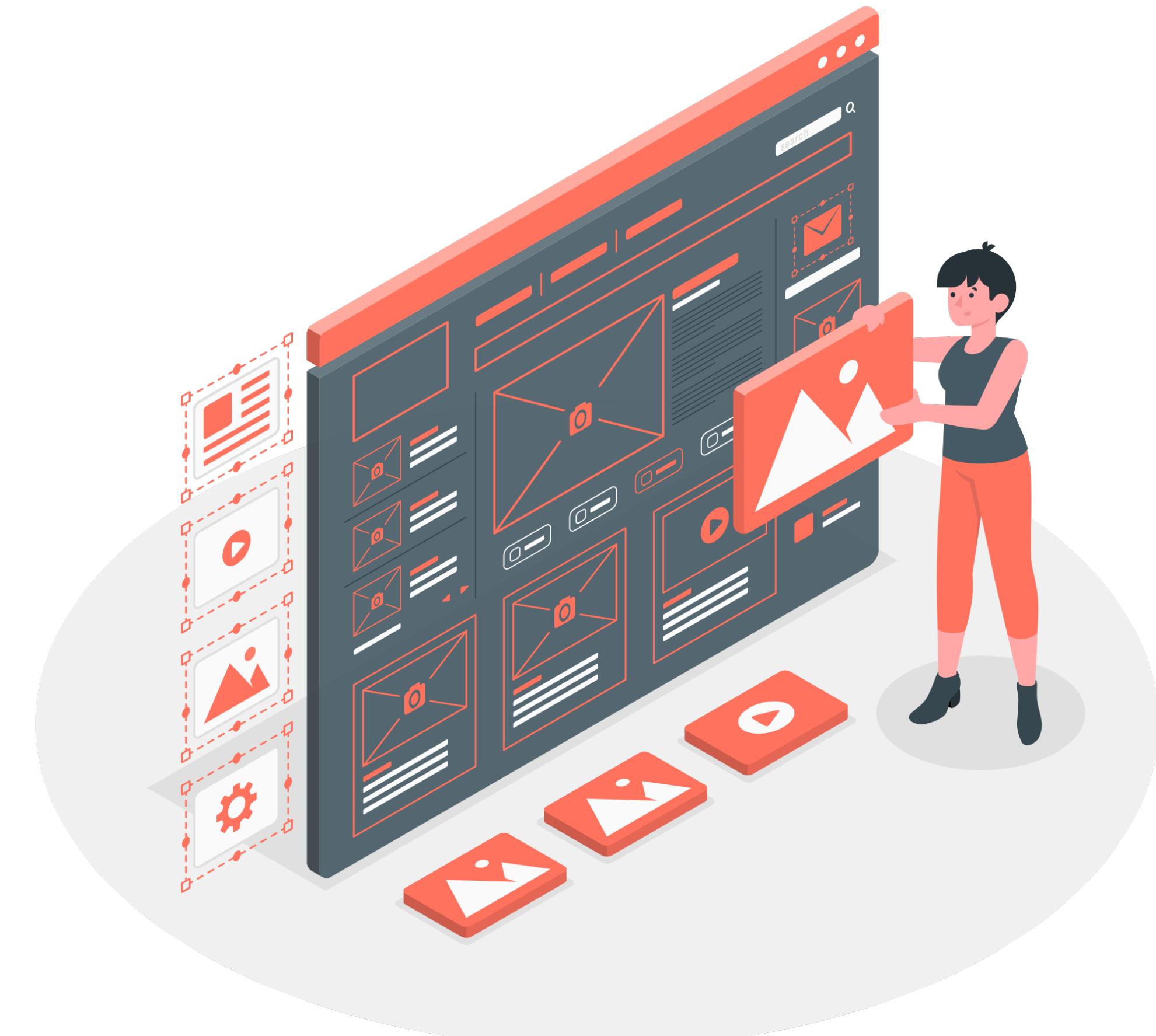


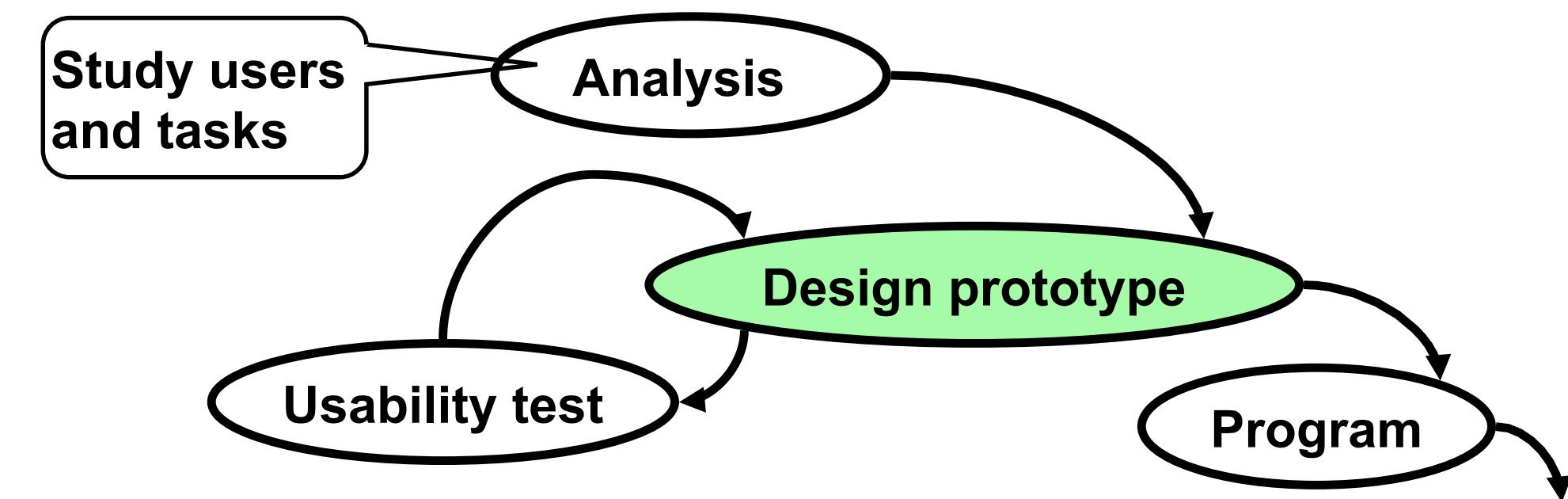
Prototyping

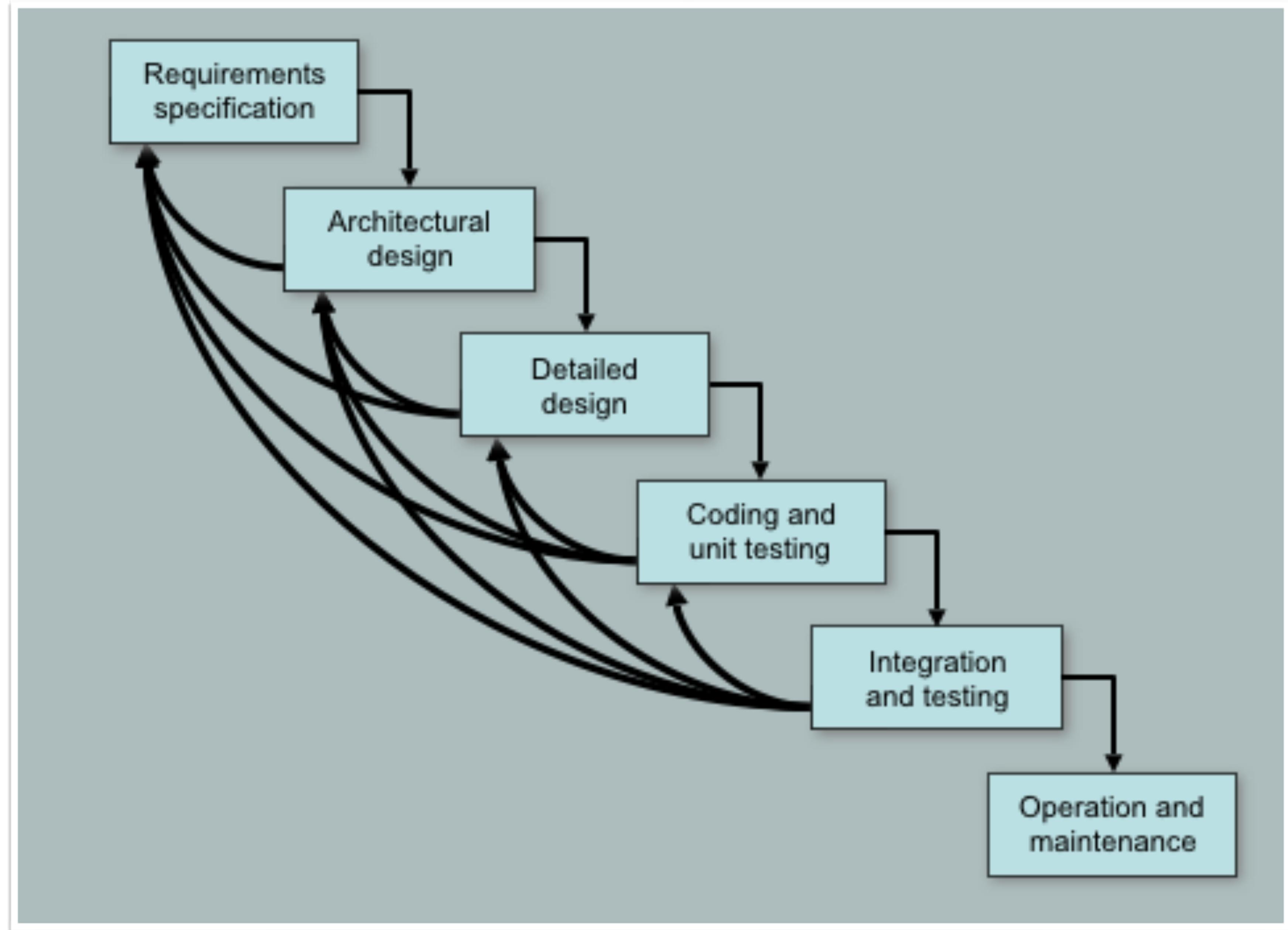
Chapter 7



Prototyping & Iterative Design

- Iterative design overcomes inherent problems of incomplete requirements
- Different types of prototypes
 - throw-away
 - incremental
 - evolutionary
- A prototype is a primitive version of a system



