

CMPT 363: User Interface Design

Summer 2021

Week 5: Gathering Requirements, Task-Centered Design

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Recap from Last Lecture

- Usability Testing (cont'd)
 - Ranking severity, what to do with the results
- User-centered Design
 - Useful in every steps of the design process
- Sketching & Prototyping
 - Levels of fidelity
 - Wizard of Oz
 - Horizontal, vertical, and variations of prototypes

Question!

- **Poll** – Which of the following is the Wizard of Oz method not suitable for?
 - A-measure the performance of a close-to-finish product
 - B-evaluate people's respond to the paper prototype of an interactive system
 - C-demonstrate a device that has some components still under development
 - D-gather general requirements on a future product
- **Extended thinking exercise:** For cases when WvZ is not suitable for, what would you do instead to test?

Group Project Part I

- Overview
 - To design the interface for **an online calendar** made specifically for **university students** to **facilitate different kinds of activities**
- Part I (due on 18 June, 11:59p, only one person each team needs to submit)
 - Heuristic Evaluation on existing application(s)
 - Context & User identification, Design requirements gathering
 - Sketch per functional requirement
- **Make sure you have already scheduled regular meeting times and workloads!**

Today

- Identifying Contexts & Users
- Task-Centered Design
- Gathering Requirements

- Group Project Part I available on Canvas, due on 12 Feb, ask questions at Canvas Discussion
- You should have formed your group of 5 by now – **when you form a team, assign yourselves into one of the project teams in Canvas!** (if you haven't, I'll assume you don't have a team and will assign you to one by next lecture)
 - Use Canvas Collaborations to assign yourselves into teams (<https://community.canvaslms.com/docs/DOC-10516-421264913>)
 - Set a regular meeting time (at least once per week), know any time conflicts
 - Decide on a collaboration platform (e.g., Google Docs, Microsoft Teams, Dropbox, ...etc)
 - Agree on and sign the Team Contract

Designing a Traffic Button

- Expensive, likely to break down after several years
- Want to come up with a design with no moving parts that lasts longer and cheaper to make
- 5 Min Activity – Things to consider?



Older versions of Novax's APS buttons

Designing a Traffic Button (cont'd)

- A vibrating piezoelectric button
 - Sensors detecting pressure or mechanical stress (no moving parts)
 - Visual cue for directionality
 - Haptic and audio feedback



DESCRIBE A TREE SWING

Everyone has their
own interpretation

Need a way to
figure out what
users need

How do we do that?



