Class 9, November 7th, 2000
Tuesday, November 7th, 2000

Human-Computer Interaction
IT 113, 2 credits
First trimester, both modules 2000/2001

1. Questions and Quiz
2. Nomadic Radio: Final Comments
3. CHI 2000 Live UI Design Competition
4. Overview of the Selected Design Projects
5. Example of a Contextual Analysis
6. Contextual Analysis: Specific Hints and Assignment for Class 10
7. Video on Multimodal Interaction and Discussion

CHI 2000 Live UI Design Competition
Conditions and Problem

Conditions
- Each team first hears about the problem on stage
- They discuss and work out a high-level design, using flip charts
- Time limit: 10 minutes

Design problem
- You are to design an airport food vending machine for the year 2005
- The machine will dispense a variety of prepackaged food items including candy bars, potato chips, as well as three freshly brewed hot beverages (tea, hot chocolate, coffee) that are created on demand
- Design how users purchase and select the items(s) they want to buy
Contributions of the Four Teams (1)

Razorfish
The team spent 5 of the 10 minutes discussing the properties and requirements of the likely users
Main design idea: Use mobile phones as interface device
They agreed with each other too much, fixating relatively quickly on a particular type of design

University of Malmö (student team)
They also began immediately with a focus on the users
They brainstormed in a relatively evaluative fashion
Presumably, because of the time limit, they felt it necessary to combine brainstorming and evaluation of ideas
Their input device: U’s boarding pass
More than other teams, they tried to keep considering children as part of the user group

Contributions of the Four Teams (2)

IBM (The Big Blues Brothers)
• They worked silently and in parallel during the first couple of minutes
  Apparently they had agreed in advance to do so
• The technologist proposed various advanced input modalities
  • Eye gaze
  • Speech input and output (for users from many different countries??)
• Should U be able to see the food itself or just to see descriptions?
  Let’s ask the users (quick show of hands)

Sapient
• Again, much focus on user requirements
• Extended questioning of the audience (about 4 of the 10 minutes)
  A highly efficient way of getting user information
• Basic interaction style: question-answer dialog (!?)
  Not much liked by judges, partly abandoned in the end
General Comments

General comments (AJ)

- All teams rightly focused a lot of attention on user requirements at the beginning
- Each team structured the process into several phases, each involving different types of information
  E.g., "Brainstorm", "Provoke", "User Purpose", ...
- All of the resulting designs were rather poor
  Too complicated, too much use of fancy new technology
  The designers seemed anxious to get away from existing designs, some of which already come quite close to the ideal

Final rank

1. Sapient
2. IBM
3. University of Malmö
4. Razorfish

Contextual Analysis: Specific Hints

Who Is to Be Involved? (1)

Who should go?

- Developers definitely!
- UI designers
- Usability people
- Documentation people (often very good at this)
- Testers

Whom should we talk to?

- Go for different people, not similar people
- Start with the heavy users first
- Start with the people you think will be the biggest customers
- Interview the people you know least about
- Make sure you get to the people who actually do the work
- Also talk to indirect users, such as supervisors
Who Is to Be Involved? (2)

Assignment 1

(See Assignment 2 below)

Alternative Information Sources

What to do if you can’t talk to the customers themselves

They can’t be interrupted?
• Observe, take notes or video
• Talk afterwards

Very long process?
• Observe different people at different phases in the life cycle

Experts are too busy?
• Use assistants
• Study similar types of work

Can’t get there?
• Bring users in with their artifacts
• Recreate their work at our site
Finding Users

Checklist for finding customers

- Direct mail
- Solicitation through the web site
- Customer registration data-base
- Sales force
  - Warning: they may take a while to respond to requests
- Advertising at local community centers
- Talking to the field test sites
- Looking for the customers you lost to competitors

Assignment 2
For each student in your group, choose one person whom you can interview for the purposes of this analysis
Describe each of these persons briefly, without giving their names

Preparation

Setting up the interview

- Explain why you want to study their work
- Tell them you want them to do their work in front of you
- Go at a time when the work you want to see is happening
- OK to ask them to save tasks you are interested in until you’re there
- Explain the interview to the people whom you will talk to as well as to their management
- Guarantee confidentiality for the individual and the company
- Send a letter describing the interview process and what you want to find out about
- Call the day before to remind them you’re coming

Assignment 3
State how you will explain the interview to ‘I, both while scheduling it and at the beginning of the interview itself
Questions About U’s Background

Example Questions

- How long have you worked at this location?
- How long have you worked in your current job role?
- What relevant background/education do you have?
- ... [Other questions that are relevant for the given system and user]

