CSE440: Introduction to HCI

Methods for Design, Prototyping and Evaluating User Interaction

Lecture 08: Task Analysis

Nigini Oliveira
Manaswi Saha
Liang He
Jian Li Zheng
Jeremy Viny
Team contract
Team Responsibilities

Many of us have legitimate reasons to be away or be late
  Be sure to communicate the reasons to us
  Participation is an element of your grade (10%)

But your real commitment is to your team
  Be sure you communicate your "aways" to your team
  Be sure you manage your commitments
  Let us know if there are issues
Groups vs. Teams

Teams produce both *individual contributions and collective work-products*

Teams establish a social contract that relates to their purpose and guides and obligates how they must work together

“We hold ourselves accountable” is a strict requirement, whether or not a “boss” exists
Groups vs. Teams

Teams differ fundamentally from working groups:
- teams require both individual and mutual accountability
- teams rely on more than group discussion, debate, and decision
- … on more than sharing information and best practice performance standards
- teams produce discrete work-products through the joint contributions of their members
- this is what makes possible performance levels greater than the sum of all the individual bests of team members.

A team is more than the sum of its parts.
Ways to Team Success

Common commitment
   requires a purpose in which team members believe
Specific performance goals
   comes directly from the common purpose
   helps maintain focus, starts with something achievable
A right mix of skills
   technical/functional expertise (e.g., writing/visual/coding)
   problem-solving & decision-making skills
   interpersonal skills
Agreement and mutual accountability
   who will do particular jobs, when to meet & work, schedules
Team development

Forming stage
  Team tend to communicate in indirect polite ways

Storming stage
  characterized by conflict
  can be productive, but consumes time and energy

Norming stage
  formulate roles and standards
  increases trust and communication

Performing stage
  you actually achieve your goals
  highly task oriented
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Team Contracts

Establishes individual accountability
- Individuals are usually motivated to maximize their own rewards and minimize their own costs (individualistic motives)
- Even if only one person minimizes their effort, others may reduce their efforts too
- May result in a dysfunctional team and poor quality of work

A team contract avoids such obstacles — at least when done well.
Team Contracts

Establish procedures and roles

Can help jump-start a group’s collaborative efforts by focusing team members on a definite task

Ensure everyone agrees on the quality of work they all wish to achieve (“we all want an A” or “we all want a WOW project”)
Develop a Team Contract (15 minutes)

**In your group** discuss the first three weeks of your team work
   What did you like about it?
   What should you as a team improve in the future?

Use these talking points to fill out your team contract
   (Find team contract examples [here!](#))

Submit a copy of it (as a PDF) via Canvas (one contract per group)
Task Analysis
Task Analysis

Focus on how do people accomplish a specific tasks

Helps identify the tasks that your solution must support

Helps to find effective ways of accomplishing a task
Task Analysis

Use in combination with other user research methods

Task Analysis is a lens on the information you obtain through other user research methods

Your assignments order the two, but in practice you should iteratively decide how to best draw upon all relevant methods throughout a process
Task Analysis Questions

Who is going to use the system?
What tasks do they now perform?
What tasks are desired?
How are the tasks learned?
Where are the tasks performed?
What is the relationship between people & data?
What other tools do people have?
How do people communicate with each other?
How often are the tasks performed?
What are the time constraints on the tasks?
What happens when things go wrong?
Question 1

Who is going to use the system?

Identity
   In-house or specific customer is more defined
   Broad products need several typical consumers

Background

Skills

Work habits and preferences

Physical characteristics and abilities
Task Analysis of a parking meter
Task Analysis of a parking meter

Who is going to use the system?
Task Analysis of a parking meter
Question 2 and 3

What tasks do they now perform?  
What tasks are desired?

Important for both automation and new functionality  
Relative importance of tasks?  
Observe people, see it from their perspective

Automated Billing Example
  small dentists office had billing automated
  assistants were unhappy with new system
  old forms contained hand-written margin notes
  e.g., patient’s insurance takes longer than most
POPOVERS

2 cupfuls flour
2 eggs
1/2 teaspoonful salt
2 cupfuls milk
2 teaspoonfuls melted fat

Beat eggs slightly. Sift flour and salt, and add alternately with milk to eggs. Add melted fat. Beat with egg beater until smooth and full of bubbles. Fill hot greased cast aluminum or iron griddles or glass or earthenware custard cups, 2/3 full of popover batter. Place immediately in a hot oven of 450° F. and bake for 30 min. Then lower temperature to 350° F. and bake for 15 min. longer. Makes 9 popovers.

