

PROTOTYPING

HCI - L.EIC - FEUP - 2025

PROTOTYPING

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- **Users don't know what they want**, but...
 - when faced with something **they can tell what they don't want**
- **Prototype:**
 - **Concrete**, yet **partial representation** of the system
- **Goal:**
 - **Try out ideas**
 - **Reduce time and cost** needed to test a design
 - **Dump bad ideas** early
- **Can focus on:**
 - **UI** -> e.g. hand-drawn screens, Mock-up video
 - **Device** -> e.g. Cardboard model
 - **Functionality** -> Partially-functioning software

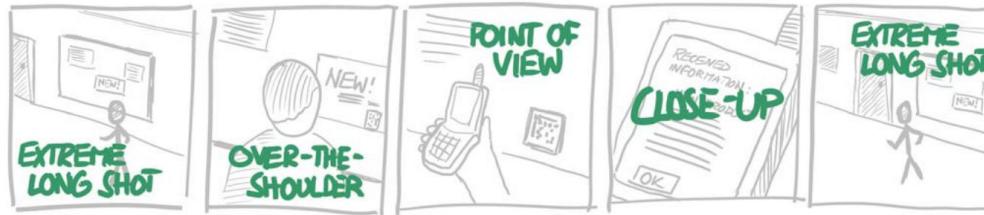
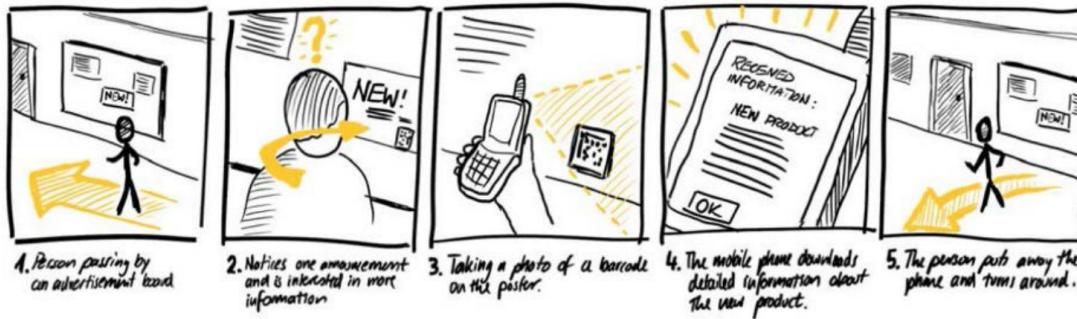
COMMON TECHNIQUES

- Experiential
 - Storyboarding
 - Bodystorming
 - Wizard of Oz
- Low-Fidelity/Functionality prototypes
 - Paper
 - Mock-ups
- Mid/High-fidelity/Functionality prototypes
 - Interactive Mock-ups
 - Functional prototypes

EXPERIENTIAL TECHNIQUES

STORYBOARDS / SKETCHES

- A series of **drawings** that **tell a story**
- Depicts **settings, context** and **sequences of actions/events**
- A mix between comics and movie script

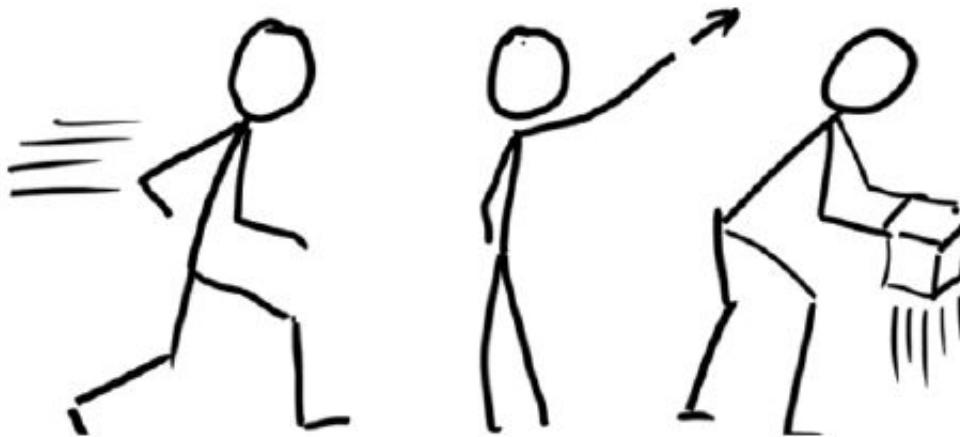


A STORYBOARD COMMUNICATES...

