Human-Computer Interaction

2024/2025

Lab Class 3

Requirement Analysis

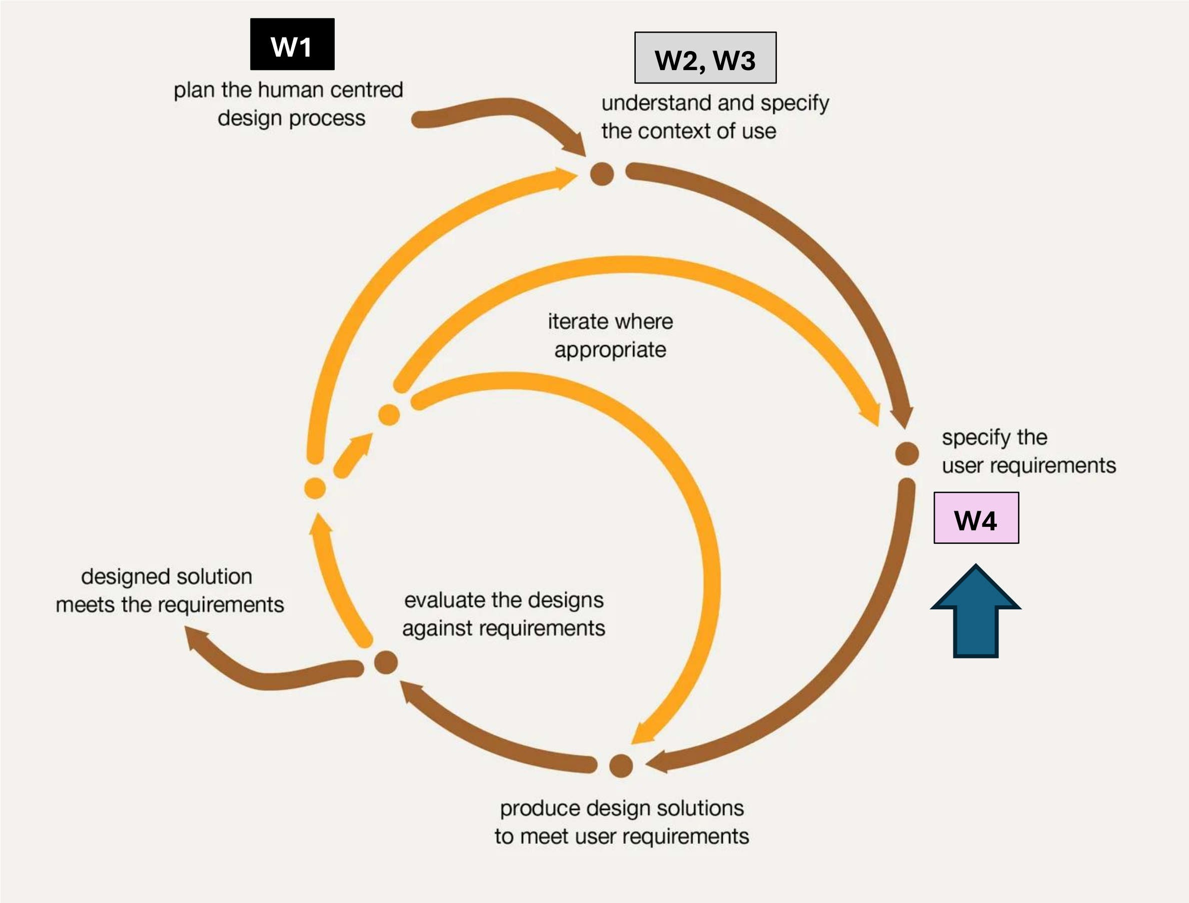
universidade
de aveiro

deti departamento de
electrónica, telecomunicações
e informática

HCD Lifecycle and HCI Lab Classes

W4
Requirement definition

So, what will our system need to do?


W1
plan the human centred design process
W2, W3
understand and specify the context of use
iterate where appropriate
specify the user requirements
W4
designed solution meets the requirements
evaluate the designs against requirements
produce design solutions to meet user requirements

Today, we will analyse scenarios,
identify tasks,
and generate requirements.

