

Design, prototyping and construction



Overview

- Prototyping and construction
- Conceptual design
- Physical design
- Generating prototypes
- Tool support



Prototyping and construction

- What is a prototype?
- Why prototype?
- Different kinds of prototyping
 - low fidelity
 - high fidelity
- Compromises in prototyping
 - vertical
 - horizontal
- Construction

What is a prototype?

A prototype is one **manifestation** of a design that allows **stakeholders** to interact with it and to explore its **suitability**.

In interaction design it can be (among other things):

- a series of screen sketches
- a storyboard, i.e. a cartoon-like series of scenes
- a Powerpoint slide show
- a video simulating the use of a system
- a lump of wood (e.g. PalmPilot)
- a cardboard mock-up
- a piece of software with limited functionality written in the target language or in another language

Why prototype?

- Evaluation and feedback are central to interaction design
- Stakeholders can see, hold, interact with a prototype more easily than a document or a drawing
- Team members can communicate effectively
- You can test out ideas for yourself
- It encourages reflection: very important aspect of design
- Prototypes answer questions, and support designers in choosing between alternatives

Prototyping: PalmPilot



Prototyping: PalmPilot

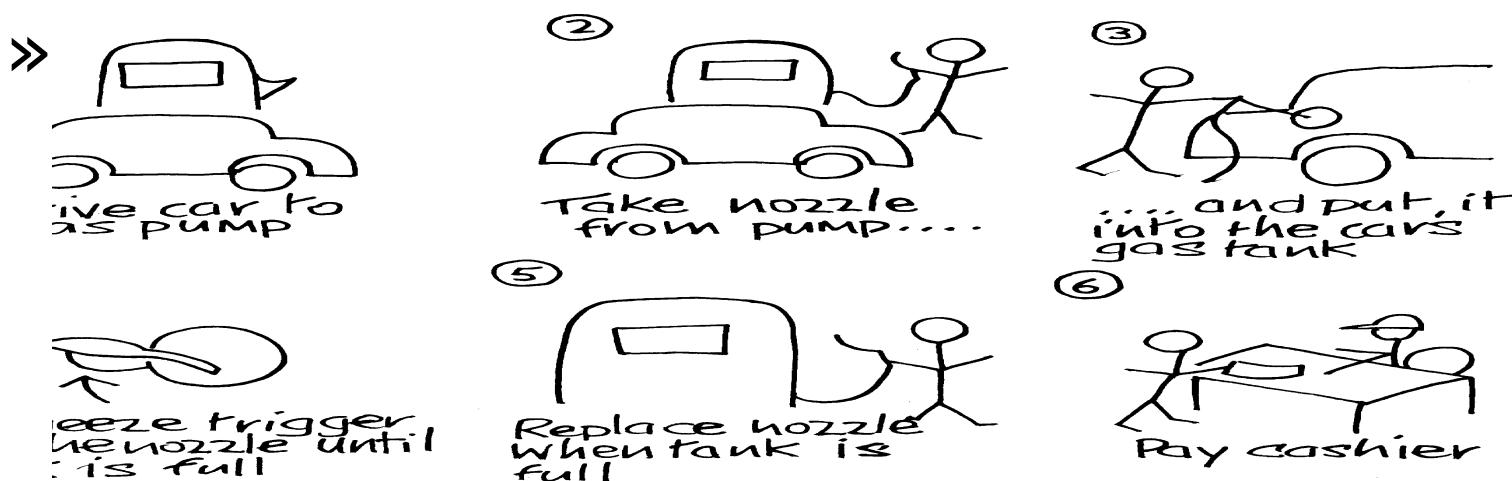


Low-fidelity Prototyping

- Does not look very much like the initial product and does not provide the same **functionality!**
- Low-fidelity prototypes are useful because they tend to be **simple**, **cheap**, and quick to produce and **modify**.
- Examples:
 - storyboards
 - Sketching
 - Card-based prototypes
 - 'Wizard-of-Oz'

Storyboards

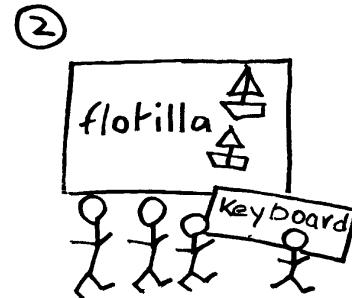
- Often used with scenarios, bringing more detail, and a chance to **role play**
- It is a series of sketches showing how a user might progress through a task using the device
- Used **early** in design



