Human-Computer Interaction

L.EIC - FEUP - 2022

Teachers

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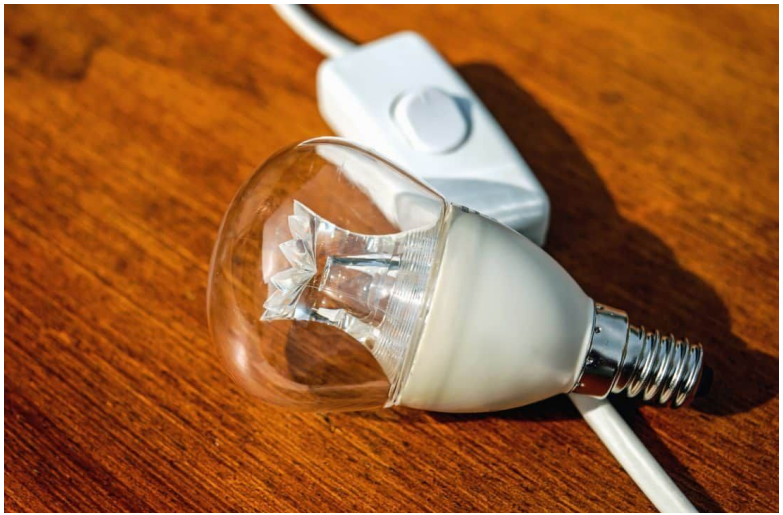
What were the first "devices" you used today?

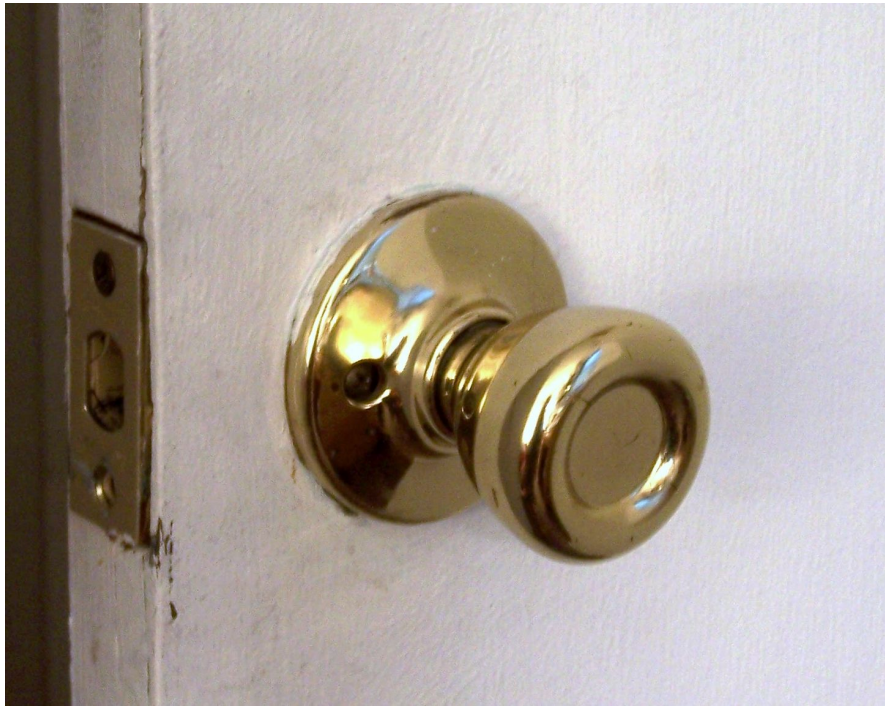
Light switch?



Watch?

Phone?

Door Handle?



Faucet?

Coffee machine?

Remote Control?

Some questions...

- What do they have in **common**?
- Why are there **different solutions** for **similar purposes**?
- Are they all (any?) **good solutions**?
- How did someone **came up with such solutions**?

