CMPT 363: User Interface Design
Summer 2021

Week 5: Gathering Requirements, Task-Centered Design

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Recap from Last Lecture

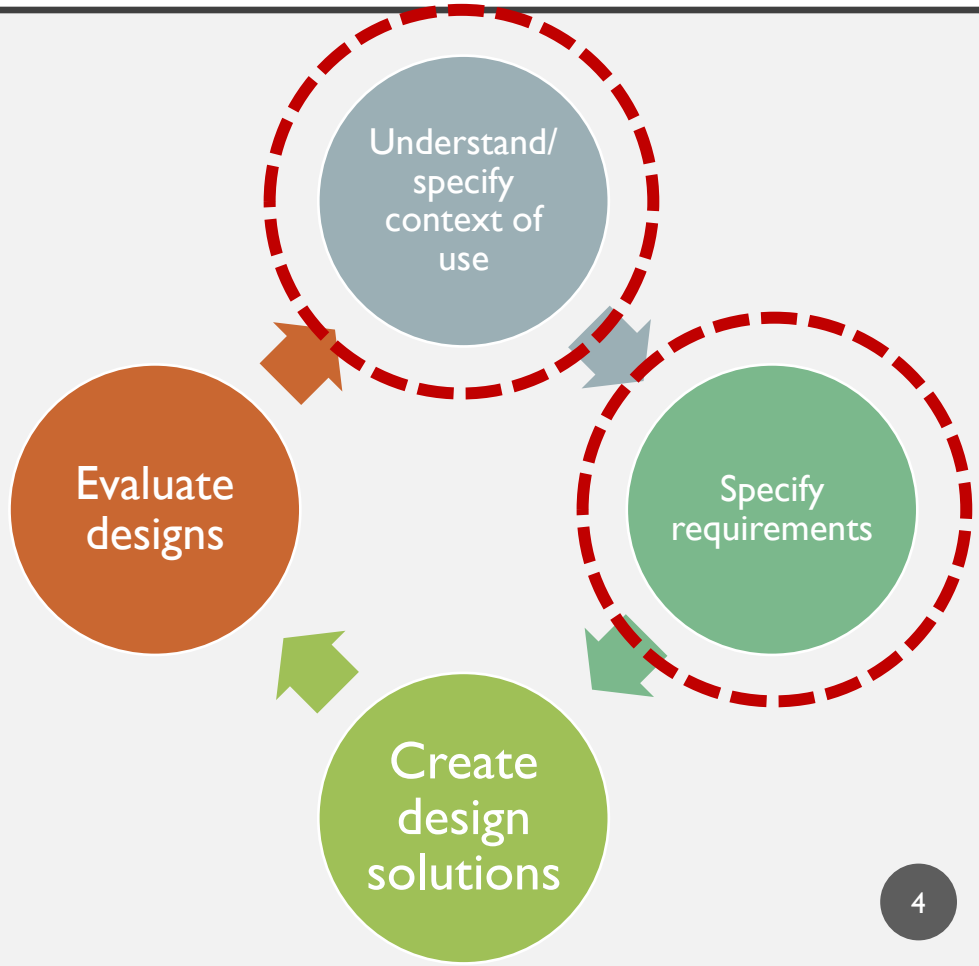
- Identifying Contexts & Users
  - contexts describe the situation or environment that influence decisions, thus impose constraints and implications to the design for it to adhere to
  - users describe the people who carry out tasks and make decisions, thus provide insights into their approach or attitude 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

Gathering Requirements

What? How? Why?

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



Requirements Help Explain the Problem Space

- Target users and their capabilities
  - Who they are, what can they do (discussed in last lecture)
- Tasks, goals, and context
  - Factors that influence decisions (discussed earlier in last lecture)
- Ways the design supports tasks
  - Necessary components of the design
- Constraints on the design's functionality & performance
  - Metrics for the design

What Are Requirements?