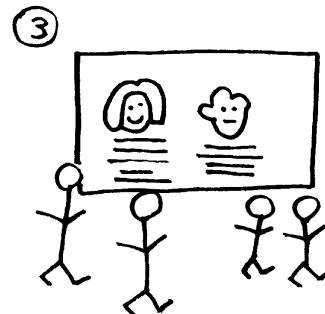
Generate storyboard from scenario



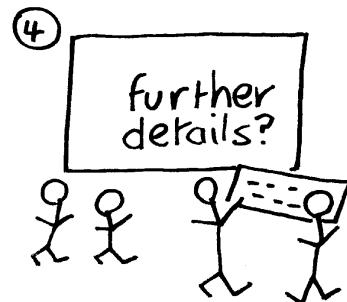
Thomson family
gather around



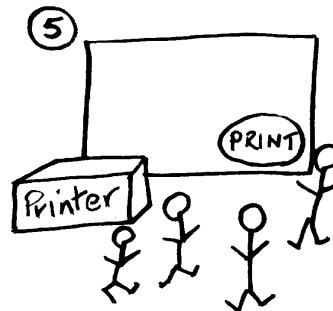
System suggests
flotilla



System shows
descriptions



System asks
for details



Summary printed

Sketching

- Sketching is important to low-fidelity prototyping
- Don't be inhibited about drawing ability. Practice simple symbols
 - » Layout not details.



Card-based prototypes

- Index cards (3 X 5 inches)
- Each card represents one screen or part of screen
- Often used in
 - website development
 - Setup process
 - Log in process
 - Sign up process
 - Confirm transaction

Travel
Organiser

23 August 2006

WELCOME HELEN

Where do you want to go?
What date do you want to travel?
Which form of transport do you want?
Do you need accommodation?

TRAIN
 YES

Travel
Organiser

23 August 2006

Train timetable from Milton Keynes Central
to York
on 16.09.06

Depart 09:09 10:09 same 22:09
Arrive 12:30 13:30 past 01:30

Accommodation Hotel B & B
£40 to £150 £20 to £60

Generate card-based prototype from use case

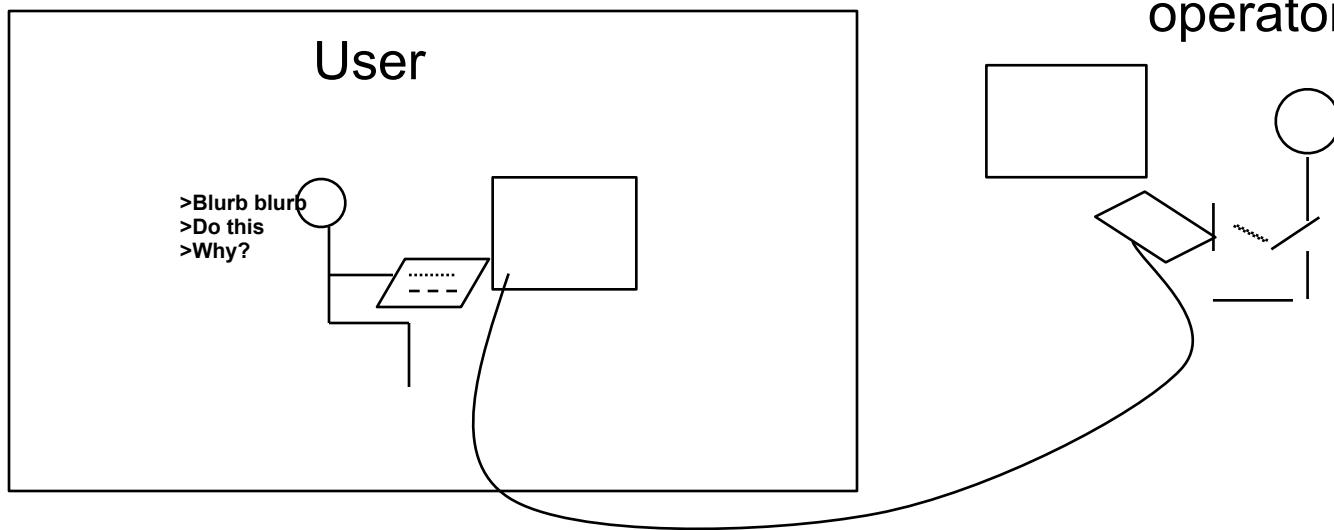
TRAVEL INFORMATION
Visa requirements
Vaccination Recommendations
What to pack before you go

