Users, Needs, and Tasks

User Experience Design

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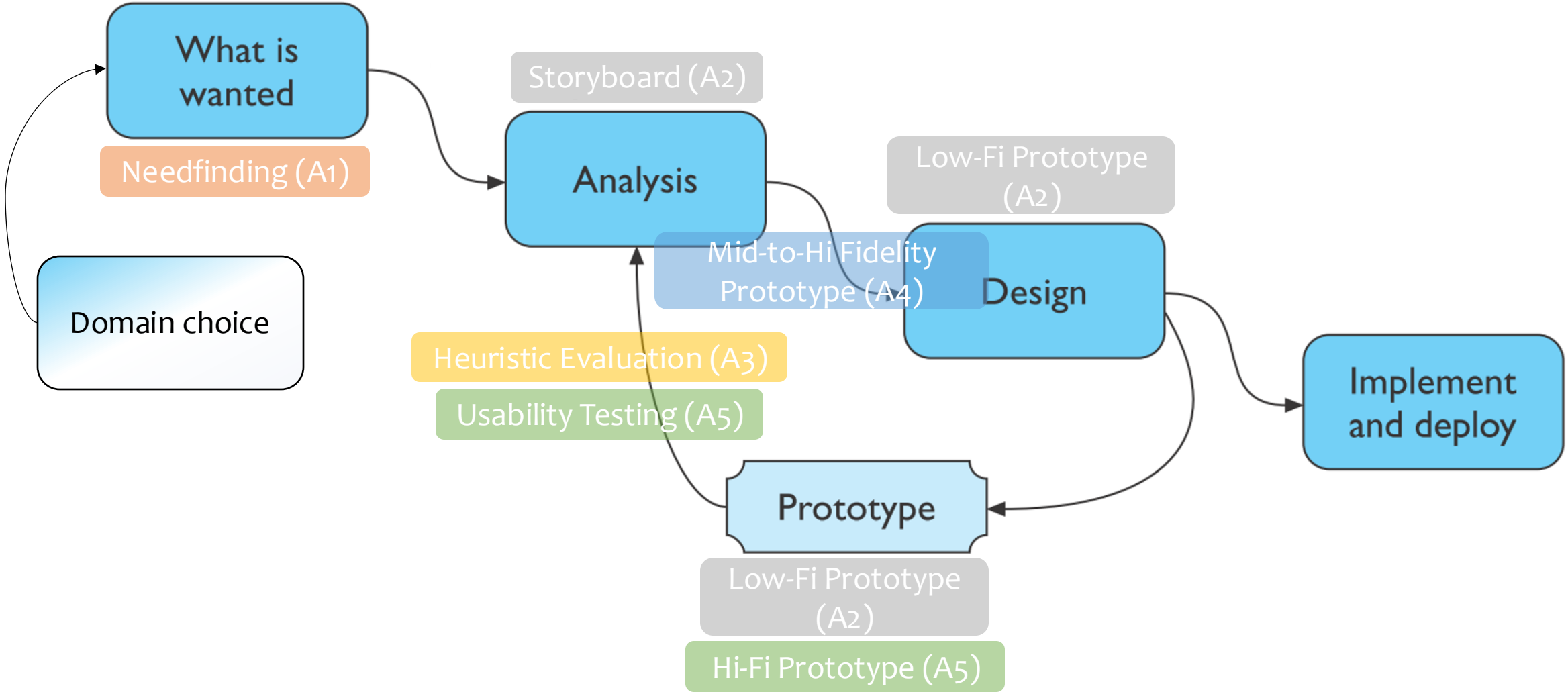
Academic Year 2024/2025

Hall of Fame or Shame?

Hall of Fame or Shame?