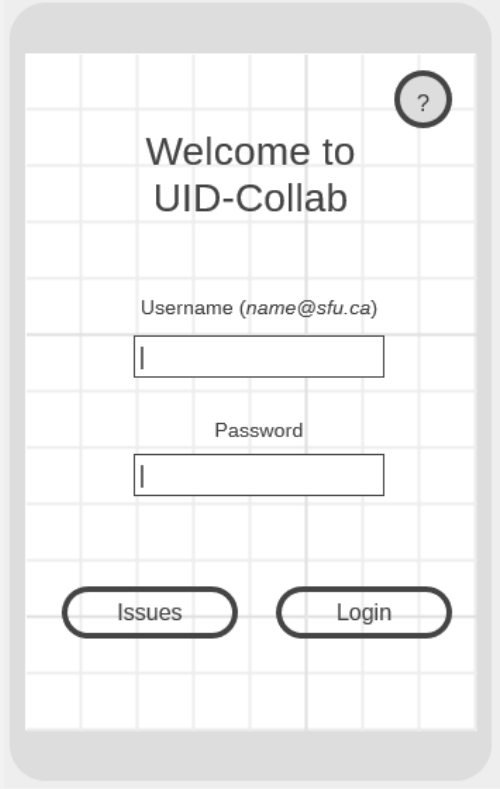
- A requirement is a **statement** about an intended product that specifies what it is expected to do or how it will perform (ID-Book p337)
  - Example 1: the time to load a map in a smartwatch GPS app needs to be less than half a second
  - Example 2: teenagers should find the design of the smartwatch appealing
- A requirement can be used to generate metrics in checking if it is being fulfilled in evaluation
  - Example 1: how much time does it take to load a map?
  - Example 2: how appealing (e.g., in a scale of 10) do the interviewed teenagers find the smartwatch?

Two Kinds of Requirements

- Functional requirements – what the design/product will do (can typically be expressed as functions, tasks, or behaviours)
  - Example 1: The interface lets the user create a username and a password
  - Example 2: The system allows adding users to the current video-conference call
- Non-functional requirements – the characteristics (sometimes called constraints) of the design, product, or system
  - Example: 1: A username has to be unique, and password should have at least a number, an uppercase letter, and a lower case letter
  - Example 2: A video-conference session should allow up to 10 simultaneous users

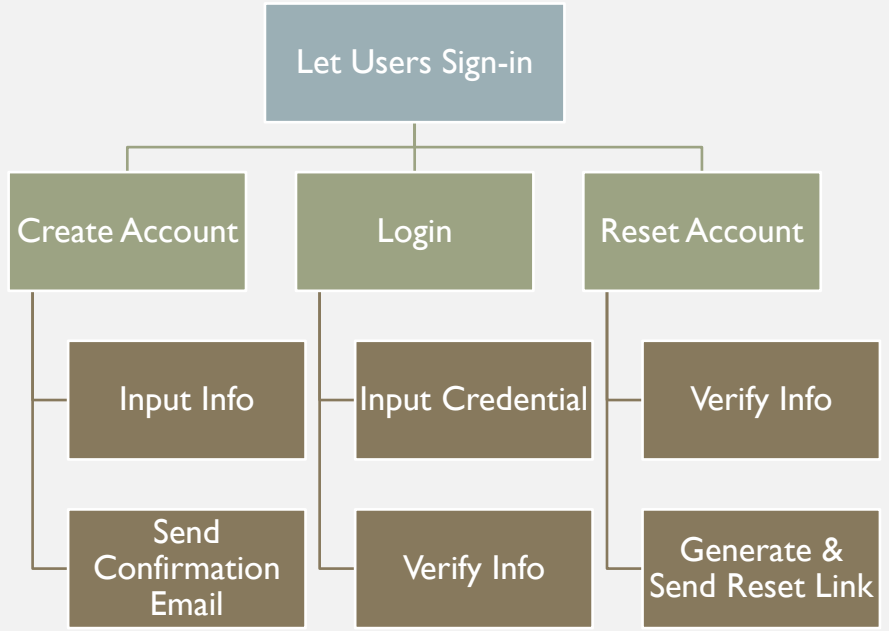
Illustrative Example with A Login Interface