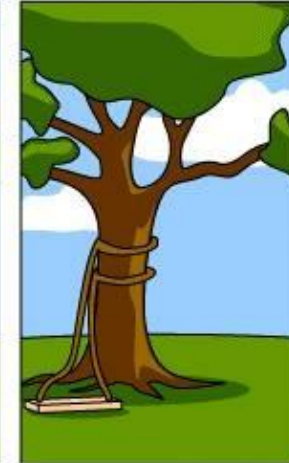
How the customer explained it



How the Project Leader understood it



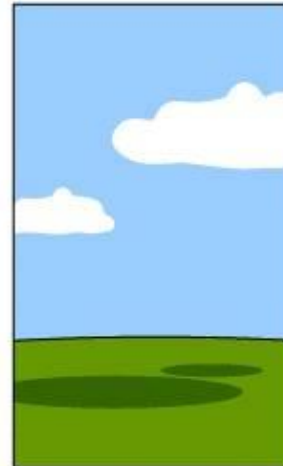
How the Analyst designed it



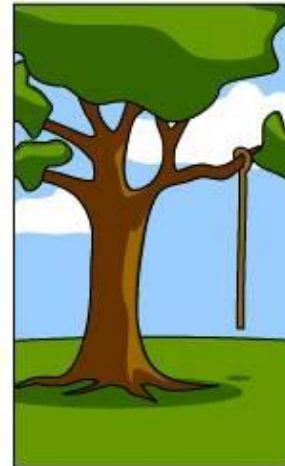
How the Programmer wrote it



How the Business Consultant described it



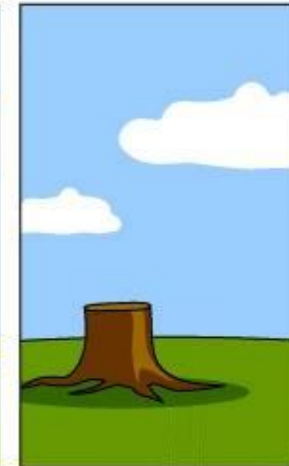
How the project was documented



What operations installed



How the customer was billed



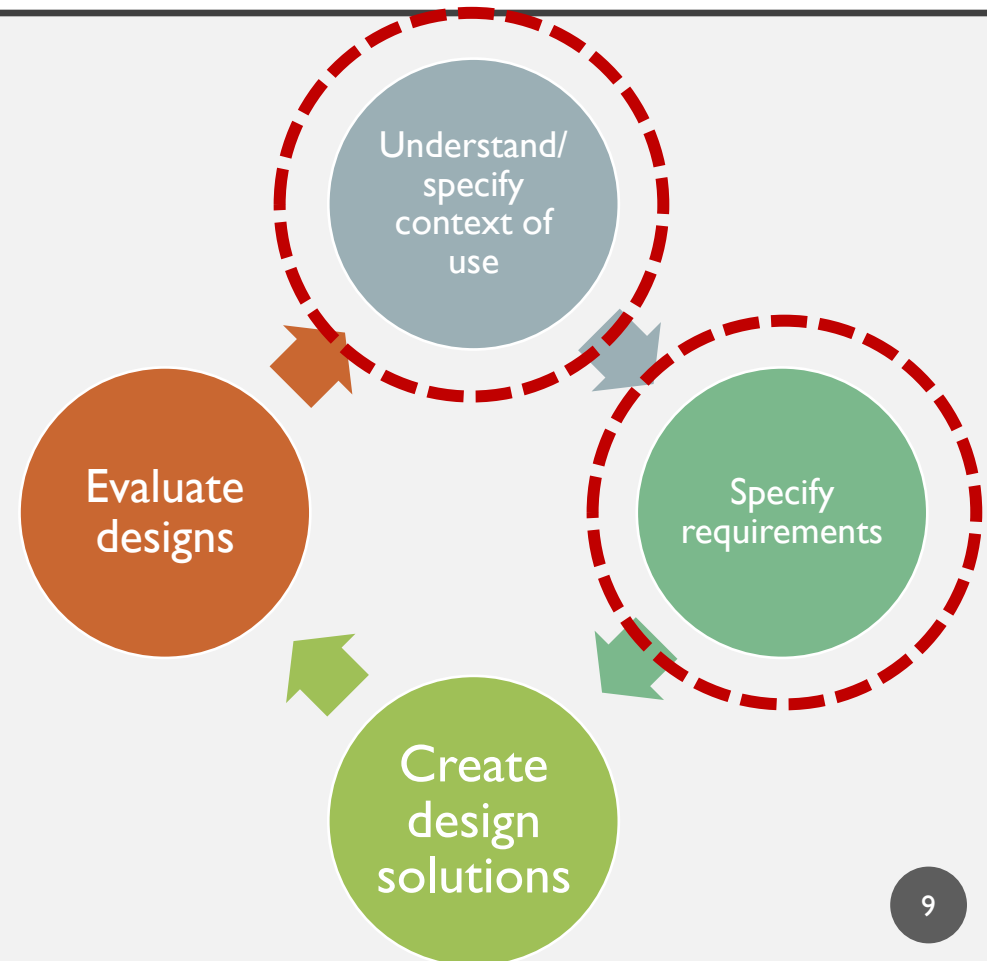
How it was supported



What the customer really needed

Involving Users in Every Step

- Understand/specify context of use
 - Interview users & examine tasks
- Specify requirements
 - Verify & prioritize with users
- Create design solutions
 - Design with users (co-design)
- Evaluate designs
 - Invite users to assess