Why look into Hierarchical Task Analysis?

- **Situation Understanding**
  Breaks down tasks to reveal user needs, goals, and behaviours.
- **Human-Centered Design**
  Ensures workflows are intuitive and aligned with user expectations.
- **Optimization**
  Identifies redundancies and areas for process improvement.
- **Informed Decision-Making**
  Provides data-driven insights for better design/development choices.

Why look into Requirements?

- **Clarity & Alignment**
  Ensures everyone have a shared understanding of the goals.
- **Human-Centered Design**
  Helps create solutions that truly meet user needs and expectations.
- **Optimized Planning**
  Helps allocate resources effectively and streamline development.
- **Risk Reduction**
  Minimizes costly changes by addressing potential issues upfront.
- **Success Measurement**
  Provides clear criteria for evaluating the final product’s effectiveness.

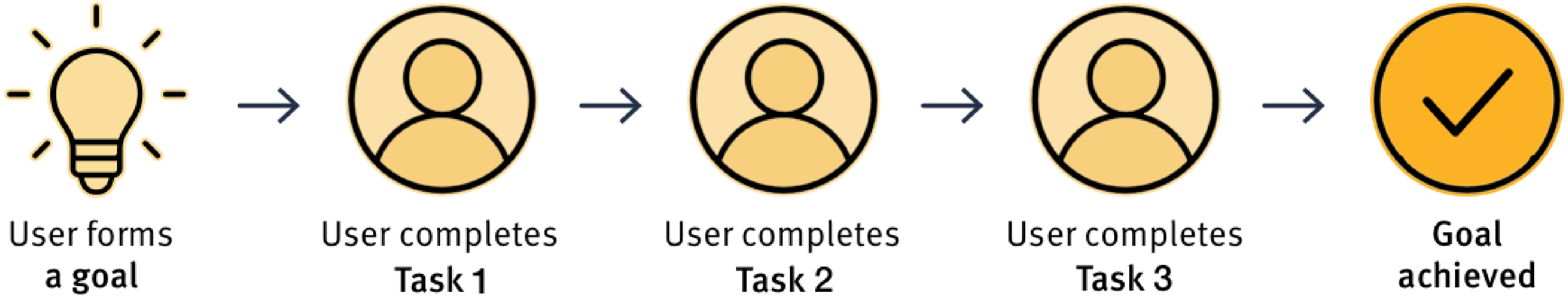
Hierarchical Task Analysis

Process of breaking down user actions to understand workflows, goals, and challenges

Hierarchical Task Analysis

- Study of how users' complete tasks to achieve their goals;

- A task refers to any activity that is usually observable and has a start and an end point.



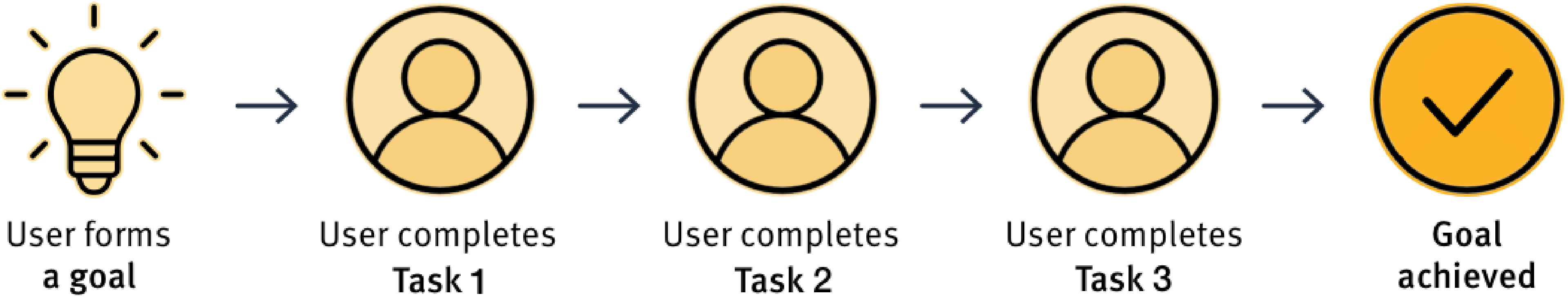
User forms a goal → User completes Task 1 → User completes Task 2 → User completes Task 3 → Goal achieved