Comments

Some of these questions will not be applicable in your case, so they must be replaced with similar questions

Assignment 4

Formulate at least 5 questions that are specifically appropriate for your interview

Questions About Task Performance

Example Questions

1. When ...?
   To understand what triggers tasks
2. Where ...?
   To determine the location of tasks in the workplace
3. How ...?
   To understand steps in carrying out tasks
4. What ...?
   To understand the objects or artifacts associated with tasks
5. Why ...?
   To get at underlying goals
6. How often ...?
   To identify frequent and infrequent activities
Questions About Task Performance

Example Questions (continued)

7. How long ...?
   To get benchmark data concerning time to complete tasks
8. What do you call that?
   To discover user jargon and terminology

Comments

You will be asking questions like this spontaneously, as relevant situations occur

Assignment 5

In order to prepare for this process, for each question listed above, write a specific example of a question that it might make sense to ask

Example, for Question Type 1:

(\textit{U} has just gone through the inbox of an email system, deleting unneeded Messages)

"When do you delete messages that you no longer need?"

Questions About Errors and Problems

Example Questions

1. What \textit{errors} typically occur?
2. How do you discover and correct these errors?
3. What are the main \textit{bottlenecks} in this task?
4. What are the main \textit{problems} that you encounter?

Comments

During the interview/observation, you will be trying to answer these questions yourself by observing \textit{U}

Still, at the end, you will want to ask these questions explicitly so as to uncover problems that you haven't observed

When asking these questions at the end, you may want to give concrete examples so as to make it clear what the question means
Questions About Errors and Problems

Comments (continued)

Note: A bottleneck is a part of a task that is especially difficult to execute efficiently. Example: Getting rid of all of the junk mail that comes in, if it makes up 80% of the incoming mail and each message has to be examined and deleted individually.

Assignment 6

Write down two examples of errors, bottlenecks, or other problems that you can use as examples when asking these questions — ones which will be understandable to your

The Interview Itself

How to run the interview

• Watch them work and ask them about what they do
• Talk about the work in front of them or get stories of specific events
• Follow them around wherever they go
• Offer suggestions for what you think is motivating them or what their strategy is — listen for them to correct you
• Build a personal, trusting relationship
• Make it okay to be nosy and interrupt

General model of the relationship

• The user is the master
• The interviewer is the apprentice
• The master is in control of the observation/interval, but he allows the apprentice to probe to clarify her understanding
  In later interviews, the control can shift more to the interviewer, who by then will have more knowledge
Assignment 7

Write a paragraph that indicates what you will say at the beginning of the interview/observation in order to establish the proper relationship and to have you start working in a way that will yield useful information.

(You won’t have to read this paragraph to verbatim, but it’s important to think about what you will say – both at the beginning and at any time during the interview/observation when you think things aren’t going as well as they should be)

General Rules

Rules of thumb

• Interview 15-20 users filling different roles at four to five sites to get a good initial cross-section

• Three to five users are enough to understand a small, focused task

• Conduct multiple interviews with different people at one site to see the scope of the work

• Allow 2 hours for an interview
  Can do up to a full day of following a user around

• Run interviews with one or two designers per customer
  Second designer primarily takes notes

• Conduct two to four interviews at a time
  Then interpret results, reset focus, and go out again
Collecting Data (1)

How to bring back the data

- Write notes furiously
- Keep sample artifacts from customers
- Take pictures
- Have users help build paper prototypes
- Create task flows of work you see them do
- Get the user to help write task flows and scenarios of their work using real events
- Choose when to videotape (only when you need it to see the real details)
  - Walk through videotape with the user to ensure you understand what they did

Collecting Data (2)

Comments

The form that your notes should take is discussed in the next section

Regarding task flows and scenarios, it’s probably best just to show your notes on the observed actions (see below) and ask him/her to comment on the extent to which the sequence observed is typical

Assignment 8

Make a list summarizing which of the methods mentioned on the slide you will use to acquire information during the interview/observation
Rewarding Participants

How to say thank you

- Thank-you letter
- T-shirt/mug
- Free software
- Pay ($100/user is typical)
- Letter of recognition when the product comes out

Analyzing the Results

How to analyze what you learned

- Interviewer reviews notes and tapes, capturing key issues
- Interviewer captures issues with someone else to get another point of view
- Interviewer walks through the interview with the whole design team
  - Get a diverse team for multiple perspectives
  - Everyone identifies points to capture
- Capture issues on-line or on Post-It notes
- Build models representing how the user worked
- Analyze artifacts
- Build task flows
- Build information flows
Checking the Interpretation

