Human-Computer Interaction 2024/2025

Lab Class 1

Current Competitors and Context

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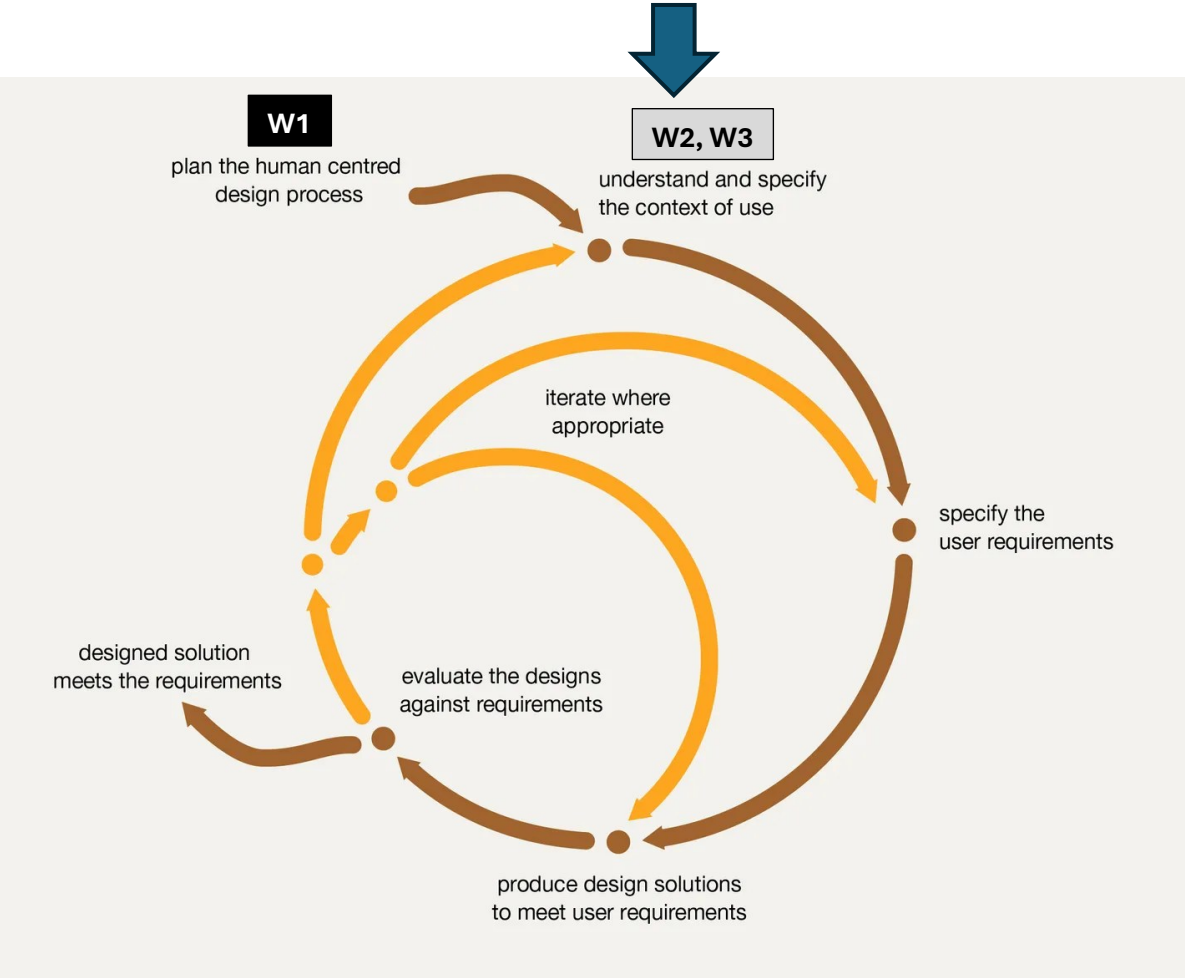
HCI Lab This Week

W2
Understand and specify context of use

Today we will clearly state our problem and investigate existing practise, competitors or similar approaches (even if for other domains)



Why look into current practice and solutions?