VISA REQUIREMENTS	
Destination Country	<input type="checkbox"/>
Traveller's Nationality	<input type="checkbox"/>

VISA REQUIREMENTS FOR (COUNTRY)

'Wizard-of-Oz' prototyping

- The user thinks they are interacting with a computer, but a developer is responding to output rather than the system.
- Usually done early in design to understand users' expectations
- What is 'wrong' with this approach?



High-fidelity prototyping

- Uses materials that you would expect to be in the final product.
- Prototype looks more like the final system than a low-fidelity version.
- For a high-fidelity software prototype common environments include Macromedia Director, Visual Basic, and Smalltalk.

High-fidelity prototyping

- » **Dangers:**
 - » Prototype can appear to users to be the final product
 - » Developers may consider fewer alternatives because the prototype works and users like it
 - » Developers may be in rush and uses some of the prototype in the final product

Compromises in prototyping

- All prototypes involve **compromises**
- For software-based prototyping maybe there is a slow response? sketchy icons? limited functionality?
- Two common types of compromise
 - '**horizontal**': provide a wide range of functions, but with little detail
 - '**vertical**': provide a lot of detail for only a few functions
- Compromises in prototypes mustn't be ignored.

Prototyping

- » **Evolutionary** Prototyping

- » A prototype evolves into the final product
- » The prototypes should be subjected to rigorous testing along the way

- » **Throwaway** Prototyping

- » Uses the prototypes as stepping stones towards the final design
- » Testing is not necessary as we trash the prototype!