- **Context**
 - People,
 - environment,
 - tasks
- **Sequence**
 - Motivation for goal,
 - steps taken,
 - task details (no UI)
- **Goal**
 - Motivation for using the system,
 - what is achieved,
 - what needs are fulfilled

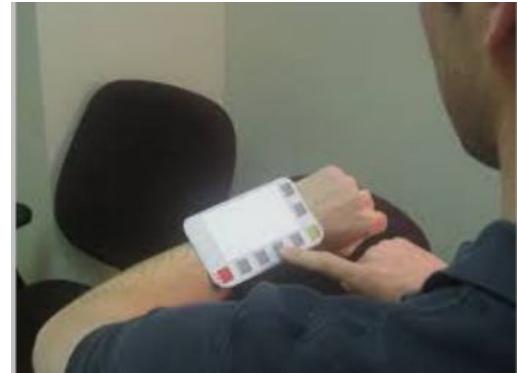
STORYBOARD: IT'S NOT ABOUT THE DRAWINGS

- Drawing skills are not very important
- It is about **communicating the concept**



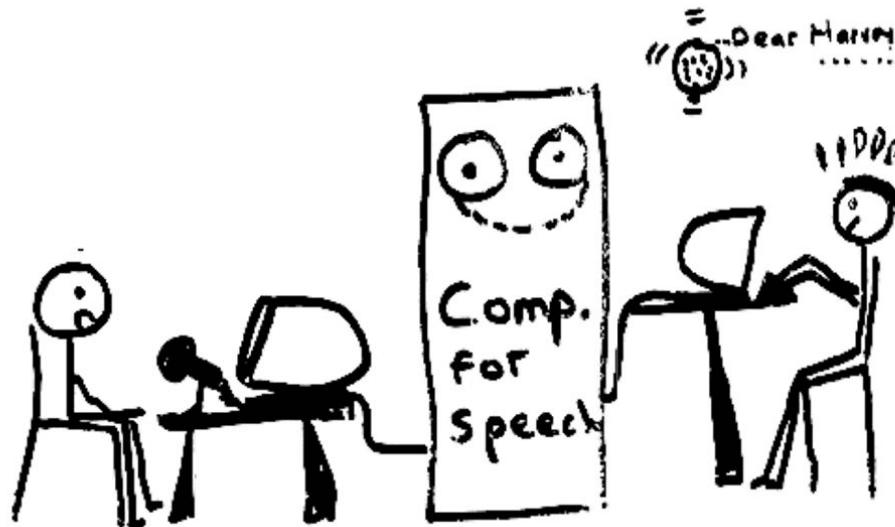
BODYSTORMING

- **Experience physically** a situation
- **Imagine systems in context**
- **Generate ideas** on tasks/functionalities
- **Do role play**
- **Important steps**
 - Choose the place
 - Prepare the space and materials
 - Recruit, test and observe
 - Debriefing with users and observers



