deeper understanding
- Assume the best, give the benefit of the doubt
- Formulate your response thoughtfully
- Speak carefully to be understood
- Try to avoid putting people on the defensive

Examples of Defense-Provoking Statements

- You're doing that wrong.
- It's your fault.
- You're an idiot.
- If only you had listened to me in the first place.
- How did you ever make it to third year?
- You should … (when advice not requested)
- We're going to … (when other person not consulted)

Defensive Responses

- Quit harrassing me.
- It's not my fault.
- It's late because I had three other assignments due.
- I would have done it if you hadn't changed the rules.
- Do it yourself, then.

- Results when this happens
  - First person can get defensive …
    - Well it's not my fault.
    - But you're always late.
    - As I said, thanks to you we're screwed.
  - A spiral of heightened emotions and negative feelings.

Non-Defensive Responses

- Paraphrase: You wanted this an hour ago, eh?
- Clarify: Are you concerned about content or format?
- Agree: You're right. I've been slow.
- Name the behaviour: You're yelling. Do you mean to?

- Bottom line
  - Don't make defense-provoking statements: Name the situation, instead of calling a team member a name
  - If you are attacked, try to respond non-defensively; responding defensively will just make matters worse.

Summary: Effective Group Process

- Complementary expertise
- Shared goals and values
- Clear statements of expectations and commitments
- Open and honest communication, especially in times of stress and difficulty
- Agreed-upon method(s) for and commitment to timely decision making
- Recognize conflict and try to deal with it promptly
- Some people will be difficult; you will have to cope
- Defense-provoking statements and defensive responses make matters worse

Questions and Discussion