Example:
SITU



SITU



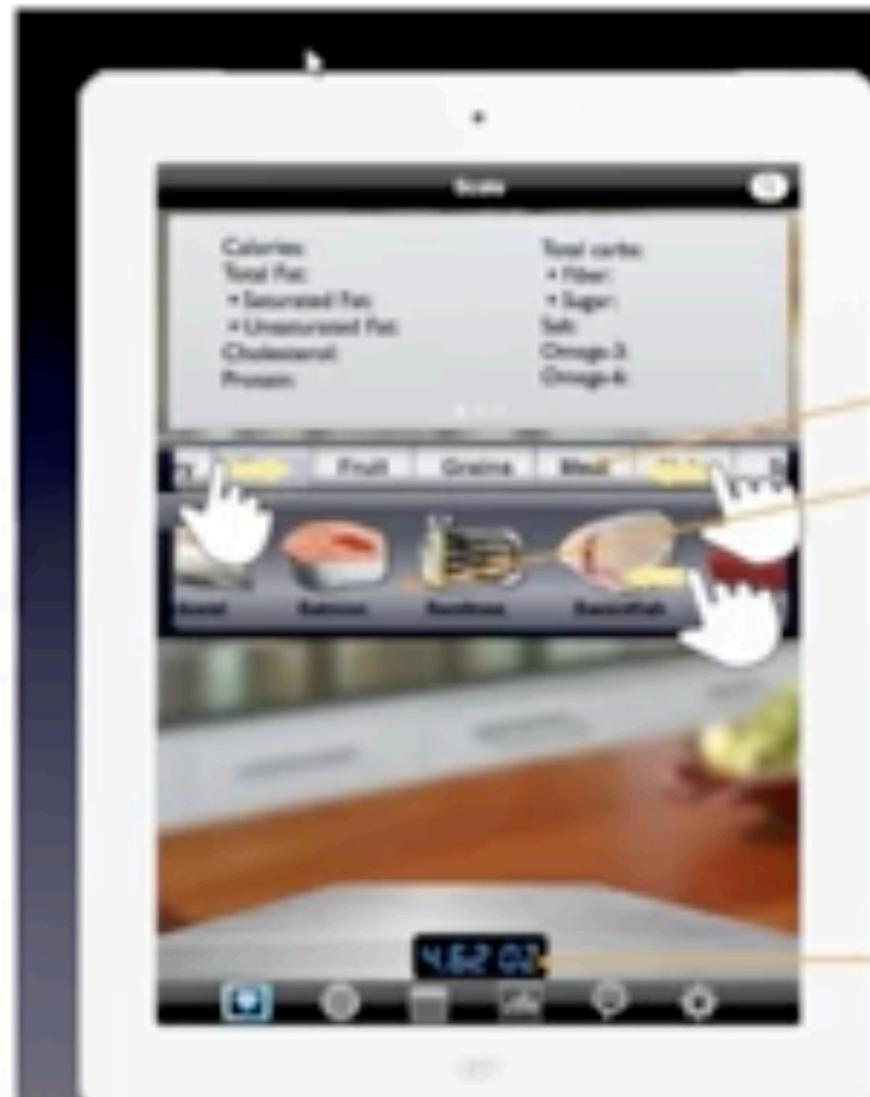
Example: **SITU**

A screenshot of a mobile application for tracking food intake. The top navigation bar is blue with icons for profile, search, and settings. Below the bar, there's a large orange thermometer icon labeled 'Calories' on the left. To its right is a white rectangular box containing nutritional information for a meal. The box has four columns: 'CALORIES' (1200), 'PROTEIN' (22g), 'TOTAL CARBS' (100g), and 'FAT' (12g). Under each column are detailed breakdowns: 'TOTAL FAT' (8.7g), 'SATURATED FAT' (0.4g), 'UNSATURATED FAT' (0.4g), 'CHOLESTEROL' (0mg), and 'PROTEIN' (22g). Below this box is a large, semi-transparent image of a plate containing a slice of watermelon, a piece of salmon, and some green beans. At the bottom of the screen are three buttons: 'Clear Plate' (with a trash bin icon), 'Save Plate' (with a checkmark icon), and 'My Plate' (with a heart icon).

Example: SITU



Example: SITU



Scale "home" screen.

How it works:

2. The user scrolls through and selects the primary category of what they are weighing.
3. They then select the food they are weighing.