WIZARD OF OZ

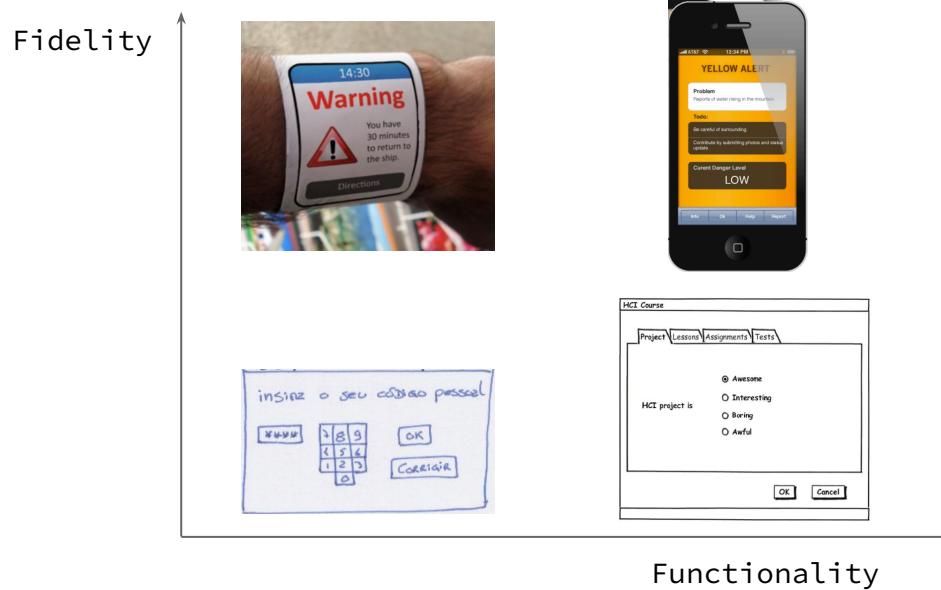
- Functionalities of the system are simulated by a human (hidden or not)
- Useful for early concept testing/simulation of complex or demanding systems (e.g. speech or gesture recognition, AI...)



PROTOTYPES

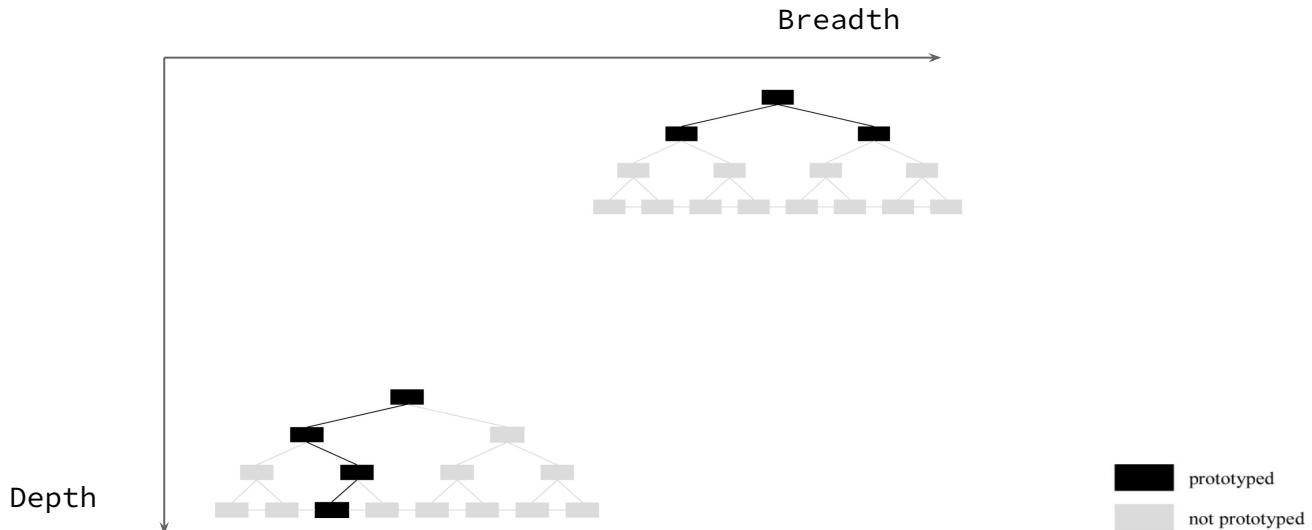
FIDELITY VS FUNCTIONALITY

- **Fidelity** focuses on **appearance**
- **Functionality** focuses on system **response**



HORIZONTAL VS VERTICAL

- **Horizontal** prototypes have a **broad but shallow** coverage of tasks
- **Vertical** prototypes **focus on specific parts in depth** (frontend down to backend)