- Functional requirements
  - Users can log in using their username and password
  - Users can create a new account
  - Users can retrieve their account if they forget
- Non-functional requirements
  - Log in should take less than 5 seconds
  - Error (e.g., invalid credentials) should be communicated clearly
  - Unsuccessful log in attempts for 5 times should lock the interface for 5 minutes



Functional Decomposition

- Functions can be broken down into sub-functions
  - Start from a high-level action
  - Break done into cases
  - Further break down in to steps
- Another way to view it is task the user needs to do
  - Very similar to hierarchal task analysis



Ways to Gather Requirements

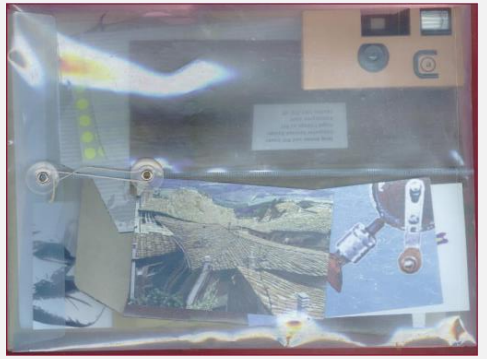
- Typical interview
  - Meet with users & ask questions
- Probes
  - Prompt users into action by interacting with a provided artifact (a probe)
- Contextual Inquiry
  - 1-to-1 on-site interview marked by the master-apprenticeship model (the user "teaches" you how to carry out their tasks)
- Brainstorming
  - A generic way to generate ideas

Typical Interview

- Direct interaction with users and ask them questions related to their work
  - Best if can meet with them at their working, otherwise find a quiet and comfortable place
- Use a semi-structured interview
  - a mix of close- and open-ended questions
  - Based on earlier answers ask for elaboration
- Record as much as you can
  - Notes, video, voice, computer-log, questionnaire…etc.

Probes (ID-Book Ch 11.4.1)

- Idea came from a project investigating novel interaction techniques to increase presence of elderly people in their local community
  - Avoid traditional approaches such as questionnaires & interviews
- Each participant was given a wallet of 8-10 postcards, ~7 maps, a disposable camera, a photo album, and a media diary
  - Each item had some associated tasks and questions on participant's perception and usage
- Collected probes were used to produce design scenarios



- Reading: Design: Cultural Probes
  https://dl.acm.org/doi/10.1145/291224.291235

Contextual Inquiry (ID-Book Ch 11.4.2)

- Originally developed in the 1990s by Holtzblatt & Jones as a process to explicitly define how to gather, interpret, and model data about how people live in order to drive design ideation
  - Can also be used to establish requirements
- Key characteristic of CI is to have 1-on-1 on-site interview to identify the context as much as possible
  - Context – go to where the user is and see what they do as they do it
  - Partnership – interviewer and user work together, instead of a regular interview
  - Interpretation – turn observation into interpretation and verify with user
  - Focus – user focuses on sharing what and how, interviewer focuses on what is relevant to the design

- Read: Contextual Inquiry, Contextual Design
  https://www.usabilitest.com/usabilitynet/tools-contextualinquiry
  https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/contextual-design

Brainstorming (ID-Book Ch 11.4.3)

- A generic technique used to generate, refine, and develop ideas
  - Can also be used in generating requirements, as well as alternative designs
  - Benefits from multiple sources (brainstorming sessions typically include multiple people)
- Tips of a successful brainstorming session
  - Include participants from a wide range of disciplines with a broad range of experience
  - Don't ban silly stuff
  - Use catalysts for further inspiration (e.g., build on top of an idea, jump back to an earlier idea, use random words)
  - Keep records
  - Make it fun (e.g., warm-up exercises, ice-breakers, causal environment)

Summary

- Identifying Contexts & Users
  - Importance and how to describe them
- Task-Centered Design
  - What are tasks and how to describe them
- Gathering Requirements
  - What are requirements and how to capture them

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

- Exercise : Think about how physical characteristics of users will affect the interface design: hand sizes, motor abilities, height, strength, disabilities