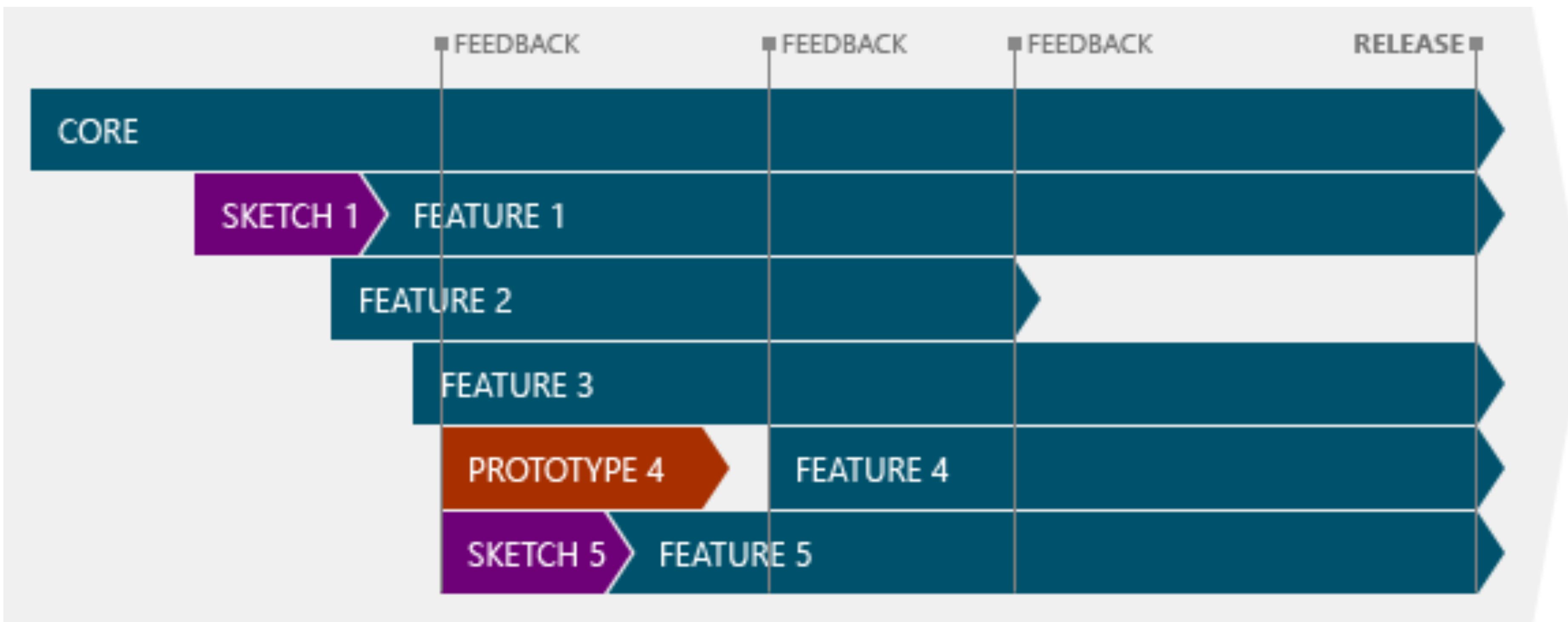


Iteractive Design

Prototyping & Iterative Design

Throw-away prototype

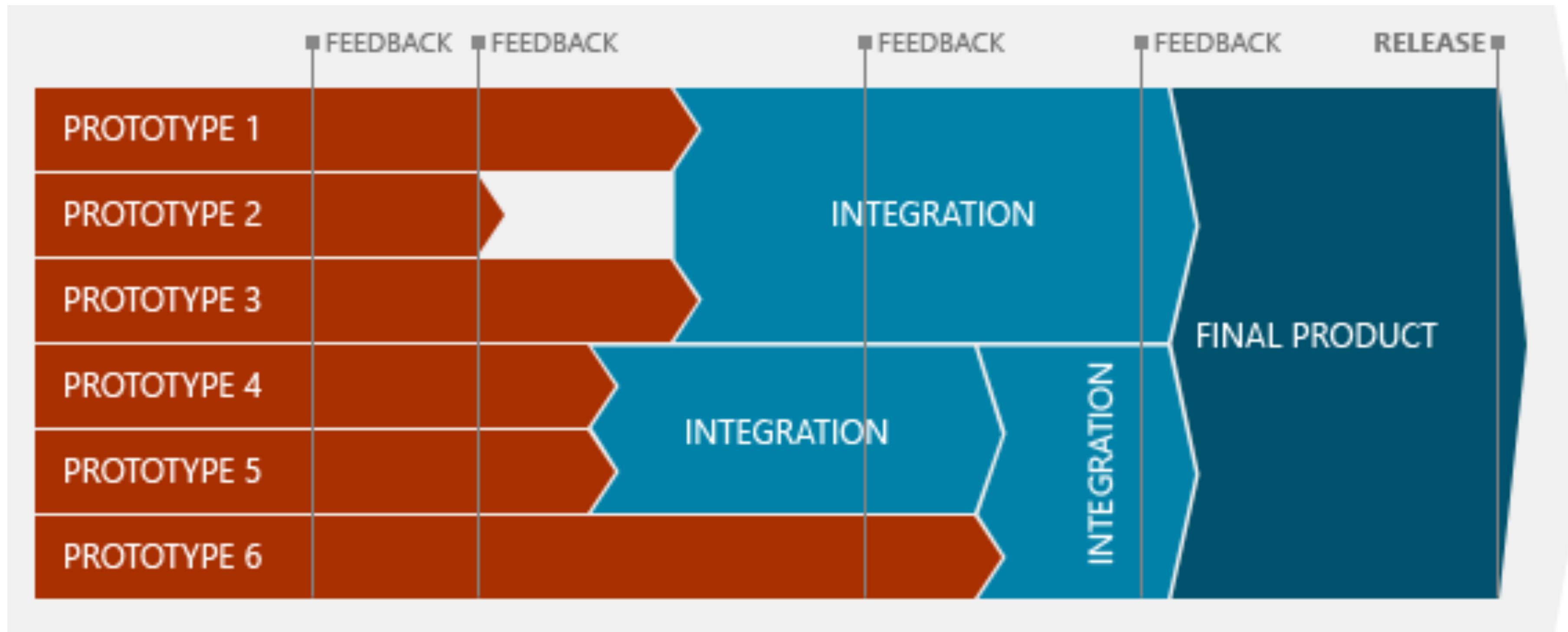
Throw-away The prototype is built and tested. The design knowledge gained from this exercise is used to build the final product, but the actual prototype is discarded.