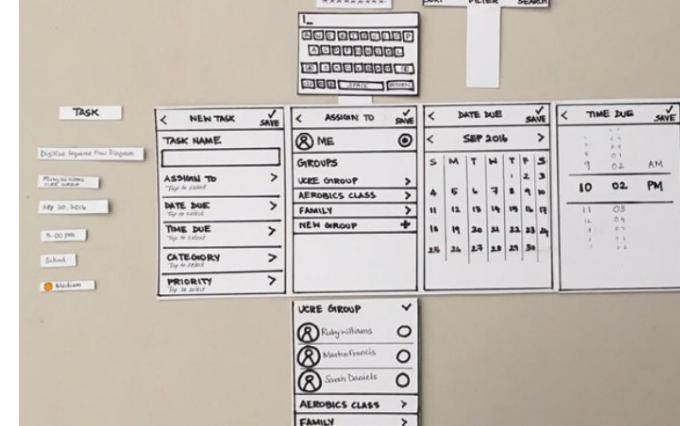


LOW-FIDELITY PROTOTYPES

- **Easy and fast** to create
- **Low-cost** (hand-made or with simple tools, rough)
- Deliberately **focus on the idea**, not on the looks
- Quick user feedback, allows to **easily test ideas**
- **Disposable**: not feeling sorry for **throwing away a bad idea**
- **Cons:**
 - Very high-level
 - Not very scalable

PAPER PROTOTYPES

- Can be built with simple materials and tools
 - Paper, cardboard
 - Glue, tape
 - Markers, pencils
 - Scissors, Cutting knife
 - Molding paste



MOCK-UPS

- **Representations** of the interface in a more **detailed** way
- Usually created with **software**
- Can be **lo-fi** (e.g. **wireframe**) or **hi-fi** (e.g. actual **hi-res widgets**)
- Can be **printed out** to test as paper prototypes, or **used digitally** (desktop, mobile)
- Good for **UI consistency**, more **scalable** than sketching, and still **faster and cheaper than coding**
- **Cons:**
 - Can be slower than sketching for small/initial prototypes
 - Flow has to be induced by the tester
 - If hi-fi too early, can bias the user

INTERACTIVE MOCK-UPS

- Use tools to **add interactivity** to mock-ups
- Can be simple “**hyperlinking**” between screens through clickable/tappable areas
- Can have some **more complex interactions**, but not actually programmed

FUNCTIONAL PROTOTYPES

- Prototypes that already **implement part of the logic** of the functionalities
- Can be in the final platform, or in some rapid prototyping platform
- Usually vertical, but can be horizontal
- **May be lo-fi or hi-fi** (although usually at this point there are already hi-fi mock-ups available)

TOOLS FOR PROTOTYPING

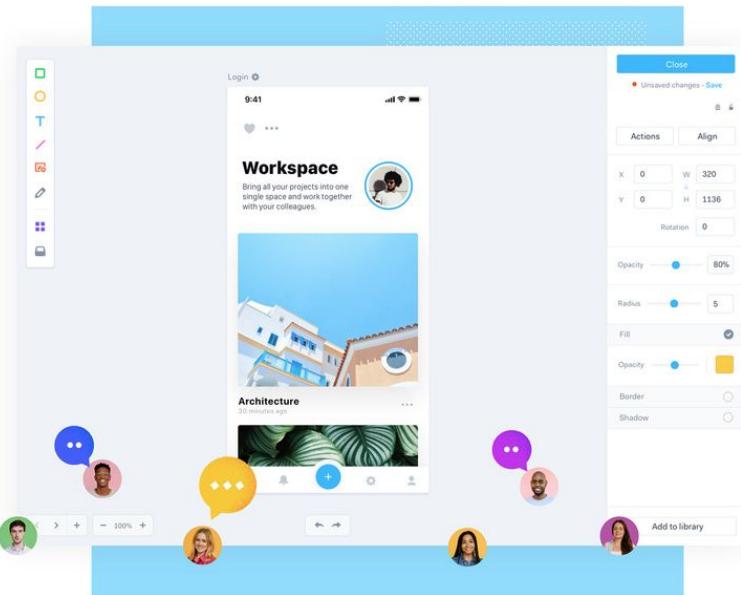
TOOLS FOR PROTOTYPING

- Many exist nowadays
- Different use cases
- Some suggestions follow
- Extended list in Moodle