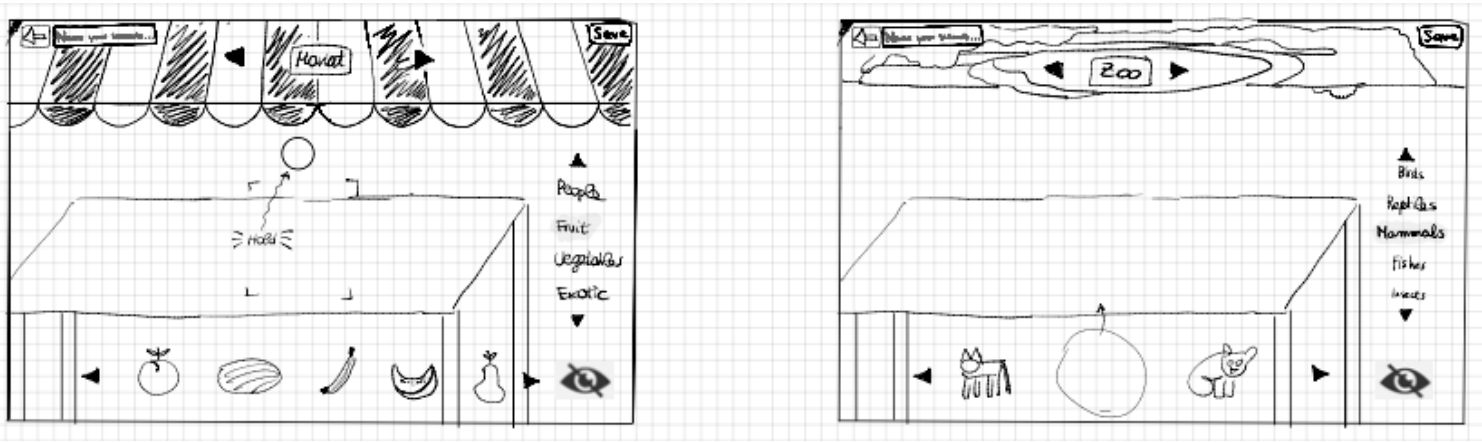
https://www.youtube.com/watch?v=e2R0NSKtVA0

Human-Centered Process vs. Assignments



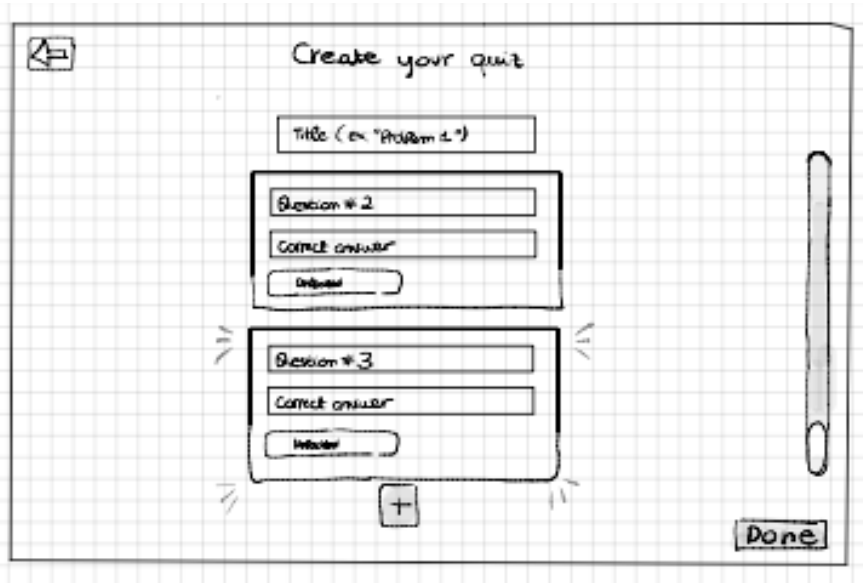
Example (2022) – Theme: ‘AR/VR for Education’