Where to get detail: https://www.nngroup.com/articles/task-analysis/

Hierarchical Task Analysis

- The focus is on one user, their goal, and how tasks are carried out to achieve it;

- May address multiple subtasks, all in service of the same goal.



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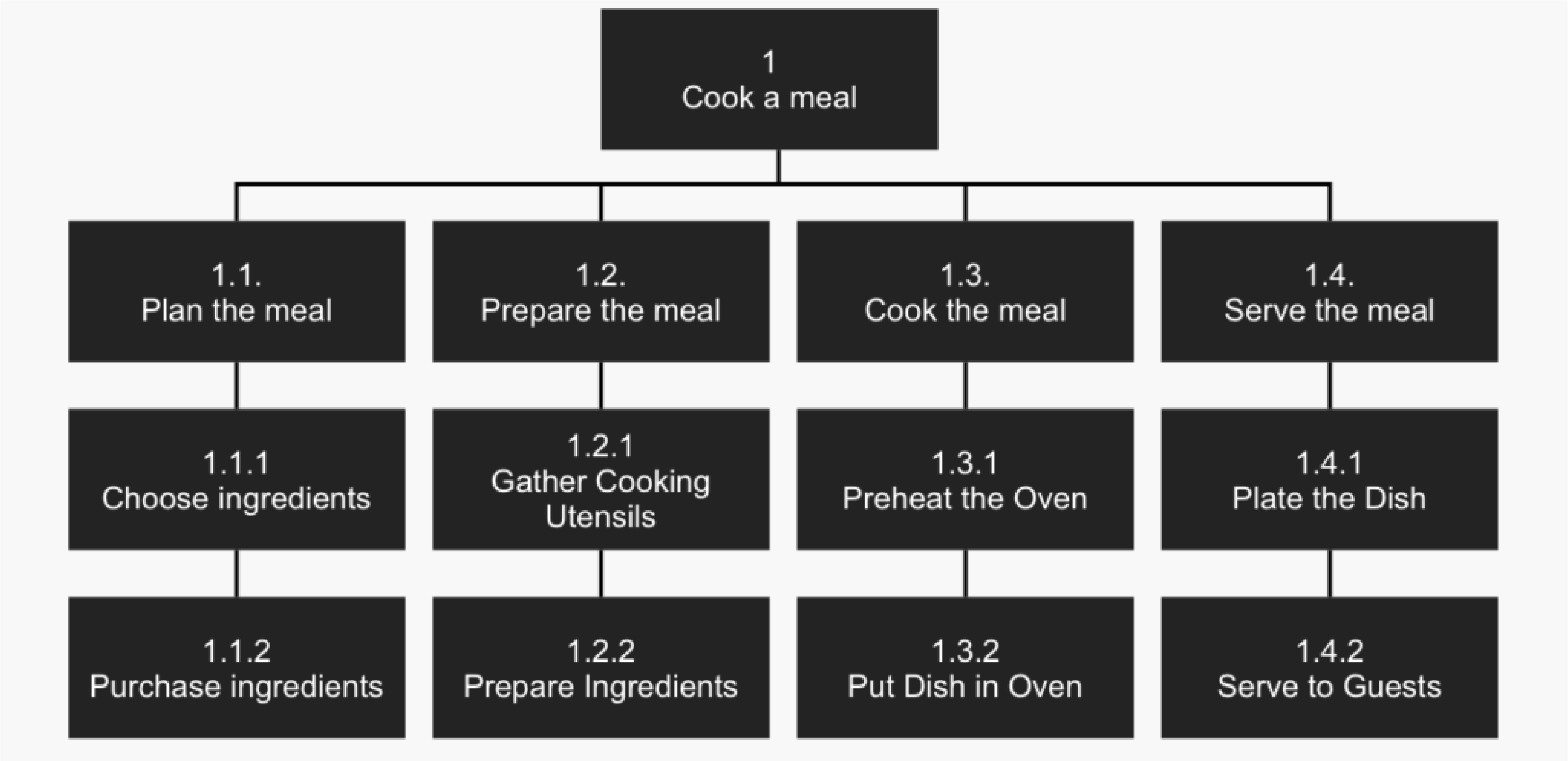
Hierarchical Task Analysis