CORNBREAD

2 cupfuls cornmeal
1 teaspoonful soda
1 1/2 teaspoonfuls salt
2 cupfuls sour milk
2 eggs, beaten
2 tablespoonfuls melted fat
3 tablespoonfuls sugar

Sift dry ingredients together. Mix milk with beaten eggs and add to dry ingredients. Stir well together and add melted fat. Pour into a hot greased baking pan or muffin tins and bake in hot oven of 400° F. for 20-25 min. Makes 24 pieces.
Question 4

How are the tasks learned?

What does a person need to know to perform the task?

Do they need training?
  academic
  general knowledge / skills
  special instruction / training
Question 5

Where are the tasks performed?

Office, laboratory, point of sale?
Effects of environment on customers?
Are people under stress?
Confidentiality required?
Do they have wet, dirty, or slippery hands?
Soft drinks?
Lighting?
Noise?
Question 6

What is the relationship between people & data?

Personal data
   Always accessed at same machine?  
   Do people move between machines?

Common data
   Used concurrently?  
   Passed sequentially between customers?  
   Remote access required?  
   Access to data restricted?  
   Does this relationship change over time?
Question 7

What other tools does a person have?

More than just compatibility
How customer works with collection of tools

Automating lab data collection example:
  how is data collected now?
  by what instruments and manual procedures?
  how is the information analyzed?
  are the results transcribed for records or publication?
  what media/forms are used and how are they handled?
Question 8

How do people communicate with each other?

Who communicates with whom?
About what?
Follow lines of the organization? Against it?
Question 9

How often are the tasks performed?

Frequent use likely remember more details
Infrequent use may need more help
   Even for simple operations,
   Make these tasks possible to accomplish

Which function is performed
   Most frequently?
   By which people?
   Optimizing for these will improve perception of performance
Question 10

What are the time constraints on the tasks?

What functions will people be in a hurry for?

Which can wait?

Is there a timing relationship between tasks?
   (Like the Target marketing for pregnancy case...)
Question 11

What happens when things go wrong?

How do people deal with
  task-related errors?
  practical difficulties?
  catastrophes?

Is there a backup strategy?
What are the consequences?
Selecting Tasks

Real tasks people have faced or requested
  collect any necessary materials

Should provide reasonable coverage
  compare check list of functions to tasks

Mixture of simple and complex tasks
  easy tasks (common or introductory)
  moderate tasks
  difficult tasks (infrequent or for power use)
What should tasks look like?

Say what **person** wants to do, but not how
allows comparing different design alternatives

Be specific, **stories** based in concrete facts
say who person is
design can really differ depending on who
give names (allows referring back with more info later)
characteristics of person (e.g., job, expertise)
story forces us to fill in description with relevant details

Sometimes describe a complete “**accomplishment**”
forces us to consider how features work together
Using tasks in design

Write up a description of tasks
formally or informally
run by people and rest of the design team
get more information where needed

Manny is in the city at a restaurant and would like to call his friend Sherry to see when she will be arriving. She called from a friend’s house while he was in the bus tunnel, so he missed her call. He would like to check his missed calls and find the number to call her back.
Types of Task Analysis

Hierarchical Task Analysis
focused on decomposing a high-level task into subtasks

Cognitive Task Analysis
focused on understanding tasks that require:
  - decision-making
  - problem-solving
  - memory
  - attention
  - and judgement

https://www.interaction-design.org/literature/article/task-analysis-a-ux-designer-s-best-friend
Task: Park in a new neighborhood

Peter is going to brunch on a Sunday with his roommates. He is trying a new place he found on Yelp. He has the address for the place and he is using a smartphone GPS for directions. He leaves the apartment with his roommates at around 8:30am and he wants to beat the crowd so they won’t have to wait in line. He is driving a Toyota Corolla that he has owned for five years. It is a rainy day and he doesn’t have an umbrella.
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Hierarchical Task Analysis:
Park in a new neighborhood

Steps of the task execution (detailed in a hierarchy)

- park in new neighborhood
  - determine destination
  - drive to destination
  - locate parking spot
  - secure parking spot
  - park
    - enter address in GPS
    - follow directions
    - arrive at destination
    - ...

Using Tasks in Design

Rough out an interface design
   discard features that do not support your tasks
   or add a real task that exercises that feature
   major elements and functions, not too detailed
   hand sketched

Produce scenarios for each task
   what person does and what they see
   step-by-step performance of task
   illustrate using storyboards
Task Analysis with your group

In your team:

- remind yourself which tasks you observed when doing your user research with your first participant
- select a main task that you wish to support within the scope of your project
- perform a task analysis (use the questions on the worksheets to guide your analysis)
- mark where you need more information (i.e., where your user research will be particularly useful)
Ask me something!