Lecture 4:
User and Task Analysis

February 3
Recap

UCD Three principles:
1. Early focus on users and tasks
2. Iterative design with prototypes
3. Empirical measurement on prototypes
TV for the food court

• Problem: Where should we put TV screens in the Stamp foot court?
Lecture 4:
User and Task Analysis

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Why early focus on users?

• Our guesses are often not good enough
• Users are almost always right.
• We are not users.
• User are not us.
Two Goals

1. Understand **users**, their **tasks**, and the **context** of those tasks

2. Produce a set of **requirements**
1. Users
2. Tasks
3. Context
4. Requirements
Users
There is no ideal users

• Focus on **who they are** not **what they should be**
Overview

1. Find users
2. Gather data from users
3. Characterize users
4. Identify classes of users
5. Create persona
Where can we find users early?

- Clients
- Existing customers
- Potential customers
- Friends
- Students
- Colleagues
- User representatives
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Be aware of limitations

• Sample bias
  – Friends are too nice

• Cost (money and time)
  – Recruiting subjects is expensive
Characterize users

- Age
- Gender
- Language
- Cultural convention
- Education
- Physical limitations
- Technical experiences
- Motivation
- Attitude
- Usage pattern
Example

- Age
- Gender
- Language
- Cultural convention
- Education
- Physical limitations
- Technical experiences
- Motivation
- Attitude
- Usage pattern
Identify user classes

• Simplify problems

• Instead of paying attention to many individuals, we can focus on a small number of representative user types.
Identify other stakeholders

- Stakeholders include not only primary users but also secondary users who may be affected indirectly by usability problems experienced by primary users.

Examples:
- X-ray technicians (primary) and cancer patients (secondary)
- Pilots (primary) and passengers (secondary)
Create persona

• Create a fictional representative for each user class
• Specify typical characteristics
• Assign a name
• Identify the key goal
Persona: Example: ATM

- Name:
  - Tom Yeh

- Characteristics:
  - 31 years old
  - Government employee
  - Ph.D. in CS
  - Use ATM once a week
  - Forgetful

- Goal
  - Withdrawal cash
Persona: Example: ATM

• Name:
  – Jason Garcia

• Characteristics:
  – 25 years old
  – Manager of a small local business
  – College degree
  – Use ATM every day
  – Very very busy

• Goal
  – Deposit loads of cash
Persona: Pros and Cons

• Advantages:
  – Provides a convenient handle for talking about user classes
  – Focuses on a typical user, rather than an extreme
  – Encourages sympathy

• Disadvantages:
  – May be misleading
  – May be stereotyping
Data gathering techniques

• Interview
• Focus group
• Questionnaires
• Direct observation
• Indirect observation
• Studying documentation
• Researching similar products
Example: Class presentation system

- Interview
- Focus group
- Questionnaires
- Direct observation
- Indirect observation
- Studying documentation
- Researching similar products
Example: ATM

• Interview
  – Go talk to bank tellers, customers, managers, one-on-one

• Focus groups
  – Get a small groups of bank tellers to meet together

• Questionnaires
  – Conduct surveys on site, phone, or letters

• Direct observation
  – Visit the bank to watch
Example: ATM

• Indirect observation
  – Watch surveillance videos
  – Analyze logs and diaries

• Studying documentation
  – Study employee manuals
  – Study customer FAQs

• Researching similar products
  – Study other banks’ ATM
Tasks
Task: Three components

• Goal
  – What does the user **need** to accomplish?

• Preconditions
  – What does the user must have **already done**?
  – What does the user must **already know**?

• Subtasks
  – How the task can be **decomposed**?
Needs

• Don’t focus on what users do

• Focus on why. Dig deep to reveal users’ true motivation and goals

• Express at the right level of motivation
  – Somewhere between moving a finger (too low) and living a happy life (too high)
Interpret user needs

• I need another monitor.
• I need a touch-screen.
• I need the text to be bigger.
• I need a keyboard.
• I need a website.
• I need a mobile app.
Why bus?