Goals for today

- What is **Human-Computer Interaction**
- Main differences between **User Interface (UI)** and **User Experience (UX)**
- HCI **Design philosophy**
- Some HCI “**Mantras**”
- Course structure and next steps

Human-Computer Interaction

Human-Computer Interaction

- What does it study?
- What is the goal?
- What are interfaces?

Look around...

- (Almost) Everything is (should be) **designed to be used**
- Technology is a **commodity**
- User Experience is now a **differentiating factor**

UX Job Market Growth

Atlassian

1:25 → 1:9

2012 2017

1:10 → 1:6

2013 2017

1:5

2017

LinkedIn

1:11 → 1:8

2010 2017

UBER

1:8

2017

IBM

1:72 → 1:8

2012 2017

Multidisciplinary

- **Human**: User, others, social context
  - **Behavioral Sciences**
- **Computer** (Machine): Hardware/Software
  - **Computer science/engineering**
- **Interaction**: Relation/communication Human-Machine
  - **Design**
- And more...

User Interface - UI

- “Visible” (**human-stimulating**) part of the system
  - May include sound, haptics…
- Enables the users to
  - **Interact** with the system
  - **Perform** their tasks
  - Get **feedback/information** from the system
- The User operates/interacts **over/through** the Interface

HCI Definition

Human-computer interaction (HCI) is a **multidisciplinary** field of study focusing on **the design of computer technology** and, in particular, **the interaction** between humans and computers.

https://www.interaction-design.org/literature/topics/human-computer-interaction

User Experience (UX)

- What is it?
- How does it relate to UI?
- How is it different from Usability?

User Experience (UX)

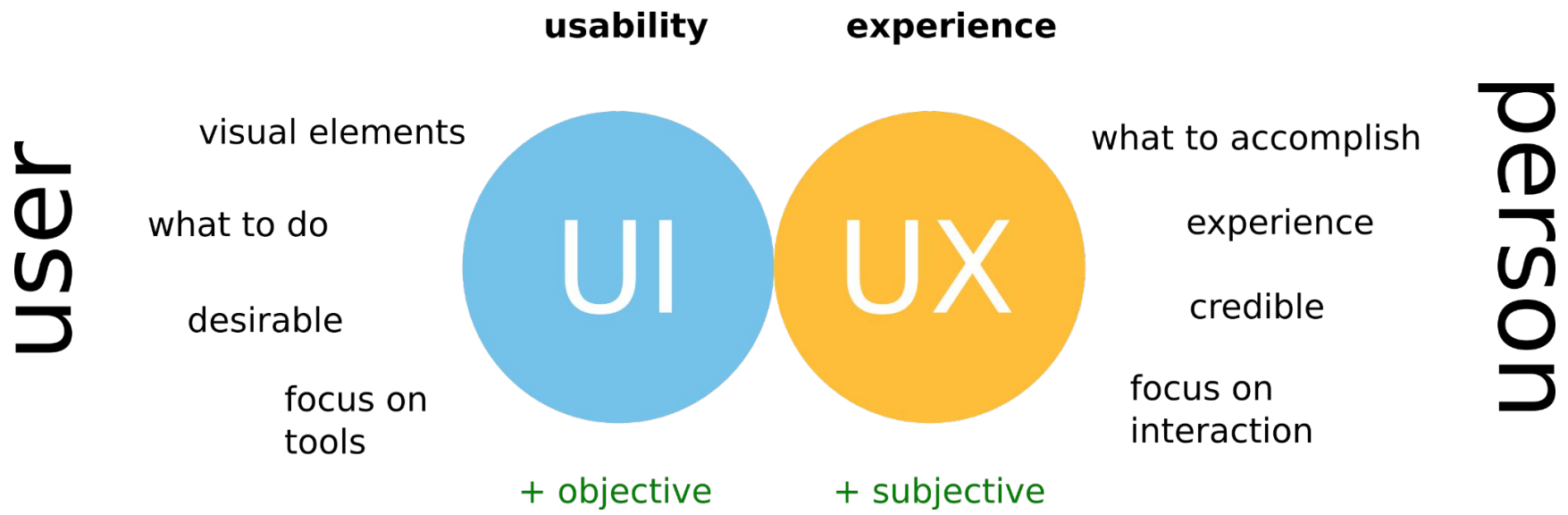
- The **whole experience** with a system, technology, device
- Not only the direct interaction with the artefact, but the **overall context**
    - Some include marketing, store display, unboxing, aesthetics, support (Customer Experience, CX)