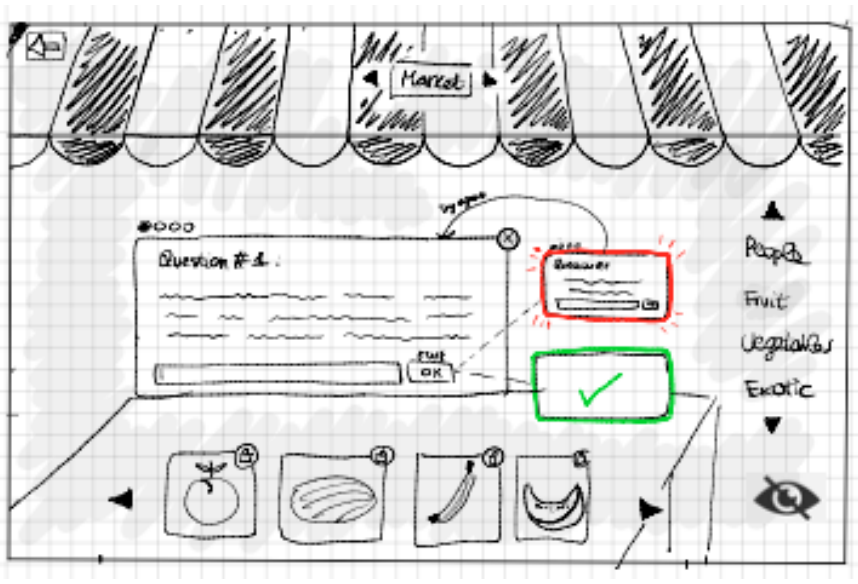
- Chosen domain: supporting elementary school teachers teaching math
- Picked solution (at the end of Assignment 1): “Allow teachers to create more engaging and better explaining scenarios to represent the [math] problem and the logic behind.”
- Excerpt from the 1st low-fi prototype:



Example (2022) – Theme: ‘AR/VR for Education’

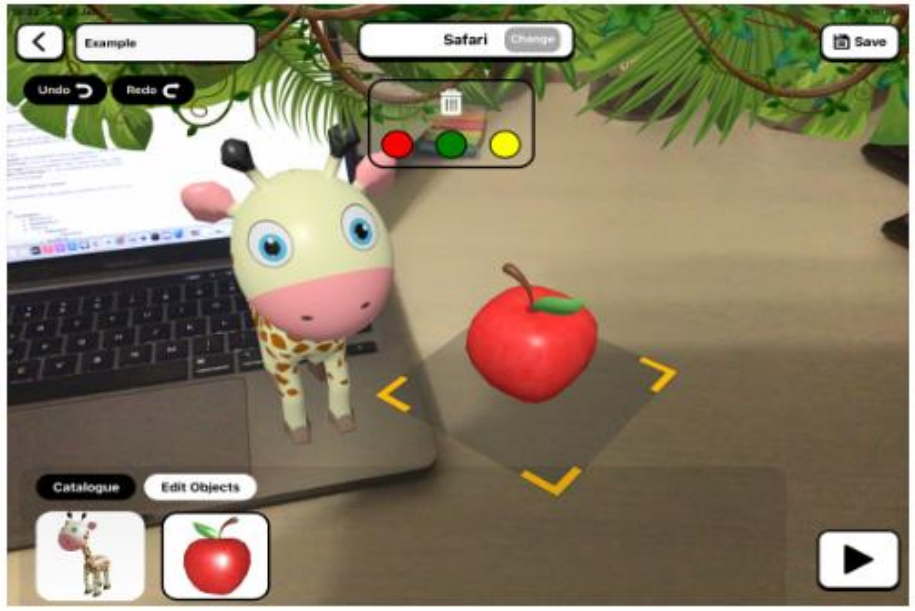
- Excerpt from the 2nd low-fi prototype:





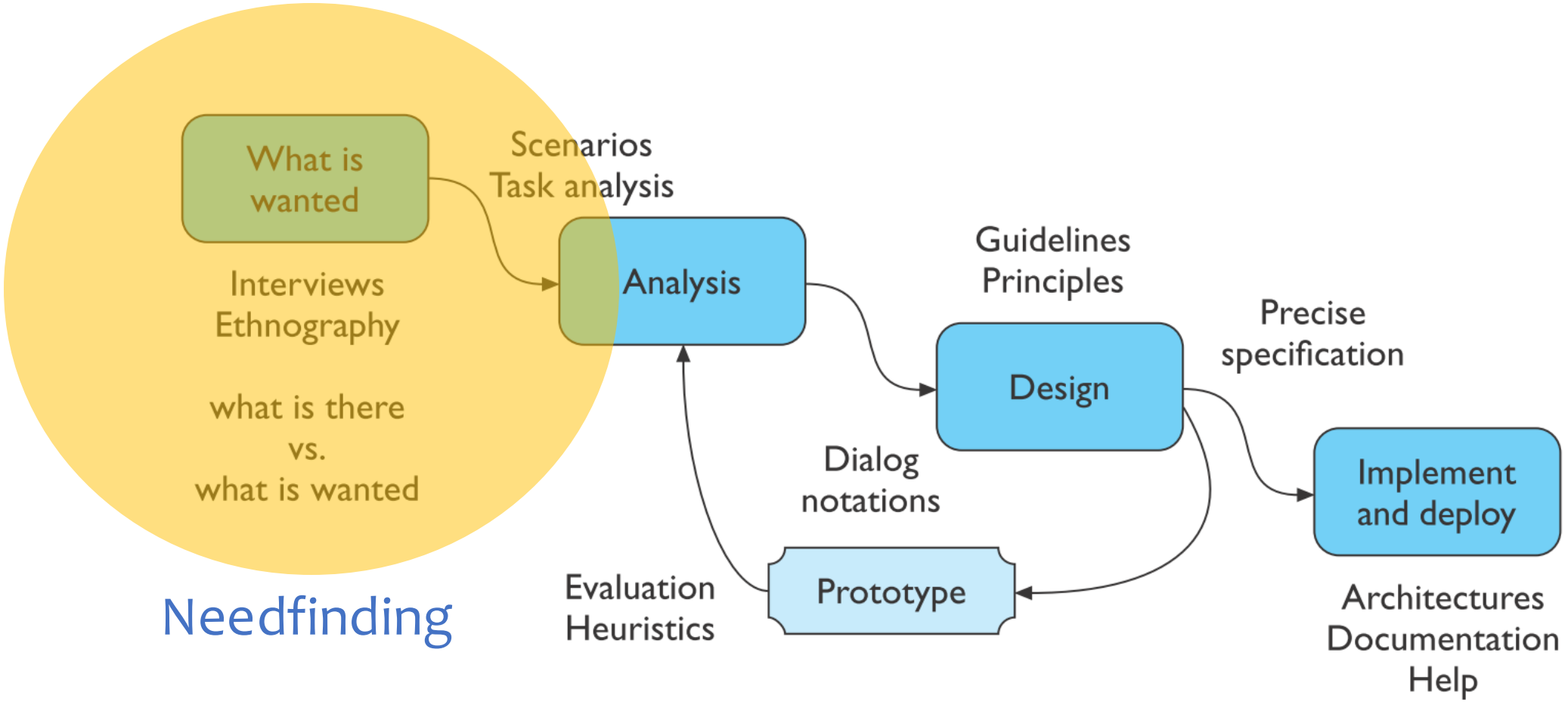
Example (2022) – Theme: ‘AR/VR for Education’

- Excerpts from the hi-fi prototype:



- Main limitations: no pitch-to-zoom, objects are put at the center of the scene, objects don’t respond to the law of physics, objects are hard-coded in a JS file.

Human-Centered Design Process



What Are Needs?

- "Human emotional or physical necessities"
- "Gaps in a system"
- They are **verbs**: activities and desires with which your user could use help
  - not nouns (solutions)
- Often, it is helpful to use the phrases 'needs a way to' or 'needs to be able to' to describe user needs
- They emerge directly from user traits or from contradictions between two traits
  - such as a disconnect between what they says and what they do

What is Needfinding?

- Needs: **gaps** in a system

- Needfinding: discovering opportunities by **recognizing** this gaps

What is Needfinding?

- Figure out the story of **what** and **why**…
- … and tell a new one!

Main Needfinding Questions

- Needfinding = **Finding Potential User Needs**
  - What do users need?

- That also requires
  - Who are the users?
  - How are they doing it, now?
  - What is the context in which they are doing it?
  - Can’t we just ask them?

Hall of Fame or Shame?

User Needs Edition

Beware: we are missing the general context here!

- Users need a faster horse
- Users need to have financial help
- Users needs a way to move faster from one place to another
- Users need to have more tools
- Users need to practice more with the appropriate tools
- Users need to be able to run faster

"Needs are human emotional or physical necessities. […]
Needs are verbs (activities and desires with which your user could use help), not nouns (solutions). […]
It can be helpful to use the phrases 'needs a way to' or 'needs to be able to' in your list of user needs."

Who are the Users?

- **Immediate Users:** the typical users who will engage with the product or service as soon as it's available. They represent the *primary target audience* and interact with the design under normal circumstances
- **Lead Users:** the *more advanced or experienced* individuals who face problems that the broader user base will likely encounter in the future. They often push the boundaries of how a product or service is used and can provide insights into future trends and innovative solutions.

Who are the Users?