• Why walk to the bus stop?
• Why stop at the bus stop?
• Why wait at the bus stop?
• Why get on the bus?
• Why take the bus?
• Why go home?
• Why eat?
• Why sleep? ….
Why keyboard?

I need a keyboard.
I need to type.
I need to write a letter.
I need to send a letter.
I need to file my tax return.
I need to receive my tax return.
I need to make a down payment.
I need to buy a new car.
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Tasks: Example: ATM

List all the tasks
• Withdrawal cash
• Deposit cash and cheques
• Transfer money
• Check account balance
Task: Example: ATM

• Goal
  – Get some cash

• Preconditions
  – User must have applied for an ATM card
  – User must know the password

• Subtasks
  – The user must identify him or herself
  – The user must be authenticated
  – The user must select the account
  – The user must specify the amount
Task: Example: Email

- **Goal**
  - Send an email

- **Preconditions**
  - User must have logged in to the account
  - User must know the recipient’s address

- **Subtasks**
  - The user must enter the content of the email
  - The user must enter the recipient’s address
  - The user must indicate the email is ready to be sent
Preconditions

• Conditions that need to be satisfied
• Two types:
  – Knowledge: what must be known
  – Action: what must be done
• Errors can occur when these conditions are not satisfied. (e.g., users do not know the password)
Scenarios

• Tell a story

• What should be in the story?
  – Goal
  – Task
  – Context
  – Error
  – Emotion
  – Drama
Scenarios: Tom needs $$$

Valentine’s day is tomorrow. Tom wants to buy an artwork as a gift for his wife from a local art dealer who only takes cash. Tom needs some cash because there’s not enough cash left in the wallet. On the way to school to teach CMSC 434, he decides to stop by a local convenience store and withdraw some cash from the ATM in the store. He pulls out his wallet and takes out his ATM card. He swipes the card and is asked to enter the password. He takes out his glove from his right hand because the touch screen does not respond to glove that well. A tattooed man standing nearby seems to be looking in the direction of the ATM. Tom worries that that person may be peeking at the passwords. So he covers the screen with his body. …… Tom finally gets the cash and starts walking away. But some strange noises coming from behind …… He forgot about his card.
Context
• Environment
  – outdoor, indoor, loud places

• Social context
  – Who else is around? What social etiquette is expected? (e.g., cellphone use in theaters)

• Relationships and communication patterns
  – Can users talk to each other? Ask each other for help? Ask someone for help?
Requirements
Requirements

- What should the users be able to do?
- How should the users do it?
Categories of requirements

• Functional
• Data
• Environment
  – Physical
  – Social
  – Organizational
  – Technical
• User characteristics
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• Functional
• Data
• Environment
  – Physical
  – Social
  – Organizational
  – Technical
• User characteristics
Example: Requirements: ATM

- Functional
  - Must allow users to get cash
- Data
  - Must enable users to check balance information
- Environment
  - Physical
    - Must allow users in noisy outdoor environment
  - Social
    - Must not allow users standing in the back to see private information
  - Organizational
    - Must enable users to get in touch with tech support
  - Technical
    - Must be able to communicate to the central server via phone lines

- User characteristics
  - Must help forgetful users remembering taking cards away
Activity: Stamp Union

Problem: Stamp Union is too far

1. Questionnaire
2. Focus group
3. Analysis
Questionnaire

1. How many times do you go to the Stamp in a typical week? (0, 1, 2 or more)

2. What is the distance you have to walk in a typical trip to the Stamp? (5, 10, 15 minutes, or more)

More...
Focus group

• Four focus groups
  – Pick a facilitator and a note taker

• Questions to focus on:
  – Possible destinations:
    • Where does each member go?
  – Most frequent destinations:
    • Where does each person go the most frequently?
  – Reason:
    • Why does each person go?
Analysis

• Two by two
• Identify at least two distinct user classes among the students in your own focus group
• Identify 1 major task in each group
• Describe the task by
  – Goal
  – Preconditions
  – Subtasks