User Experience (UX)

- Involves **affective component**
  - **Emotions** while using

- One does not *design the* user experience, but **DESIGNS FOR** an user experience

UI vs UX


usability
experience
user
person
visual elements
what to do
desirable
focus on tools
UI
UX
what to accomplish
experience
credible
focus on interaction
+ objective
+ subjective

Some Design Myths

- “Good design means good graphics”
- “Marketing dept. knows the users”
- “Good design is common sense”
- “The interface can be designed in the end”

~~"Good design means good graphics"~~

- Visuals are **important** to communicate,
  - but **not enough** for good interaction
- The user's perspective has to be considered in different aspects:
  - **Goals**
  - **Expectations**
  - **Tasks...**

~~"Marketing dept. knows the users"~~

- Marketing is (for the most part) focused on demographics
  - Not on the **human behaviour** while using
- What the users report is often different of what they do and feel
  - **User studies** and **observation** are key

~~"Good design is common sense"~~

- If it is that simple, why are there **so many bad web sites** and apps?
- **Common** sense is **not necessarily right** (and not so common ;)
- It takes **experts and work** for good design

~~"The interface is designed in the end"~~

"... The **needs of the users** should **dominate** the design of **the interface**, and the needs of the interface should **dominate** the design of **the rest of the system.**"

[Don Norman]

- **User needs** -> **Interface Design** -> **Functionality**
- Design flaws detected at the end **cost a lot** of time and money

User-Centered Design (UCD)

"... an **iterative** design process in which designers **focus on the users and their needs** in each phase of the design process.

... designers use a mixture of **investigative methods and tools** (e.g., surveys and interviews) and **generative** ones (e.g., brainstorming) to develop an **understanding of user needs**.

https://www.interaction-design.org/literature/topics/user-centered-design

HCI Mantras

- Know your users
  - Physical, cognitive, sensorial abilities
  - Social context, background, etc.
  - User research will be part of this course

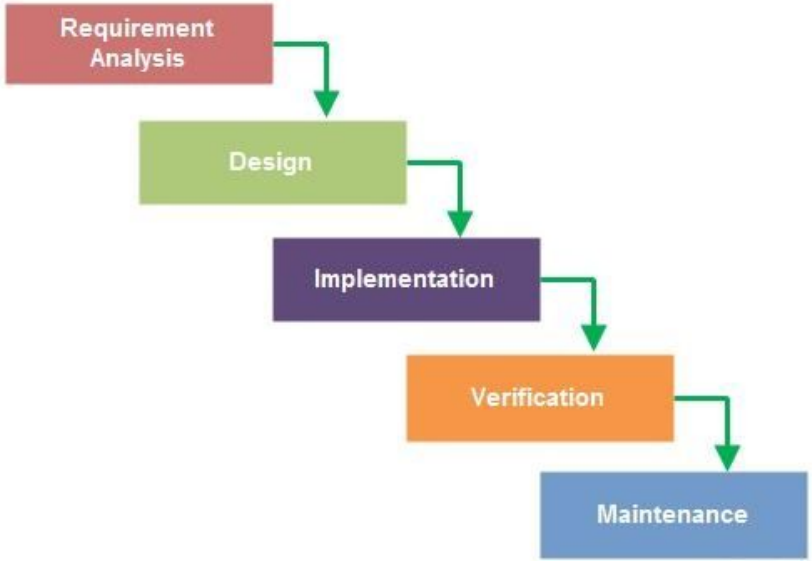
HCI Mantras

- “The user is not like me”
  - To think the opposite is the most common mistake
  - You (we) are not typical users
  - You (we) adapt to bad interfaces and think they are ok