Identifying Contexts & Users

So we can understand & specify context of use

Contexts & Users

- Contexts – the situation or environment that influence decisions
 - **When/where:** time and location at which tasks are carried out
 - **Who:** people with whom decision making is involved
 - **What:** considerations and information needed to make decisions
 - **How:** steps taken to get things done
- Users – the people who carry out tasks and make decisions
 - **Demographics** (e.g., gender, age group, education background, capability)
 - **Hopes & fears** (e.g., stressed, don't want to make mistakes)



Why Are Contexts Important?

- **When/where**: time of day, geographic location, physical location
- **Who**: roles, who needs to be notified, who is affected
- **What**: regulations, policies, dependency on other resources
- **How**: protocols, standards, norms, challenges
- Together these information impose **constraints** and **implications** to the design for it to adhere to
 - Use of language
 - Priorities of usability goal
 - ...etc

Why Are Demographics Important?

- Demographics describe the type of the users, provide **insights** into their approach or attitude towards an interface
 - **Characteristics**: education background, capability, attitude towards computers, ...etc.
 - Leads to complexity and accessibility of interface (e.g., use of words, colour, modalities, UI layout)
 - **System use**: novice/expert/casual/frequent
 - Novice users need step-by-step prompts, more constraints, and clear information; expert needs less, and likely to appreciate advanced control and shortcuts
 - Casual users need more reminders, recognition over recall
 - Frequent users benefit from shortcuts, automation



Why Are Hopes & Fears Important?

- Hopes & Fears describe the mental/emotional state the user is in, thus affecting their **judgements**
 - High stress level requires more fail-safe mechanisms, even a “calmer-looking” interface
 - Fear of making mistakes benefit from an assuring interface with lots of feedback and error handling
 - Uneasiness towards computers requires more reassurance, even a “non-computer” look and feel
 - Relaxed moods are more open to suggestions
 - ...etc.



Where & What of Users

- Ideally through **direct contact** (e.g., same company, company being consulted)
 - If not accessible, through an **intermediary** (e.g., representative, guardian, care-giver)
 - If neither works, **research and define** expected users and tasks (make sure you verify with clients and update if needed)
- Broad coverage of possible users
 - Typical “**expected**” users (e.g., regular student for Canvas)
 - **Occasional but important** users (e.g., exchange student/evaluator for Canvas)
 - The “**unusual/extreme**” users (e.g., students who overload their course work, who need special accommodations)

5 Min Activity + 5 Min Break

- What would a mobile interface for an language learning app look like for (1) children, and (2) adults?
 - What would you show first? What kind of instructions will you provide? In what form?

Learn Some Languages for Children

Learn Some Languages for Adults

How to Describe A Context?

- Typically through a **scenario** in describing the activities in a story that allows exploration and discussion of contexts, needs, and requirements (ID-Book p408). Can be used to:
 - Explain user's goals in a natural way for readers to relate easily
 - Provide a fuller picture of the activities, including historical events (that impacts decisions)
 - Talk about frustrations, thus lead to potential solutions
 - Describe an imaginary situation for future designs (futurist scenarios)

Every university student needs to send emails at some point in their student life, to their peers, advisors, instructors, ...etc. There are different reasons to send an email, for example, to schedule a meeting, to send in a form, and to ask questions. There are etiquettes they should adhere to. They typically want to do it fast and hope the recipients will get the email and respond in a timely manner. They do it anytime of the day with their phone, tablets, and computers.

How to Describe a User?

- Typically through a **persona** in describing a typical user of the design (ID-Book p403) that are:
 - Realistic but not idealized, typically a synthesized version of a number of real users
 - Characterized by a unique set of goals relating to the design
 - Enriched by details such as behaviour, attitudes, activities, and environment

Ron Smith is a 20-year-old third year university student in Computer Science major. He enjoys sports and video games. He wants a balanced study & play life, and be social. To connect with others he typically call them up or hang out with them.