- How to put in practice?
  - **Gather information** - on goals and tasks by observing and talking with users and/or subject-matter experts (last class subject);
  - **Analyse tasks** - performed to achieve goals to understand the overall number subtasks, their hierarchy, and their complexity.
- Can be used as a starting point for further assessment, for example during user studies.

Where to get detail: https://www.nngroup.com/articles/task-analysis/

Hierarchical Task Analysis

- Diagrams should be produced to document this analysis.



1
Cook a meal

1.1.
Plan the meal

1.2.
Prepare the meal

1.3.
Cook the meal

1.4.
Serve the meal

1.1.1
Choose ingredients

1.2.1
Gather Cooking Utensils

1.3.1
Preheat the Oven

1.4.1
Plate the Dish

1.1.2
Purchase ingredients

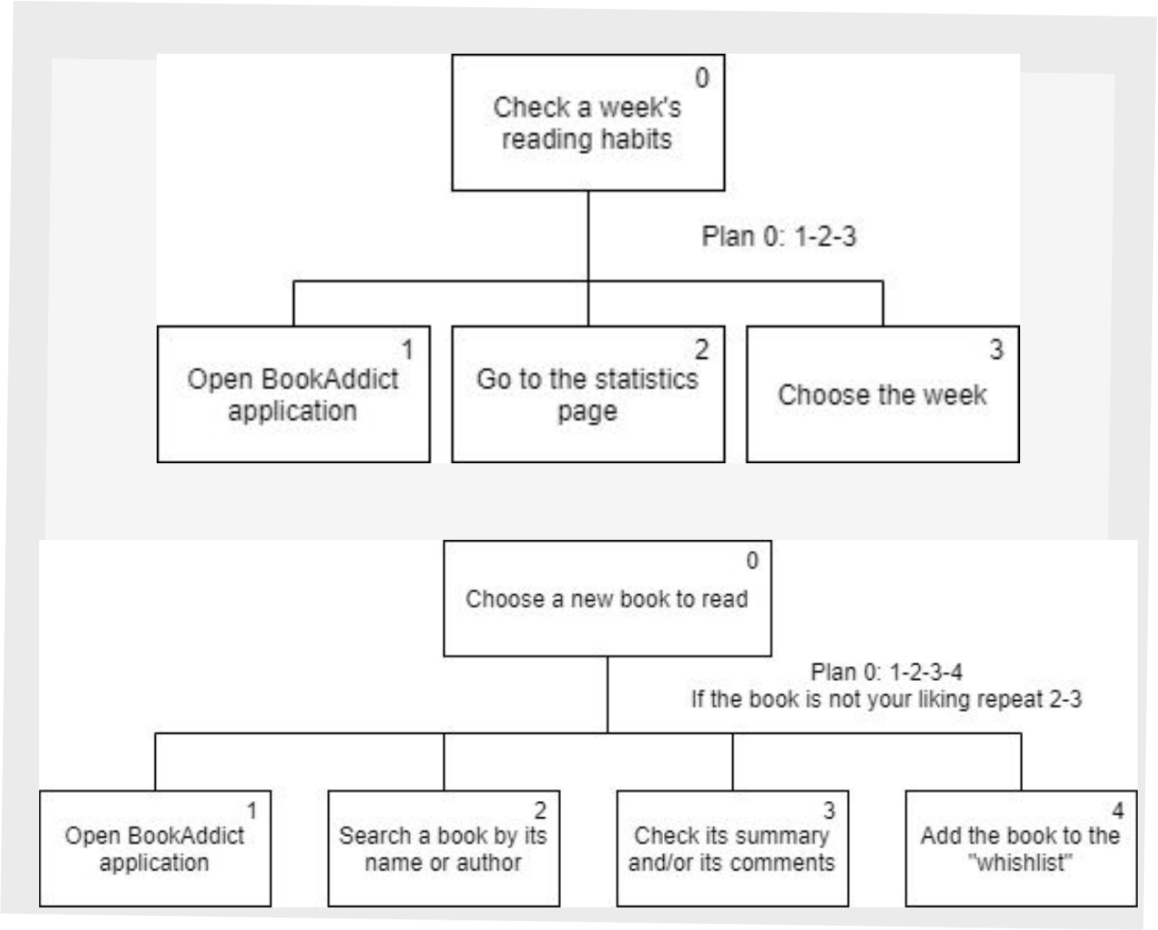
1.2.2
Prepare Ingredients

1.3.2
Put Dish in Oven

1.4.2
Serve to Guests

Example of Task Analysis

- **Simplicity**
- **Opinions**
- **Information**



0 Check a week's reading habits

Plan 0: 1-2-3

1 Open BookAddict application

2 Go to the statistics page

3 Choose the week

0 Choose a new book to read

Plan 0: 1-2-3-4
If the book is not your liking repeat 2-3

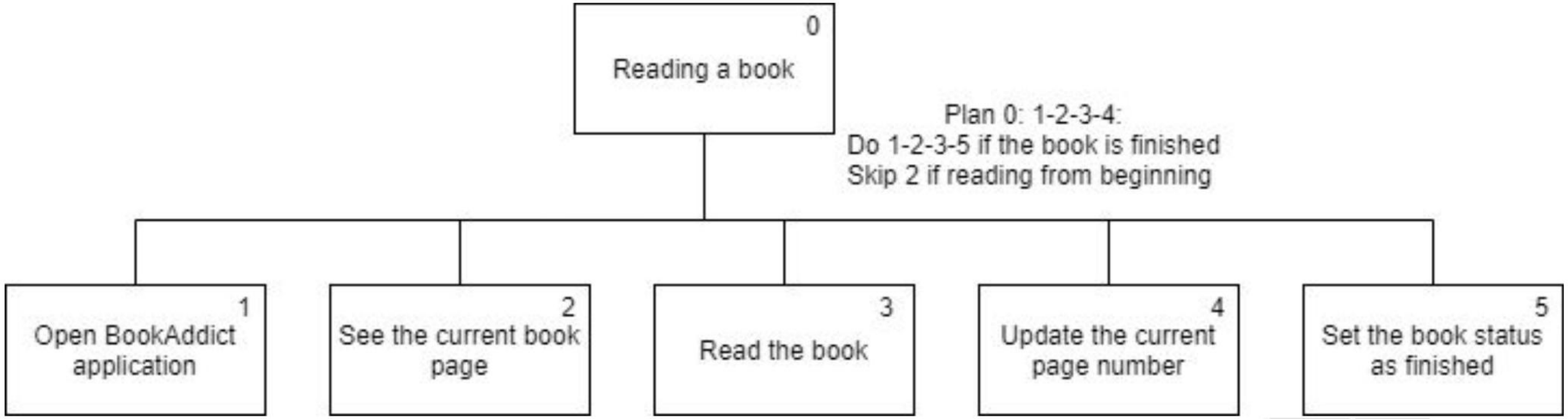
1 Open BookAddict application

2 Search a book by its name or author

3 Check its summary and/or its comments

4 Add the book to the "whishlist"

Example of Task Analysis



0 Reading a book

Plan 0: 1-2-3-4:
Do 1-2-3-5 if the book is finished
Skip 2 if reading from beginning