Design Process

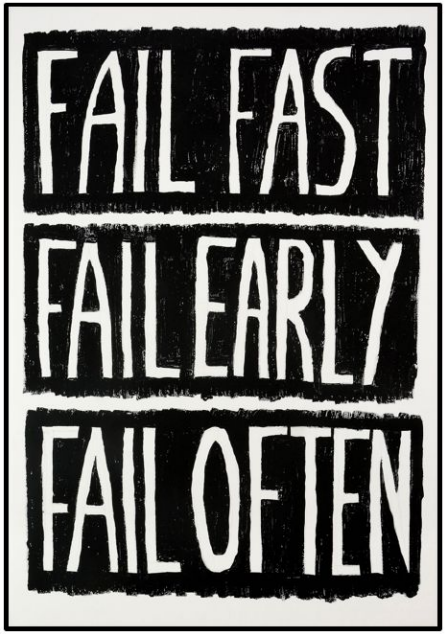
~~Waterfall model?~~

Problems: Assumes all is completely known and specified very early on, only tests functionally after implementation



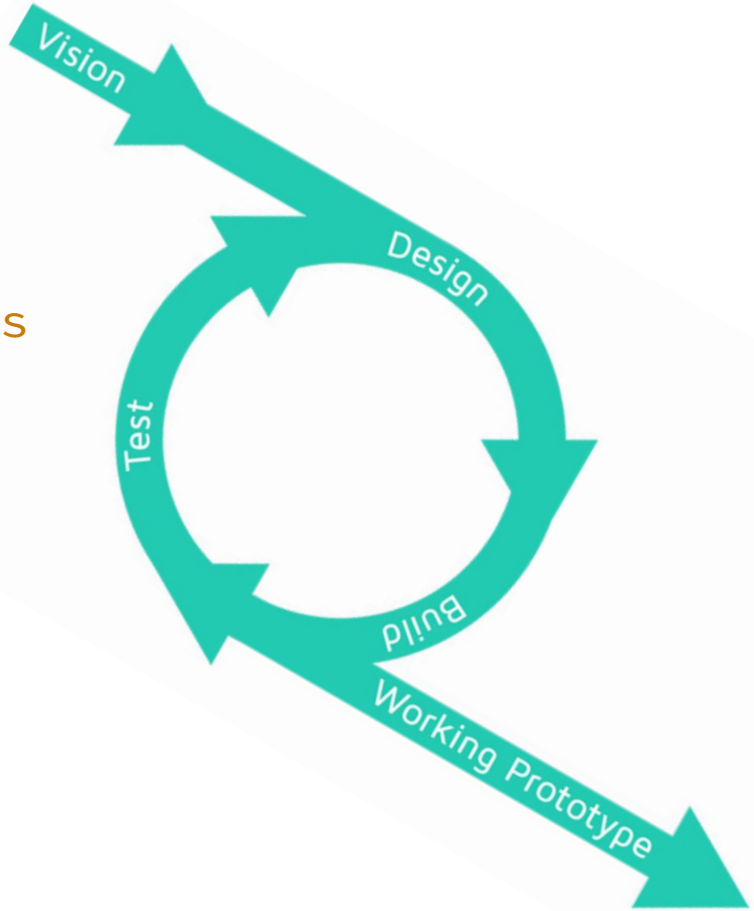
Fail Fast Philosophy

- Fail:
  - fast
  - early
  - often

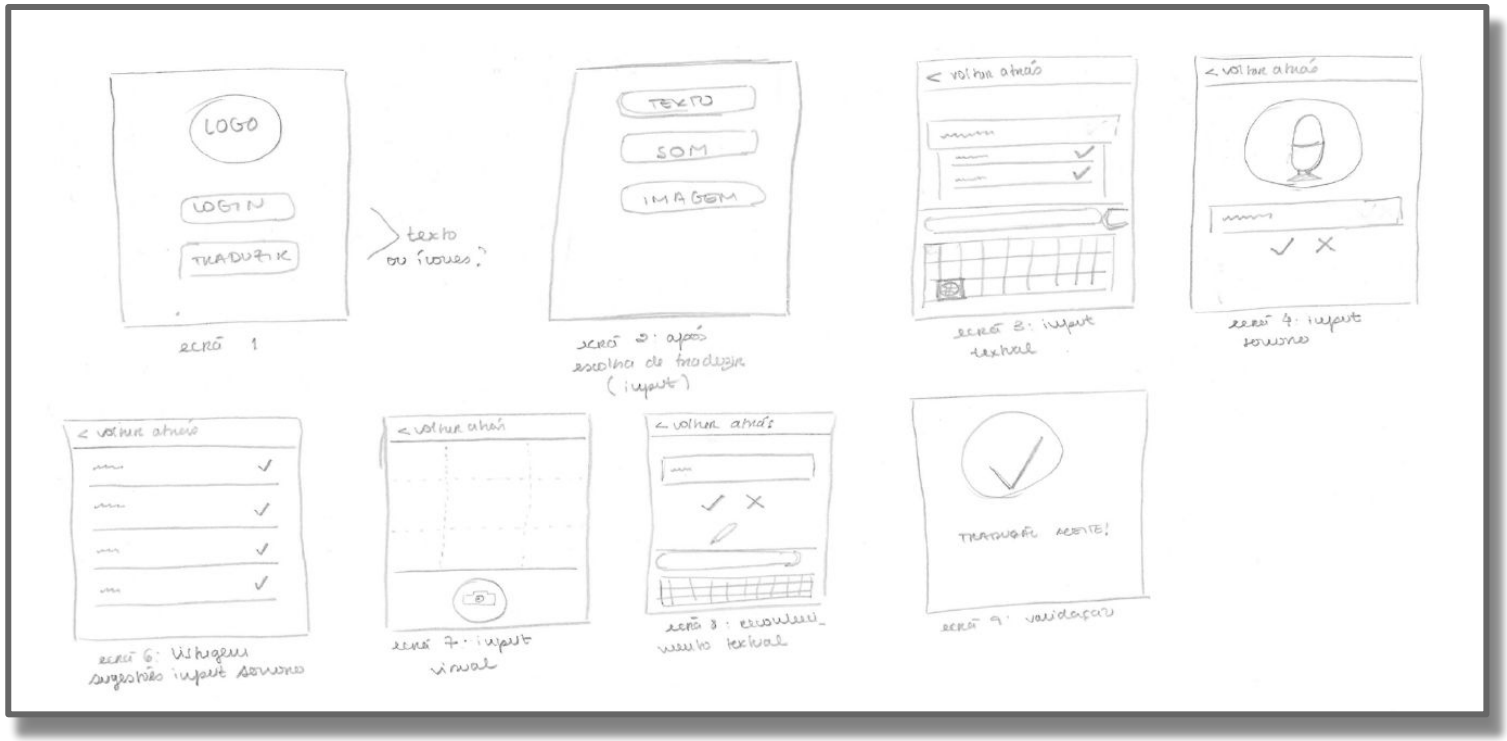


Iterative Design Process

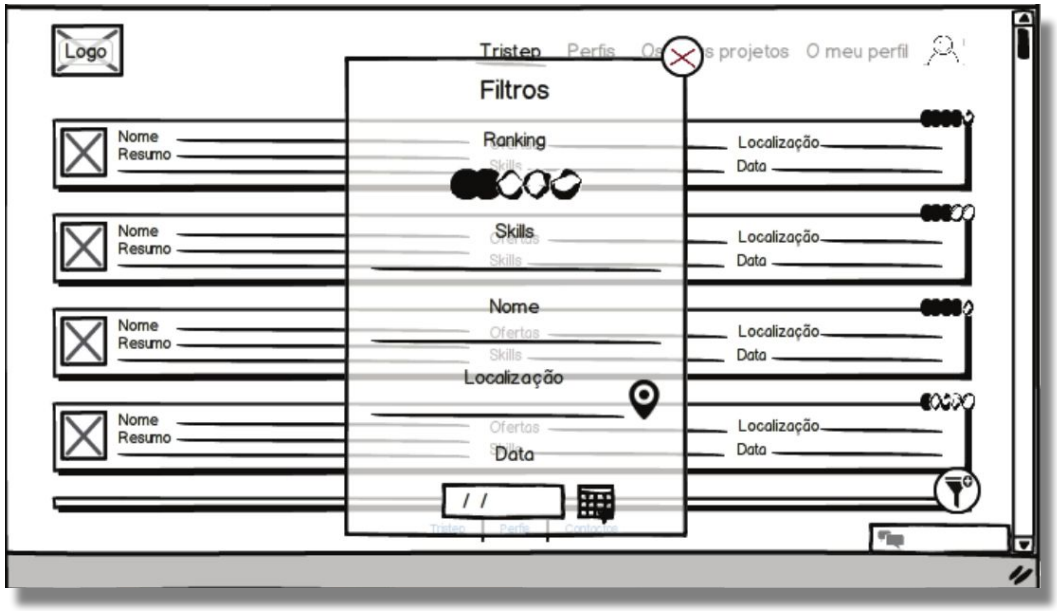
- Iterate over low-cost prototypes
  - Ideate/design
  - Prototype
  - Test/evaluate
  - Repeat



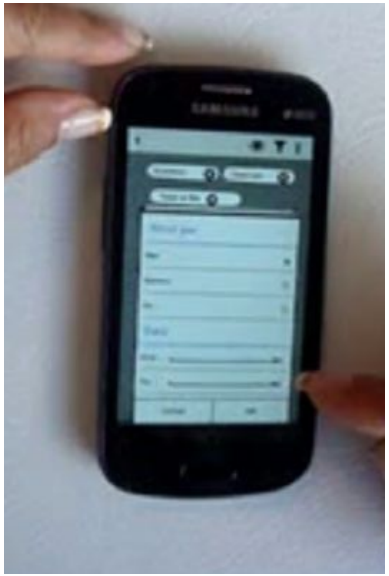
Prototyping



Prototyping



Prototyping



Course Structure

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- **Lectures**
  - 1.5h / week
  - **Discussion** about HCI topics, approaches and techniques

- **Practical classes**
  - 1.5h / week
  - **One project** developed in **three phases**
  - **Groups of three** students of the **same class**
  - Classes start next week, but **work starts today...**

Project

Main Goal

Design of a novel user interface (UI) for a mobile / web app
or other if better suited (propose and let's discuss!)

Groups

3 students from same class

Three Phases

1. User and Task Analysis (4 weeks)
2. First Iteration (4 weeks)
3. Second Iteration (4 weeks)

Topic

Chosen by the groups from a set (coming soon)

Course Evaluation

- Project Grade
  - PG = F1 * 30% + F2 * 30% + F3 * 30% + FP * 10%
    - F1, F2, F3 - Project Phases
    - FP - Final Presentation
- Final Grade
  - FG = PG * 80% + MT * 20%
    - PG - Project grade
    - MT - Mini-Test

Presentations and Reports

- Presentations
  - 10 minutes
  - Submitted the day before the presentation
- Reports
  - After the presentation
  - Can (should!) be refined according to feedback
- Focus on the process!

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Slides by Rui Rodrigues
Partly based on Hugo Nicolau's slides (IST)