- Identify Best Practices
  Learn what works well in existing solutions.
- Spot Gaps & Opportunities
  Find unmet user needs and innovate.
- Avoid Reinventing the Wheel
  Save time by leveraging proven concepts.
- Differentiate Your Product
  Ensure your solution stands out.
- User Expectations & Standards
  Align with industry norms for usability.

What if I am the first one thinking about this? Look for similar approaches in other areas

- Extract Valuable Insights
  Similar challenges often have tested solutions.
- Adapt Proven Strategies
  Apply concepts from different domains.
- Avoid Common Pitfalls
  Learn from past mistakes in related areas.
- Understand User Expectations
  Even new solutions should feel familiar.
- Inspire Innovation
  Cross-industry ideas can spark creativity.

Analysing current scenarios
And getting to know users

- Try to understand aspects including:
  - What is their interest and goals in the topic
  - What are the main tasks they do or would want to do
    - What steps are involved?
  - Do they use any kind of method or tool to support it?
    - What are positive aspects in the experience?
    - What are negative aspects?
  - Do they have suggestions on how tools they use might be improved?

A good source for things to consider to do a user interview is:
https://www.nngroup.com/articles/user-interviews/

Analysing Competitors

From an HCI Perspective

- Identify usability issues and best practises
- Identify potential usability barriers
- Break down how users accomplish tasks in competitor solutions
- Understand current user frustrations and expectations
- Identify strength, weaknesses, opportunities, and threats

Today, we will look into analysing competitors

Heuristic Evaluation

Take a checklist of good practises and check if they were considered!

Let’s First Consider an Example

Imagine you are buying a used car and have several possibilities, but you don’t really know how to analyse them

You talk with your uncle who is a mechanic, and he teaches you what are the most important points to look for

You make a list!

Buying a car checklist

- Exterior condition (dents, scratches, rust)
- Tire wear
- Engine noise and leaks
- Mileage
- Fluid levels
- Interior condition (seats, dashboard, controls)
- Brake performance
- Test drive (acceleration, steering)
- Suspension and alignment
- Vehicle history and documentation

Having this list, how can you analyse a car?

Buying a car checklist

- Exterior condition (dents, scratches, rust)
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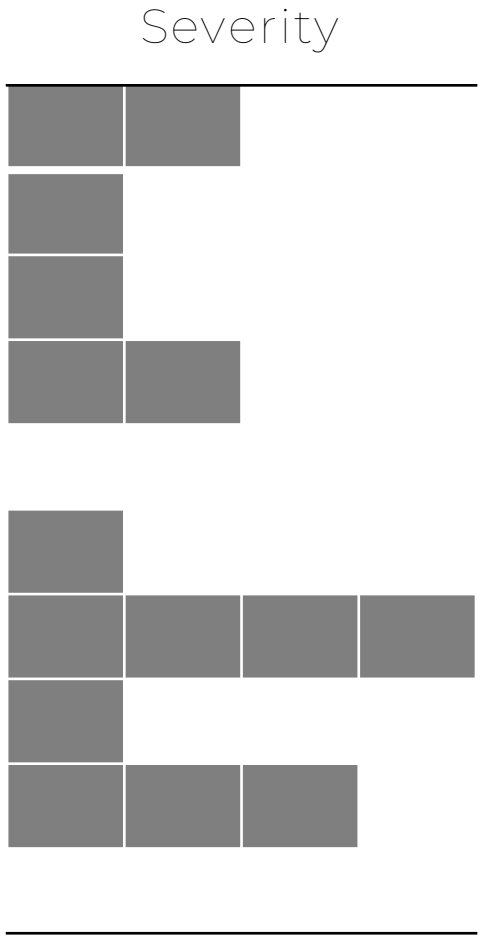


What is Heuristic Evaluation

- Involves a small set of analysts judging the UI against a list of usability principles (‘heuristics’)
- Quick, cheap, and easy evaluation of a UI design;
- Most popular usability inspection method; yet it is subjective

Nielsen's Usability Heuristics

Visibility Of System Status

Match Between System & Real World

User Control And Freedom

Consistency And Standards

Error Prevention

Recognition Rather Than Recall

Flexibility And Efficiency Of Use

Aestetic And Minimalist Design

Help Users With Errors

Help And Documentation

Where to get detail: https://www.nngroup.com/articles/ten-usability-heuristics/

Visibility of System Status

The design should always keep users informed about what is going on, through appropriate feedback within a reasonable amount of time.