TRY TO MAXIMIZE THEIR INVOLVEMENT!

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Who are the Users?

- **Extreme Users**: they fall at either end of *the spectrum in terms of how they use a product*—either using it far more intensely or minimally than most. Studying extreme users helps designers consider edge cases and understand how design can cater to diverse needs.
- **Domain Experts**: they have *deep knowledge and experience in the field* related to the product or service. They provide critical insights about best practices, standards, and potential pitfalls, helping the design process align with the technical and professional expectations of a specific domain.

What is The Context? A Sample Domain (1)

- Theme: Transportation
- Specific domain:

Target user(s)

- Immediate users:
- Domain experts:
- Lead users:
- Extreme users:

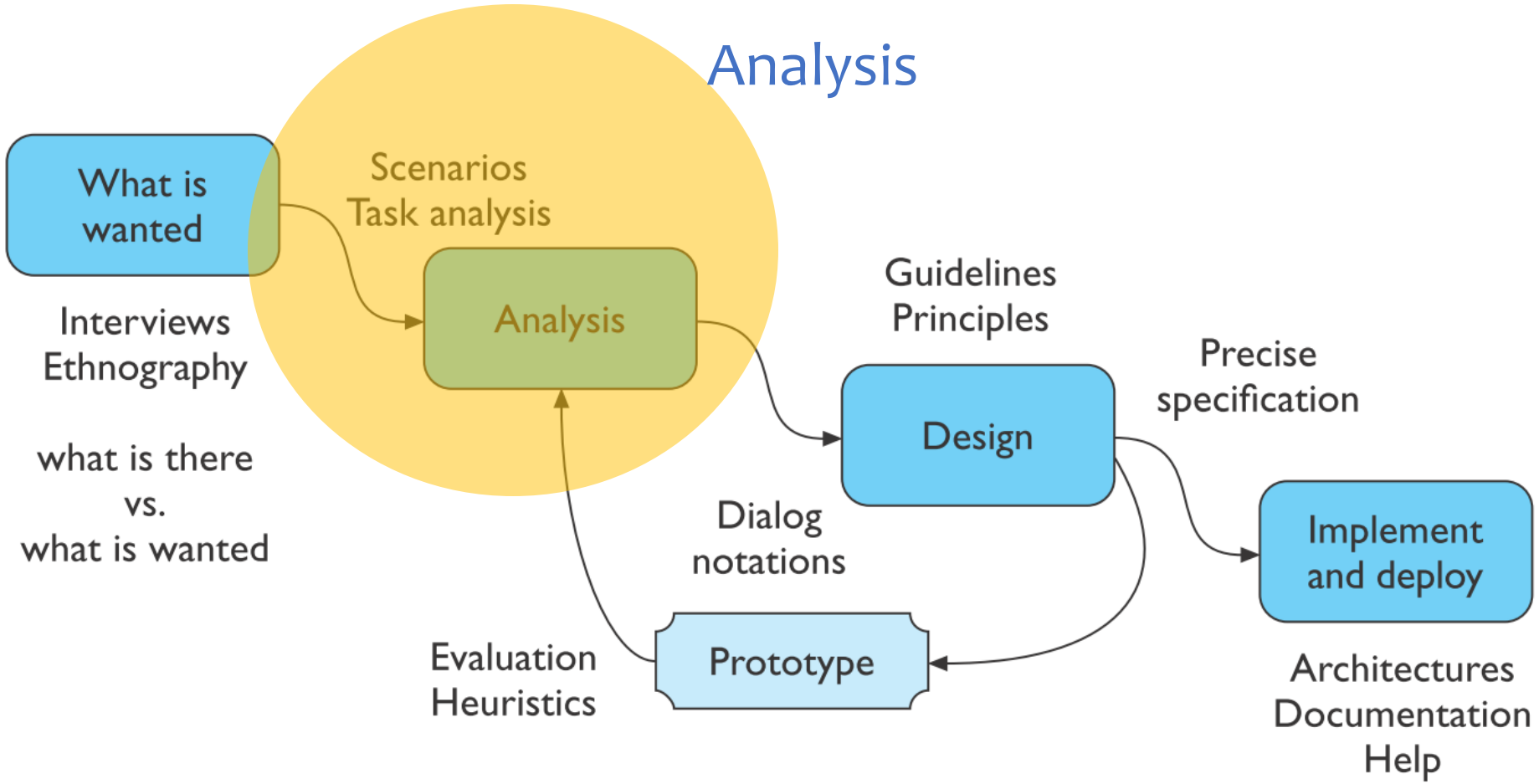
What is The Context? A Sample Domain (2)