SIMPLE HYPERLINKING

- **Marvel App**
 - Simple prototypes
 - Create screens importing images (e.g. hand-drawn)
 - Define hotspots in images to create tappable areas that lead to other screens
 - Allows to test directly on mobile

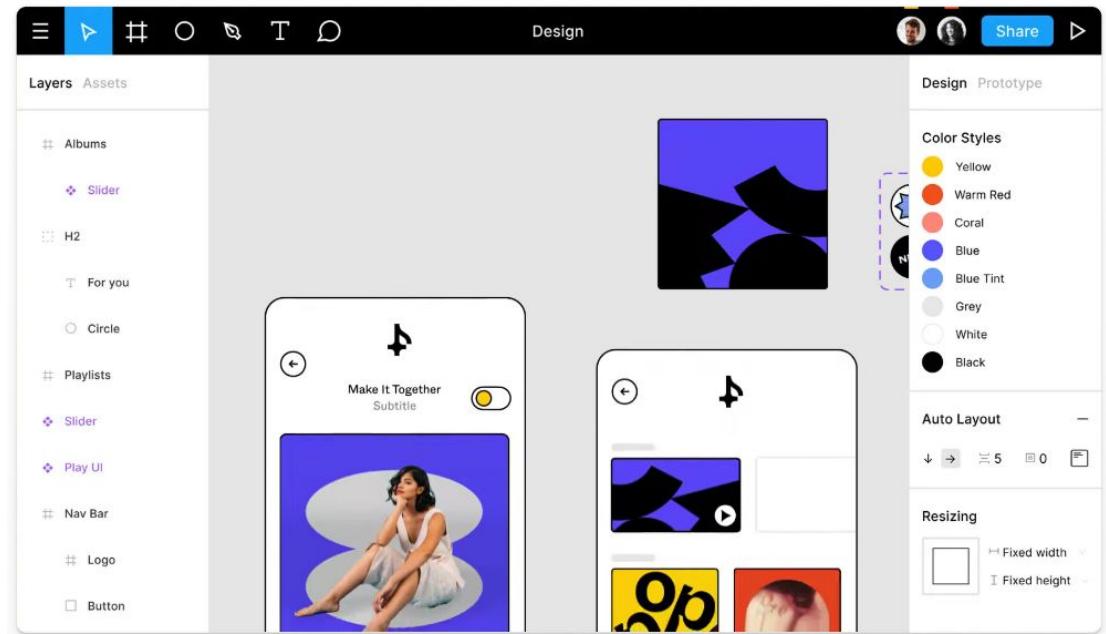
<https://marvelapp.com>



FIGMA

- Allows different interactive flows
- Allows real-time collaboration
- Free for students