Hermione Doe is a 18-year-old university student in Chemical Engineering major. She is an achiever and is very serious about her studies and wants to spend most of her time doing school work. Socializing is good but not her first priority. She uses emails and texts heavily for communications.

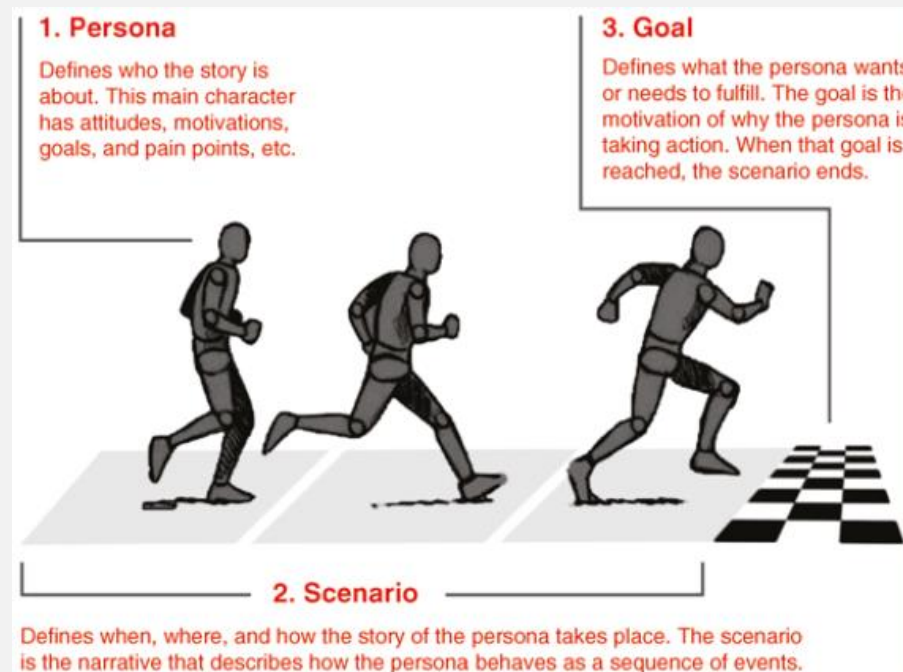
Tips on Creating Good Personas

- Capture user characteristics and synthesize
 - Not real people, not idealized
- Bring them to life with bits of a real person
 - Name, nickname, physical attributes
 - Personal background, hobbies, goals
- Can include stock photos of profile pic and belongings
 - There are online tools to generate them (e.g., <https://www.hubspot.com/make-my-persona>)
- Develop multiple personas
 - Cover spectrum of possible users



Relationship between Scenario & Personas

- A scenario describes one use of a product (or design) or one example of achieving a goal, while a persona characterizes a typical user of the product (or design) (ID-Book p414)



Task-Centered Design

Another side of the coin

Tasks

- **Activities** that need to be accomplished (by a user)
 - Typically in a **hierarchical structure** consisting of tasks and sub-tasks
 - For example, task: send an email → sub-tasks: specify recipient, write subject, write message, add attachments (optional), send content
- Described by
 - Who is doing it
 - Frequency & importance
 - Prerequisites & consequences



<https://xkcd.com/1425/>

What Can We Learn about Tasks?