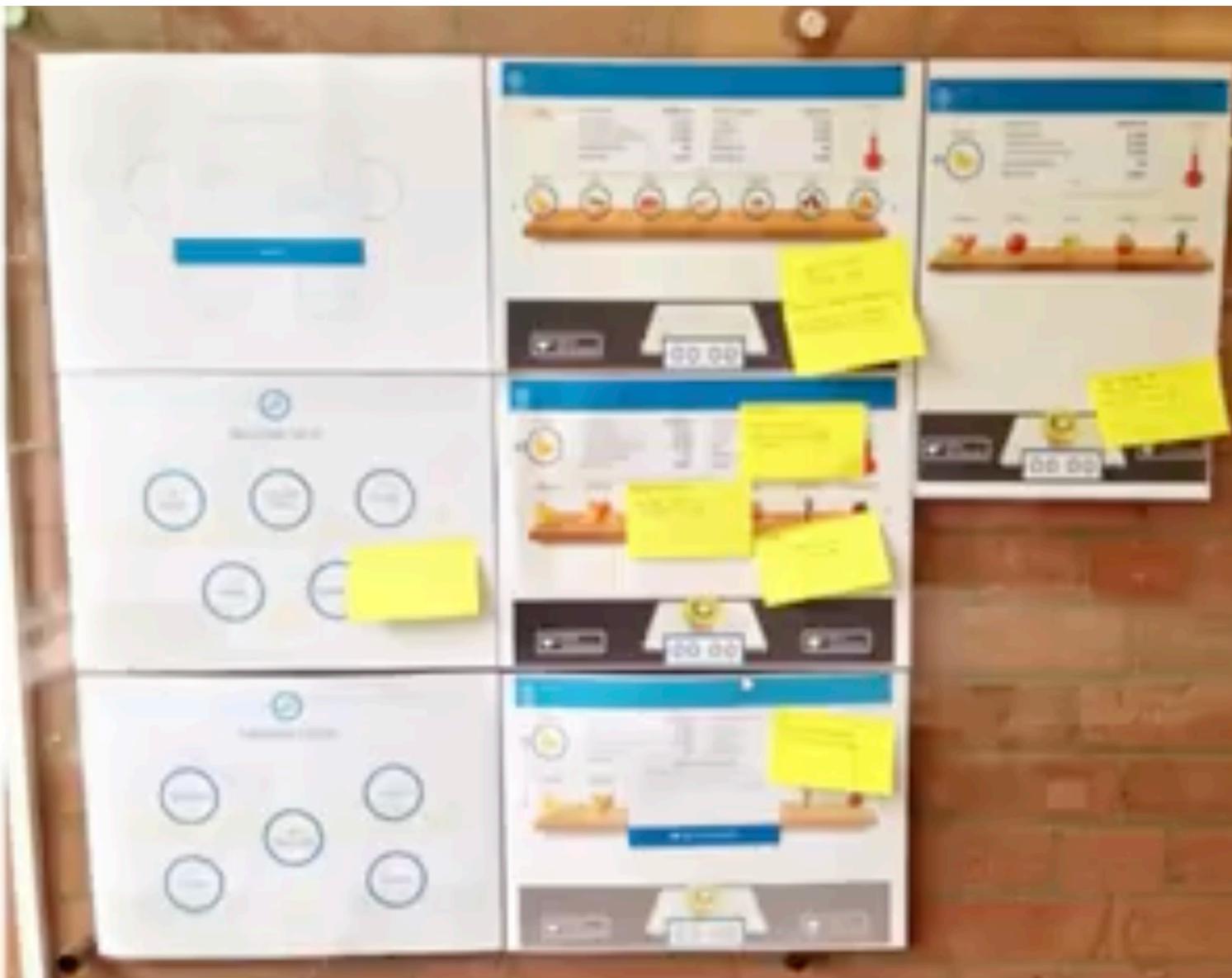


1. The live weight reading from the Wi-Fi scale is displayed.

Example: SITU



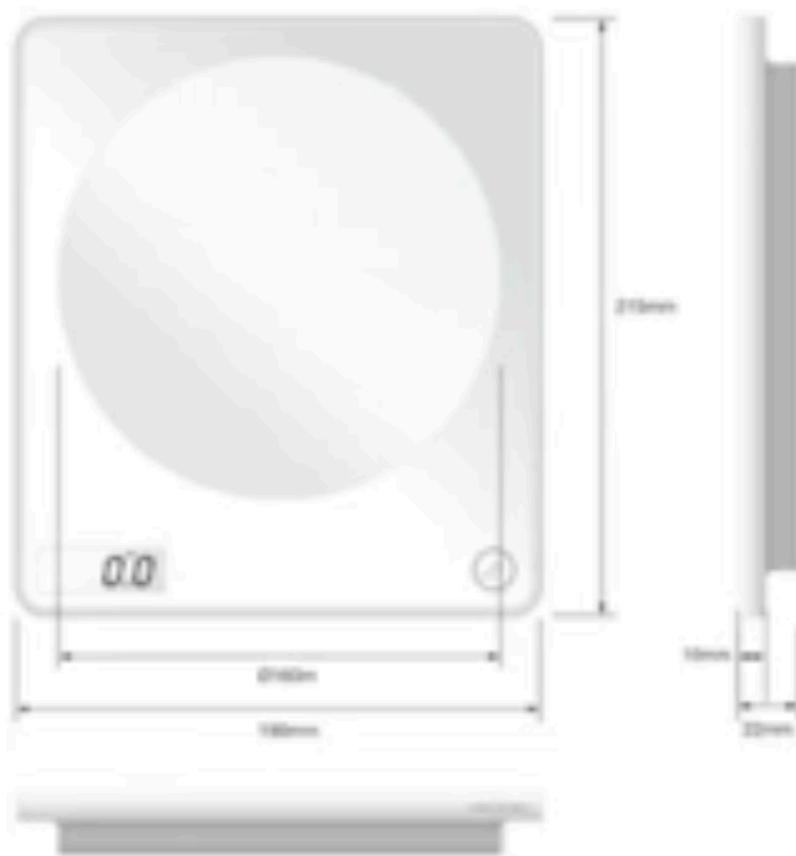
Example: SITU



Example: SITU

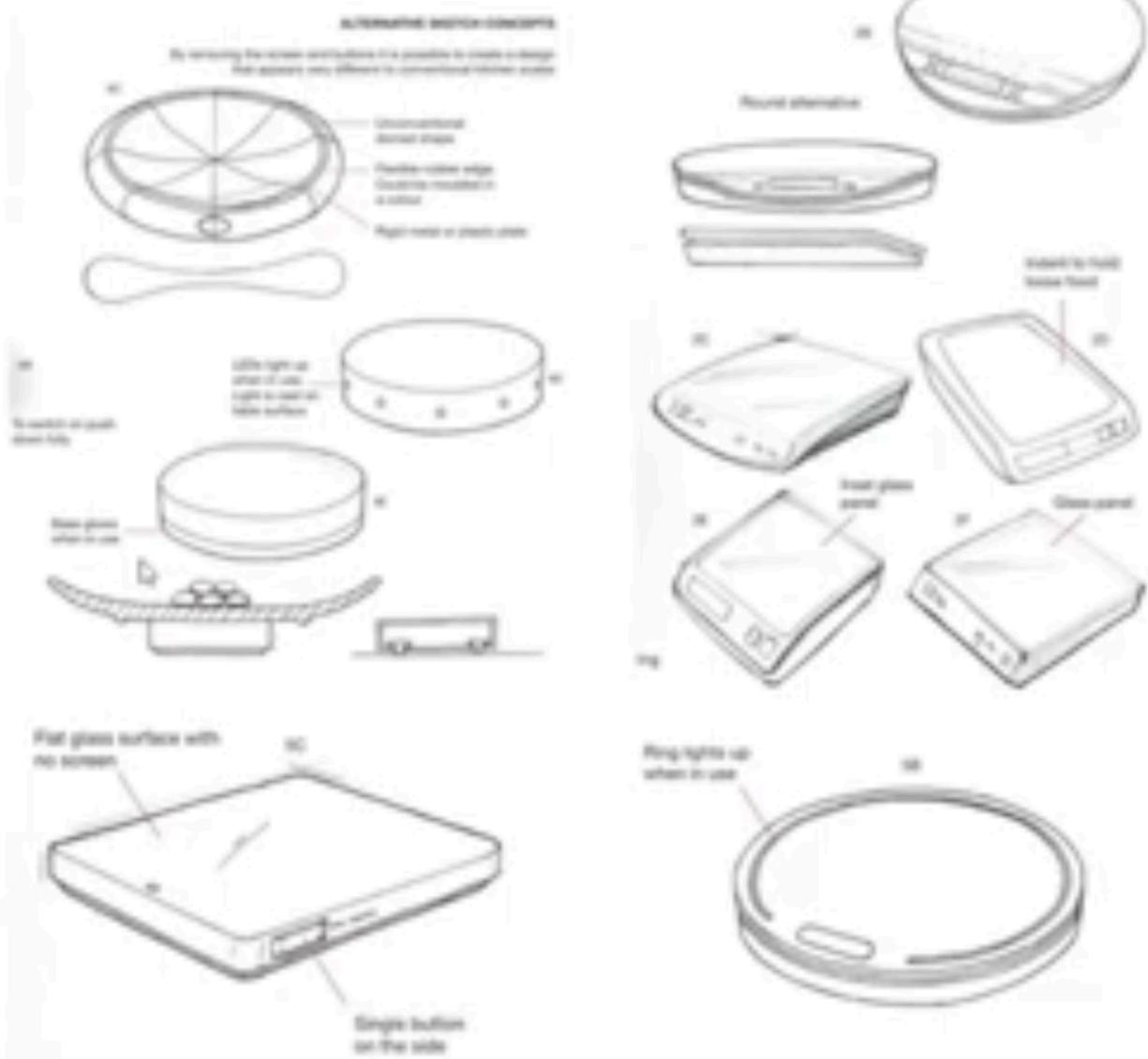


Example: **SITU**



Elevation

Example: SITU



Example:
SITU



Example:
SITU



Example:
SITU



Summary

- Different kinds of prototyping are used for different purposes and at different stages
- Prototypes answer questions, so prototype appropriately
- Construction: the final product must be engineered appropriately
- Conceptual design (the first step of design)
- Consider interaction types and interface types to prompt creativity
- Storyboards can be generated from scenarios
- Card-based prototypes can be generated from use cases