- Does the design clearly communicate its state?
- Is feedback presented quickly after user actions?

Match Between System and Real World

The design should speak the users' language. Use words, phrases, and concepts familiar to the user, rather than internal jargon. Follow real-world conventions, making information appear in a natural and logical order.

- Will user be familiar with the terminology used in the design?
- Do the design's controls follow real-world conventions?

Heuristics ...

The Nielsen Norman Group site has concise information on what each heuristic means

https://www.nngroup.com/articles/ten-usability-heuristics/

There is also a video for each of the heuristics.

Nielsen's are usability heuristics

What is usability?

Usability is the extent to which a system enables users to achieve specific goals effectively, efficiently, and satisfactorily in a particular context of use, considering tasks, users, and environment.

How to Perform an HE

Performed by several evaluators (one person never finds all problems)

Evaluators should work independently:

- First get a general idea of the UI;
- Then perform a detailed inspection using a set of heuristics;
- List usability problems (heuristics and severity degree).

Findings of all evaluators should be integrated in the same report;

The report should help the development team prioritize problem fixing.

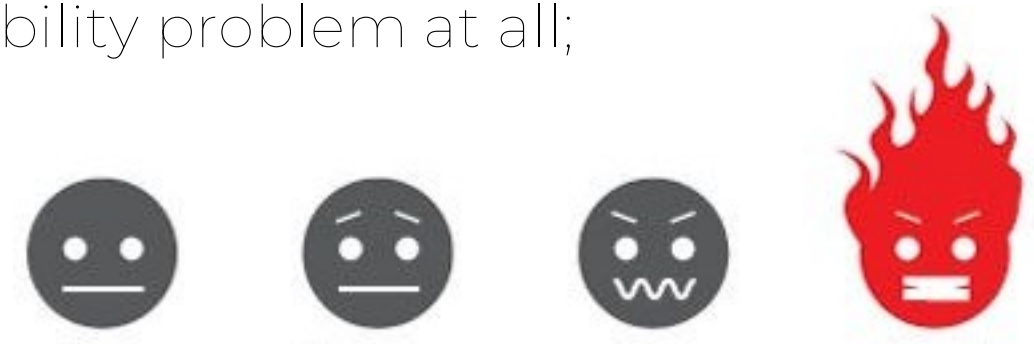
Severity Rating

Combination of three factors:

- The frequency with which the problem occurs;
- The impact of the problem if it occurs;
- The persistence of the problem.

The following 0 to 4 rating scale can be used to rate the severity of usability problems :

- 0 - I don't agree that this is a usability problem at all;
- 1 - Cosmetic problem;
- 2 - Minor usability problem;
- 3 - Major usability problem;
- 4 - Usability catastrophe.



Example

Issue	Help button at the bottom of the page. May be difficult to find
Heuristic	Help and documentation
Severity	1

Issue	No information on how to leave
Heuristic	Recognition rather than recall/ User control and freedom
Severity	2

Gathering all in a report

- After all evaluators did the HE, meet and gather the results
- If an evaluator reports an issue that the others have not mentioned, they analyse it and decide what they think
- When reporting the results of a HE, you should always explain, first, the method used to do it!

	Alice	Bob	Carol	David	Median
Issue 1	4	3	3	2	3
Issue 2	3	4	2	2	…
Issue 3	3	4	4	3	…
Issue 4	3	2	2	3	…
Issue 5	3	4	3	0	…
Issue 6	2	0	2	1	…

Cognitive Walkthrough

Consider a task and try to understand if, step-by-step, a new user would know how to proceed

Cognitive Walkthrough (CW)

Involves systematically simulating the thought processes of users to identify potential usability issues;

Does not involve external participants (light on resources);

May be done by a single individual. Should be conducted by a group of people;

Take the role of a specific person, go thought the user flow and assess how easy it is to use a system.