- Theme: Health
- Specific domain:

Target user(s)

- Immediate users:
- Domain experts:
- Lead users:
- Extreme users:

Human-Centered Design Process



Analyzing and Synthetizing

- Create **design goals**
  - As an intermediate representation before the user interface design
- Make the user needs' analysis **explicit**
- Think about the *interplay* between the activity that someone has and the interface we offer
- **Represent** and synthetize the results of the analysis and the design goals

Tasks

- Task: the structured **set of activities**/high-level actions required to **achieve** a user goal
  - It says what a person *wants to do*, not how, while describing a *complete* goal
- Often, given a domain, you have a **mix** of tasks with different **complexity**
  - Simple tasks – common or introductory
  - Moderate tasks
  - Complex tasks – infrequent or for power/extreme users

Tasks

- Through tasks, you can study of the way people perform their activities
- Aim is to determine:
  - what they **do** (steps)
  - what things they **use** (artifacts)
  - how well they **succeed** (goals, pain points)

Sample Task: To Clean The House (I)

Sample Task: To Clean The House (I)

- **Steps**:
  - get the vacuum cleaner out
  - fix the appropriate attachments
  - clean the rooms
  - when the dust bag gets full, empty it
  - put the vacuum cleaner and tools away
- Must know and use different **artifacts**:
  - vacuum cleaners, their attachments, dust bags
  - cupboards, rooms
  - …

Sample Task: To Clean The House (II)

- **Goals**:
  - Here your *point of view* comes in
  - Removing dust? -> narrow goal
  - Tidying up the house after a party?
  - Hosting people for the dinner?
  - Having a satisfying evening? -> wide goal

Sample Task: To Clean The House (III)

- **Pain points**:
  - Narrow version: Why I need to empty the dust bag?
  - Broader version: Why I need a vacuum cleaner to have the house cleaned up?

Another Example of Task (with Steps)

- A person preparing an overhead projector for use would be seen to carry out the following steps:
  1. Plug in to main and switch on supply.
  2. Locate on/off switch on projector.
  3. Discover which way to press the switch.
  4. Press the switch for power.
  5. Put on the slide and orientate correctly.
  6. Align the projector on the screen.
  7. Focus the slide.

What is a Tasks?

- «A **task** is a **goal** together with some ordered set of **actions.**» (Benyon)

Goal

- A state of the application domain that a work system (user+technology) wishes to achieve.
- Specified at particular levels of abstraction.

Task

- A structured set of activities required, used, or believed to be necessary by an agent (human, machine) to achieve a goal using a particular technology.
- The task is broken down into more and more detailed levels of description until it is defined in terms of actions.

Action

- An action is a task that has no problem solving associated with it and which does not include any control structure.
- Actions are 'simple tasks'.