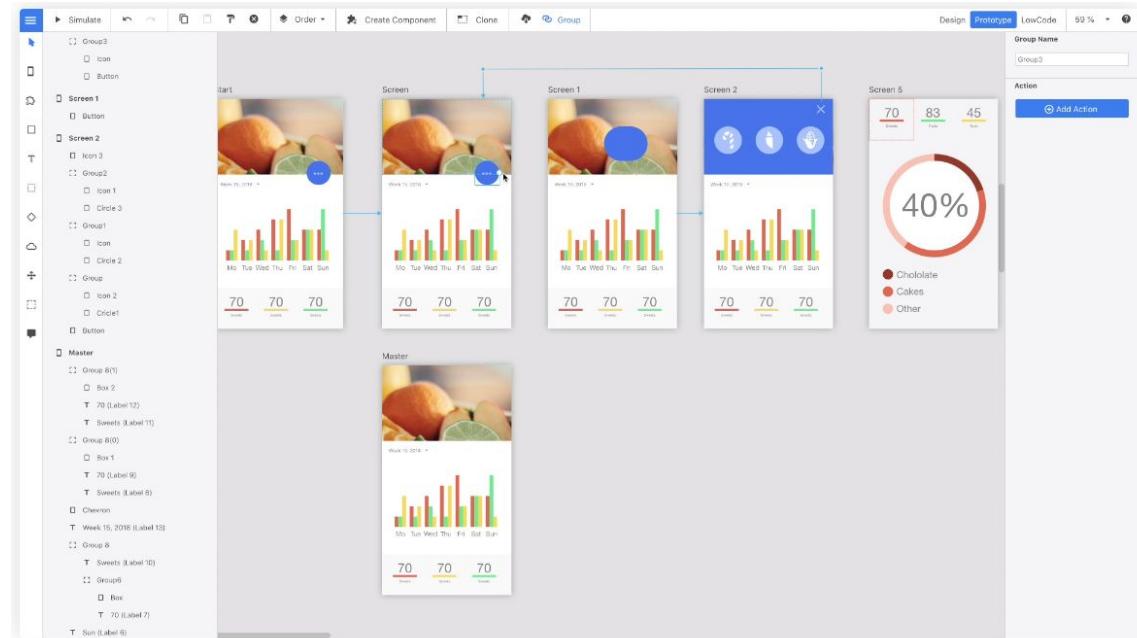
<https://figma.com>



QUANT-UX

- Advanced set of widgets and functionalities
- Tools for testing
- Free and open Source

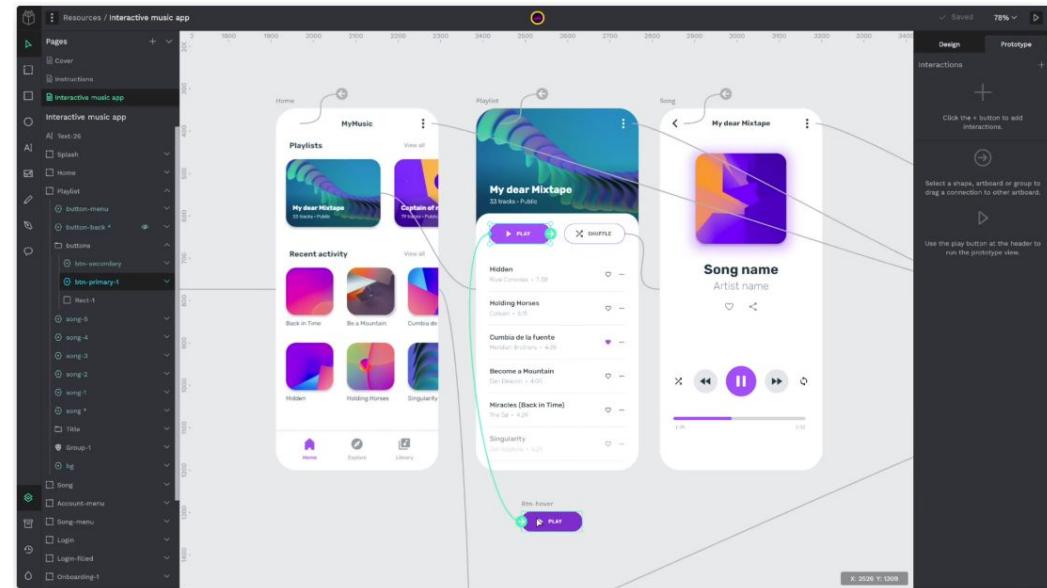
<https://quant-ux.com/>



PENPOT

- Allows different interactive flows
- Allows real-time collaboration
- Recent, but promising
- Free, Open Source

<https://penpot.app>



FAMOUS ONES

- Commercial, with free versions sufficiently capable
 - **Webflow** <https://webflow.com>
 - **Just in Mind** <https://www.justinmind.com/>
 - **InVision/Freehand** <https://www.freehandapp.com>
- Extended list in Moodle

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Additional credits: Hugo Nicolau (IST), Teresa Galvão (FEUP)