Conducting a Streamlined* CW

1. Identify tasks – those that are important for the overall purpose of the system or in need for a deeper analysis;

2. Perform task analysis – sequence of steps or actions required by a user to accomplish a task, and the system responses;

For instance, “buy a book on Amazon”:

1. Search for the book
2. Identify the desired book from results
3. Add book to cart
4. Proceed to checkout

* It is named streamlined because it uses a simpler procedure with less questions than original CW

Conducting a Streamlined CW

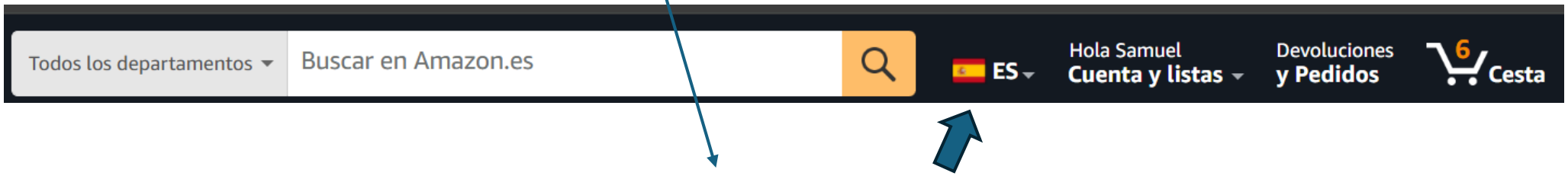
3. Analyse Subtasks – from the perspective of a new user, analyse performing the task, asking, for each subtask:

1. Will the user know what to do at this step?
2. If the user does the right thing, will they know that they did the right thing, and are making progress towards their goal?

- Answer yes, or no, and justify your answer from the perspective of the user

Example: “Change the language at amazon webpage”

Subtasks	Will the user know what to do at this step?		If the user does the right thing, will they know that they did the right thing, and are making progress towards their goal?	
	Yes	No	Yes	No
1. Click on the language icon	X		X	
2. Select language from the list	X		X	
3. Click on the save changes button	X		X	



Responses need to have a reason: Yes, the icon is clearly visible at the top

Summarizing Insight

Besides properly keeping all the gathered data

The HCI SWOT Analysis

SWOT Element	HCI Focus	Example in UX/UI
Strengths	What the system does well in terms of usability, interaction design, and user experience.	"Simple navigation and clear interface make it easy for first-time users."
Weaknesses	Usability flaws, accessibility issues, cognitive load problems.	"Inconsistent button placement confuses users."
Opportunities	Emerging technologies, new UX trends, ways to improve user engagement.	"Adding voice interaction could enhance accessibility."
Threats	Competitor advantages, changing user expectations, technology limitations.	"A competing app offers better personalization features."

Useful Sources

- How to perform a heuristic evaluation: https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/

- What is the meaning of each heuristic: https://www.nngroup.com/articles/ten-usability-heuristics/

- How to perform a cognitive walkthrough (note that it is not the streamlined version. So, you will only do 2 questions: https://www.nngroup.com/articles/cognitive-walkthrough-workshop/

Let's Get to Work

Register the group and idea

Access the form below and insert the requested information only if your idea has been approved by the lab teacher

https://forms.gle/5K83jg7cwZi5kJh17

For this class...

- How is current practice in the field you chose? How do people do it, nowadays?
- Who are the competitors? Choose the most representative / important
- Prepare Heuristic Evaluation docs; ask the teacher if you need help
- What are the 2/3 most important tasks that need to be done in these competitor systems? Prepare Cognitive Walkthrough

Github rep for Logbook

https://github.com/UA-DETI-41549-HumanComputerInteraction/41549_HCI_LogBookTemplate

Tasks to complete until next class...

- Prepare your interview questions and, if possible, interview a few users
- Complete a heuristic evaluation for the selected competitor. Each member of the group does it individually and then you gather the results
- Apply streamlined cognitive walkthrough to the 2/3 tasks considered more important for the main competitor
- Fill in the HCI SWOT table
- Register all the information in your group's logbook