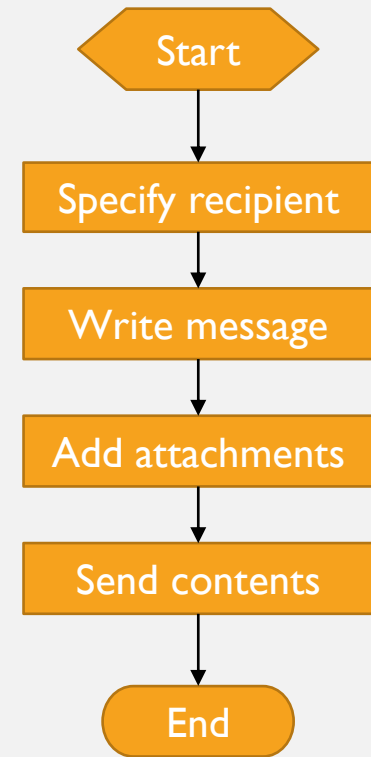
- Current tasks with existing the interface/system
 - How are things being done
 - Challenges & work-arounds
- “Wishlist” tasks
 - Tasks that users want to complete but can’t with the existing interface/system
- “Envisioned” tasks
 - Tasks that can be done with a new interface/system

Hierarchical Task Analysis

- Involves **breaking a task down** into sub-tasks, then sub-sub-tasks and so on
 - First start with the high-level task (typically a verb-noun phrase)
 - Then sub-divide into lower-level sub-tasks (typically a step to accomplish the parent task)
- Focuses on **physical & observable actions**, including those that are not directly related to software or interaction device (e.g., “write message” doesn’t specify which software to use or what kind of input)

Describing A Task – Example

- Overall task: Send an email
- User: Student
- Pre-requisite: Student already logged in the email client, internet connection stable
 - Sub-task 1 – Specify recipient
 - Sub-task 2 – Write subject
 - Sub-task 3 – Write message
 - Sub-task 4 – Add attachments
 - Sub-task 5 – Send content
- Consequence: Email being sent to recipient, a copy automatically added to “sent” folder



Describing A Task – Example (cont'd)

- Because of the way sub-tasks are listed, we can have variations of the overall task
 - Example 1 (typical): 1-2-3-4-5
 - Example 2 (no-attachment): 1-2-3-5
 - Example 3 (multiple-attachments): 1-2-3-4-4-4-5
 - Example 4 (missing recipient, error): 2-3-4-5
 - ...etc
- A good task description should describe a complete activity

Tasks Collection

- Who is doing it ✕ Frequency & importance



Instructor

- Routine & important tasks
- Routine but unimportant tasks
- Infrequent but important tasks
- Infrequent & unimportant tasks

Scope narrowed down to instructors
Instructor: routine & important tasks
Instructor: infrequent but important tasks



Students

- Routine & important tasks
- Routine but unimportant tasks
- Infrequent but important tasks
- Infrequent & unimportant tasks

Scope narrowed down to students
Students: routine & important tasks
Students: infrequent but important tasks

Evaluating Tasks

- Make sure the tasks are **actionable**, **realistic**, and **complete**
- Circulate descriptions to users, rewrite if needed
 - Pay attention to omissions pointed out, corrections, clarifications, suggestions
 - Users are not always right or accurate
 - They might not be able to anticipate new technologies
 - They might have their own bias or habits
 - Task analysis should help to tease out the actual need to accomplish the activities

Summary

- Identifying Contexts & Users
 - contexts describe the situation or environment that influence decisions, thus impose **constraints** and **implications** to the design for it to adhere to
 - users describe the people who carry out tasks and make decisions, thus provide **insights** into their approach or attitude towards an interface and what affects their judgments
- Task-Centered Design
 - tasks describe activities that need to be accomplished, thus provide **information** on how things are currently done and what can be improved or incorporated

Post-Lecture Activity

- Read/watch these (and those in the slides)
 - Chapters 11 of ID-Book: Discovering Requirements
 - Chapter 5 of the UX book: Extracting Interaction Design Requirements
https://sfu-primo.hosted.exlibrisgroup.com/permalink/f/15tu09f/01SFUL_ALMA51189030600003611
 - A Closer Look at Personas
<http://www.smashingmagazine.com/2014/08/06/a-closer-look-at-personas-part-1/>
 - How to do a research interview
https://www.youtube.com/watch?v=9t-_hYjAKww

In-Class Activity

- Take a 5min Break, then come back
- You are commissioned to design a new alarm clock
 - What do you need to design it?
 - How do you test it?