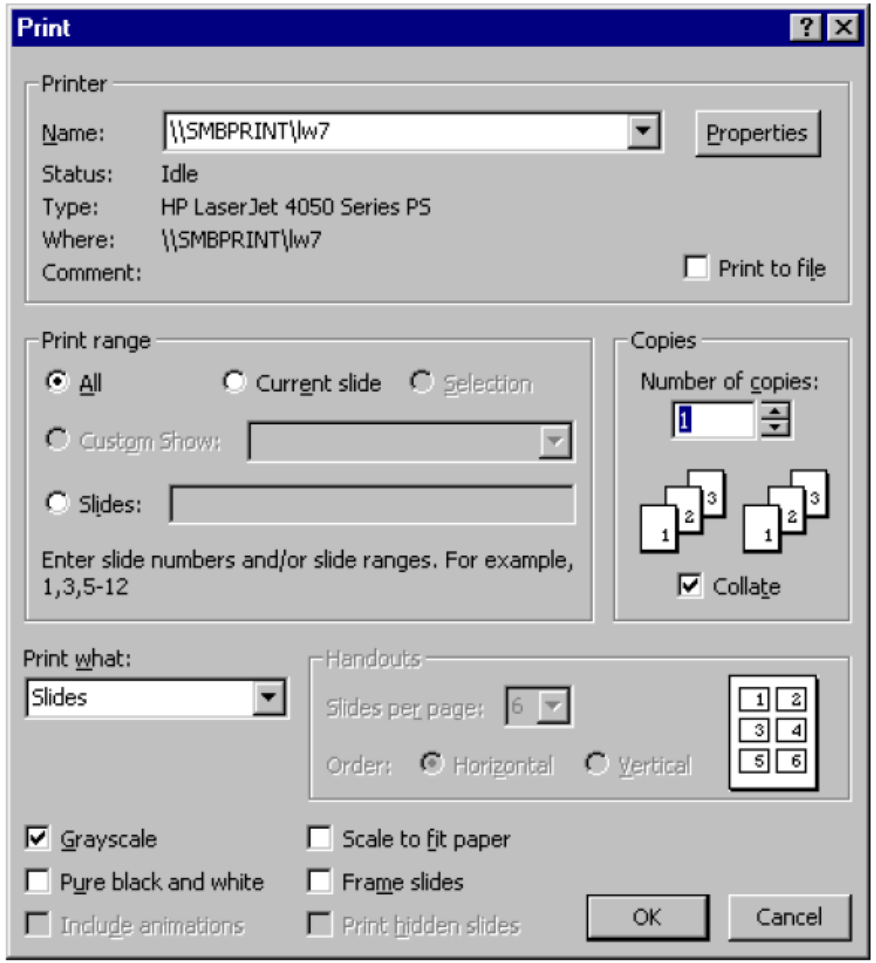
What You Learn by Analyzing Tasks?

- What your users' goals can be; what they are trying to achieve
- What users actually do to achieve those goals
- What experiences (personal, social, and cultural) users bring to the tasks
- How users are influenced by their physical environment
- How users' previous knowledge and experience influence:
  - How they think about their work
  - The workflow they follow to perform their tasks
  - The pain points they experience to perform the tasks

Why Is It Useful?

- Task analysis is the process of learning about ordinary users by observing them in action to understand in detail **how** they perform their **tasks** and achieve their intended **goals**
- Tasks analysis helps in:
  - Identifying the tasks that your application **must support**
  - Refining or re-defining your app's navigation or search
  - Application requirements gathering
  - Developing your content strategy and app structure
  - The initial stages of Prototyping
  - Performing usability testing

Example



- Tasks are used to plan for the layout of the application window
- Proximity and Boundaries reflect the decomposition of tasks
- Order of tasks is not mandatory

Tasks: Exercises

Goal

- Reflect on (good vs. bad) tasks
- Experiment with task analysis

Example of Good Tasks

- Service/App: Uber
- Simple task: signaling for a ride
  - *Is it a task? Why is it simple?*
- Moderate task: reach out to the driver to get a forgotten object
  - *Is it a task? Why is it moderate?*
- Complex task: become a driver for Uber
  - *Is it a task? Why is it complex?*

Example of Bad Tasks

- Service/App: Uber
- Open the app and tap on “Travel”
  - *Is it a task? Why is it bad?*
- Go into your account settings, check the messages, and then send a present
  - *Is it a task? Why is it bad?*
- …

Example of (Good) Tasks

- Service/App: Glovo/JustEat
- Simple task:
- Moderate task:
- Complex task:

Example of (Good) Tasks

- Service/App: ChatGPT
- Simple task:
- Moderate task:
- Complex task:

References

- Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale: Human Computer Interaction, 3rd Edition, Chapter 15 “Task Analysis”
- David Benyon: Designing Interactive Systems, Chapter 11 “Task Analysis”
- http://www.usabilitybok.org/task-analysis
- https://www.usability.gov/how-to-and-tools/methods/task-analysis.html

Acknowledgements

- Some icons from https://icons8.com

- Some material by
  - http://www.inf.ed.ac.uk/teaching/courses/hci/0708/lecs/tasks.pdf
  - https://www.tutorialspoint.com/human_computer_interface/design_process_and_task_analysis.htm
  - https://www.slideshare.net/alanjohndix/hci-3e-ch-15-task-analysis

- Most of the slides are adapted from those used in the "Human Computer Interaction" course of Politecnico di Torino
  - http://bit.ly/polito-hci

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