1 Open BookAddict application

2 See the current book page

3 Read the book

4 Update the current page number

5 Set the book status as finished

Requirements

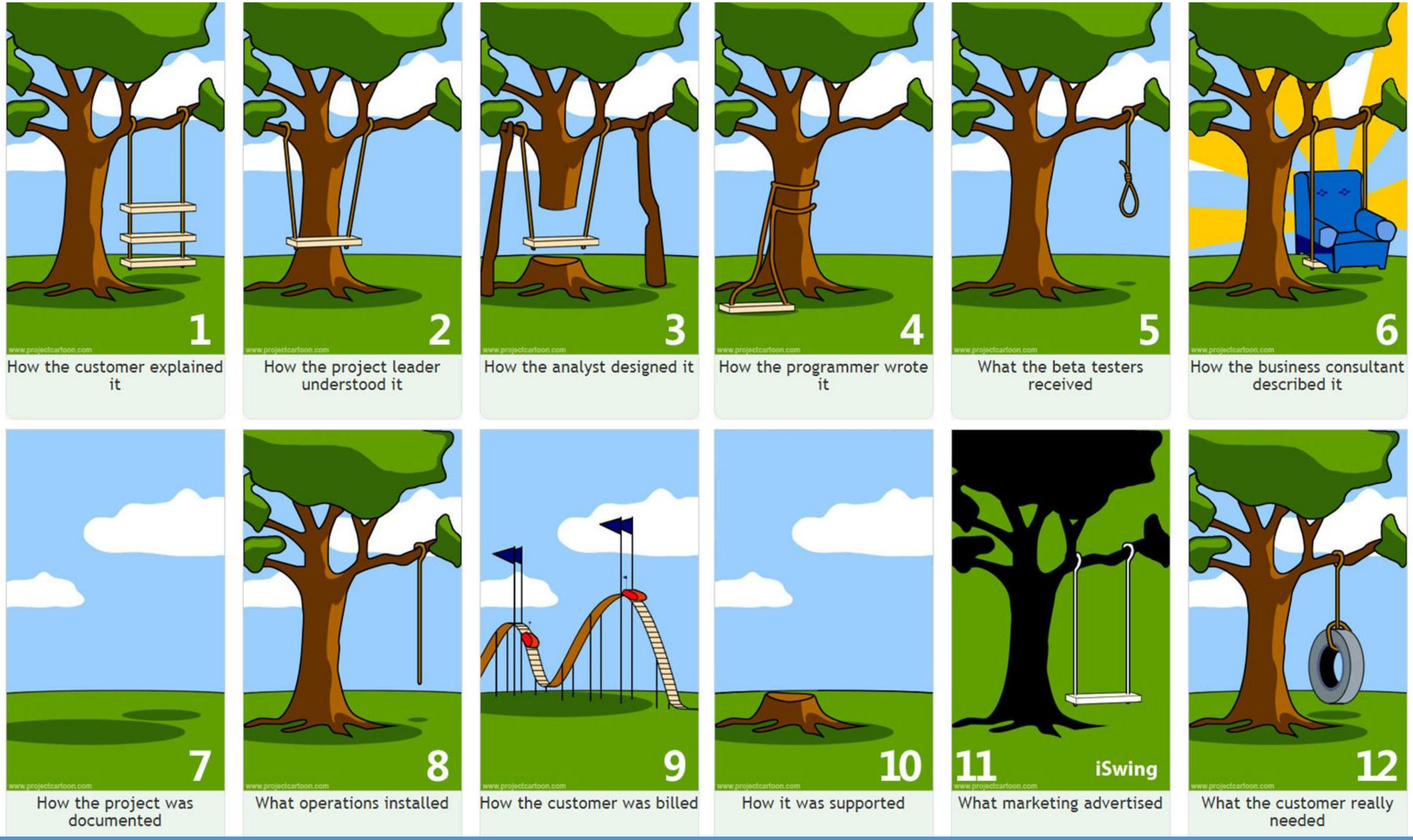
Specific needs, conditions, or capabilities that a system must fulfil

Requirements

- Set of conditions or capabilities that outline the characteristics of a system towards satisfying user needs;
- Help ensure that a system meets the needs of the users;
- Guide the design/development process, ensuring that the end system is user-friendly, accessible, and valuable.