Checking the interpretation

- See whether the interpretation holds for the next customers interviewed

- Have customers validate data and models after interpretation
  
  Use the model to walk them through their work

- Walk through paper prototypes in a follow-up visit with the customer or a new customer

- Share models and findings with experts in the product or system to fill in holes and clarify technical aspects you didn’t understand

Getting New Ideas

Brainstorm design ideas from the data

- Focus on the new way to work, not the technology

- Stay at a high level –don’t design the UI prematurely

- Draw pictures tell the story of the work
  
  Involve developers; involve customers

- Use the brainstorms to build storyboards and drive design

Testing prototypes

- Test with scenarios from actual users interviewed

- Test by taking them to customers

- Don’t demo –have them pretend to do their real work in the prototype

- Ask key question: Would you try using this gizmo to solve your problem?
Taking Notes

Examples of notes

(See the example material on the following three slides)

Comments

The slides give examples of the type of information you should write down and how it can be organized.

You can decide exactly how you will take notes and organize them.

Assignment 9

Prepare the computer files or sheets of paper on which you will make your notes

Put in some categories like "Trigger" so as to provide some advance organization

Submit an example file or sheet of paper as part of the assignment.

Data Collection Example

Data Collection in a Police Station

<table>
<thead>
<tr>
<th>Trigger</th>
<th>Use Case (Task)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrest</td>
<td>Fill out property forms for all property associated with an arrest (in this case a domestic assault)</td>
</tr>
</tbody>
</table>

Task Scenario Sequence

1. Respond to emergency call
2. Pick up perpetrators and take property (knife, bag of marijuana) into custody
3. Write up property summary so station commander can make entry in station log
4. Secure prisoner
5. Store property in locker
6. Fill out arrest paperwork, obtain arrest number
7. Contact district attorney
8. Dispose of prisoner (must be done within 2 hours of arrest)

Errors, Problems, Comments

- Police officer might do this type of task only four times per year
- Use Case may currently take 2 to 6 hours to complete
- High frequency of missing data, incorrect data, missing forms
- Very high frequency of interrupts and distractions during task
### Data Collection in a Police Station (2)

**Trigger**
- Property clerk interrupts with question regarding a previous property form

**Use Case (Task)**
- Make corrections to a previous property form

**Task Scenario Sequence**

1. Look up previous incident in station log by date and police officer name
2. Trace info from station log to property log
3. Get info from property log and supply it to property clerk so property form can be corrected

**Errors, Problems, Comments**
- High frequency of missing info from station log
- High frequency of missing info in property log

### Data Collection in a Police Station (3)

**Trigger**
- (Return to arrest task)

**Use Case (Task)**
- (Continue filling out property forms from arrest)

**Task Scenario Sequence**

10. Retrieve property from locker
11. Back to station commander to get property forms and property packaging
12. Fill out draft property form
13. Back to station commander to approve draft property form

**Errors, Problems, Comments**
- High frequency of missing numbers
- Property forms drafted before typed because of high level of errors and difficulty of correcting typewritten forms
Chapter 5 - The Design Process

5.4 Usability engineering, p. 199
   We will look at this topic in some depth in Class 10
   This section provides a good written introduction

Worked exercise: usability specification, p. 203

5.5 Iterative design and prototyping, p. 205
   You may find it helpful to think of how you might use ShortCutter (cf. the midterm exam) to prototype an interface iteratively

[End], p. 212

Chapter 15 - Out of the Glass Box

15.10 Virtual reality, p. 578

15.11 Information and data visualisation, p. 583
   This section complements our earlier discussions of screen design issues with reference to some more modern developments
   Think back to the Data Mountain and the Task Gallery (Class 5) as examples

15.12 Summary, p. 590
Design Project Assignment for Class 10

General instructions

This week, the instructions for the design project assignment are mixed in with the normal slides.

In the slides in the section "Contextual Analysis: Specific Hints", look for the subsections labeled "Assignment [N]"

For each such assignment, write down your answer.

Announcement of Thesis Presentation

Next Tuesday, November 14th, MICT student Tara Cordes will give her thesis presentation.

Time

13.00 exactly

Room: to be announced by email

If in doubt, come to our normal classroom shortly before 13.00

Topic: "Development of a Wearable Computer Swimming Prototype"

Comments

This work contains many examples of the activities that you are performing for your design project.

So although attendance is not required, it is highly recommended.