Where to get detail: https://www.interaction-design.org/literature/topics/design-requirements

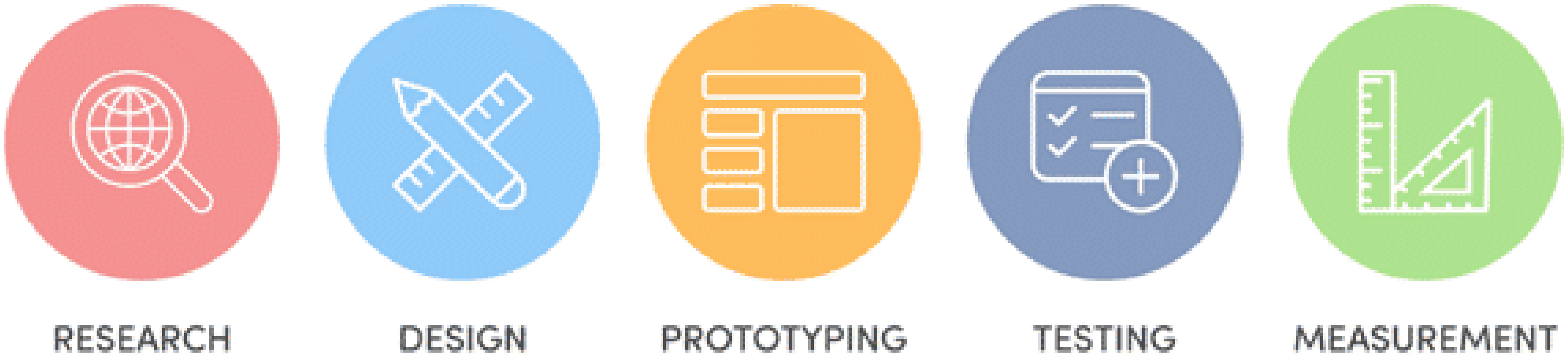
Improper requirements gathering


1
How the customer explained it
2
How the project leader understood it
3
How the analyst designed it
4
How the programmer wrote it
5
What the beta testers received
6
How the business consultant described it
7
How the project was documented
8
What operations installed
9
How the customer was billed
10
How it was supported
11
iSwing
What marketing advertised
12
What the customer really needed
www.projectcartoon.com

Where to get detail: https://www.interaction-design.org/literature/topics/design-requirements

Requirements

- To identify the requirements that best meet your users' needs, it’s essential to adopt a HCD approach;



- Functional vs Non-Functional Requirements.

Where to get detail: https://www.interaction-design.org/literature/topics/design-requirements

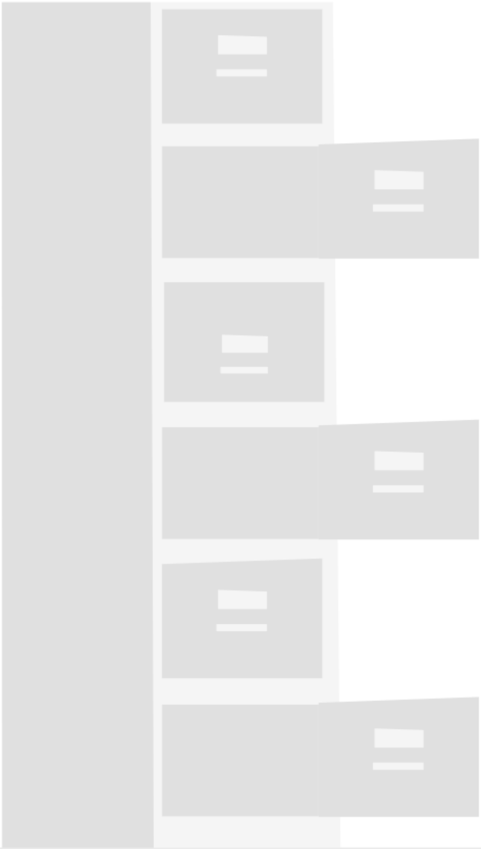
Functional vs Non-Functional

	Functional Requirements	Non-Functional Requirements
Definition	Define what a system must do (features, actions).	Define how a system must perform (quality, constraints)
Focus	User interactions, system operations, and behaviours.	Performance, security, scalability, and usability.
Examples	• The system must allow users to choose and purchase ingredients; • The system must guide users through meal preparation steps; • The system must provide cooking instructions, including preheating and others; • The system must include a serving process with plating and guest service instructions.	• The system should provide meal instructions in under 2 seconds; • The user interface must be visually appealing and easy to navigate; • The system should support multiple users planning meals simultaneously; • The recipe guidance should be available 99.9% of the time without downtime.
Measurement	Easy to test through inputs and expected outputs.	Often measured through performance metrics.
Importance	Ensures the system functions correctly.	Enhances user experience, reliability, and efficiency.

Example of Functional Requirements

- For the books being currently read, the application should record the last page read.
- The user should be able to search books by title and/or author.
- The user can have a “wishlist”.
- The application should record weekly and monthly stats.
- The user should be able to write comments on any book or book’s pages.
- The user should be able to see public comments made by other users on any book.

Example of Non- Functional Requirements



AVAILABILITY

The application must be available all the time.

SECURITY and PRIVACY

The user must login to use the application

DATA INTEGRITY

Across all devices with the same account, the data should be the same

USABILITY

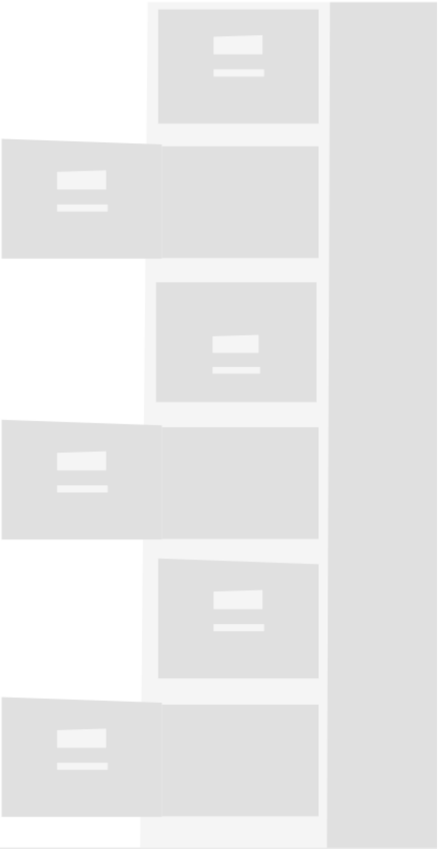
The application should be easy to learn and use

REGULATORY

The application must comply with the author's rights regulation

CAPACITY

The application should be able to store the data of a large number of users.



Useful Sources

- Cooper, A., Reimann, R., & Cronin, D. (2007). About face 3: the essentials of interaction design. John Wiley & Sons.
- Task Analysis: https://www.nngroup.com/articles/task-analysis/
- Requirements: https://www.interaction-design.org/literature/topics/design-requirements

Check the slides for lecture 4, in Teams

Let’s Get to Work

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.dreamstime.com%2Fphotos-images%2Fdirty-drill.html&psig=AOvVaw1sw8MH29hc74rKgblwnRL5&ust=1739783750289000&source=images&cd=vfe&opi=89978449&ved=0CBQQjRxqFwoTCNDr39vtx4sDFQAAAAAdAAAAABAR

For this class…

- Start by identifying a set of **5/6 main tasks** for the scenarios established in the previous class

- Start defining relevant **requirements** according to what you want to achieve with your iterative system

- **Register** all the information in your group’s **logbook** ss:ihc:p1:v0

Tasks to complete until next class…

- **Finalize the requirement list**
- **Prepare the Milestone 1 presentation** (Check the template suggested - 15 minutes maximum)
- You will need to **deliver** the current version of the **logbook**