Prototyping & Iterative Design

Incremental prototype

- The final product is built as separate components, one at a time.
- There is one overall design for the final system, but it is partitioned into independent and smaller components.
- The final product is then released as a series of products, each subsequent release including one more component.

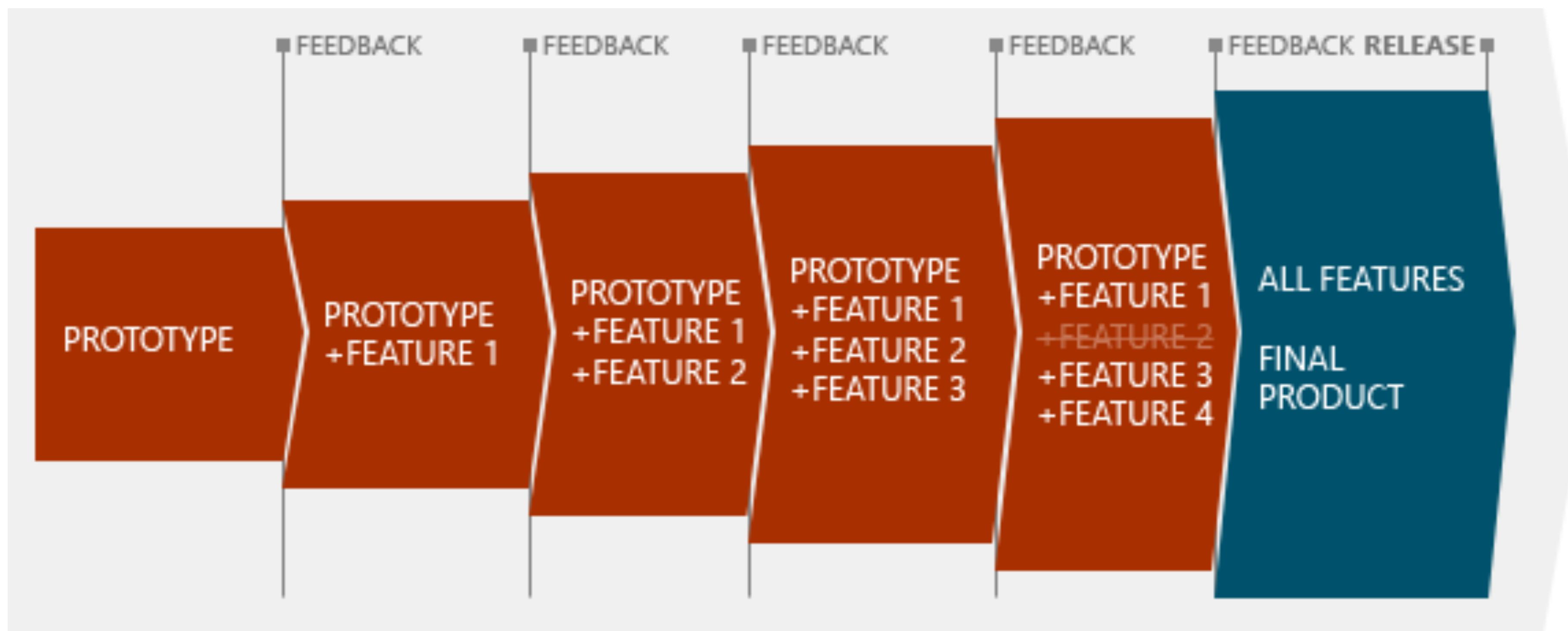


Incremental prototyping consists of building several prototypes, each one representing a part of the future system, and then combine them.

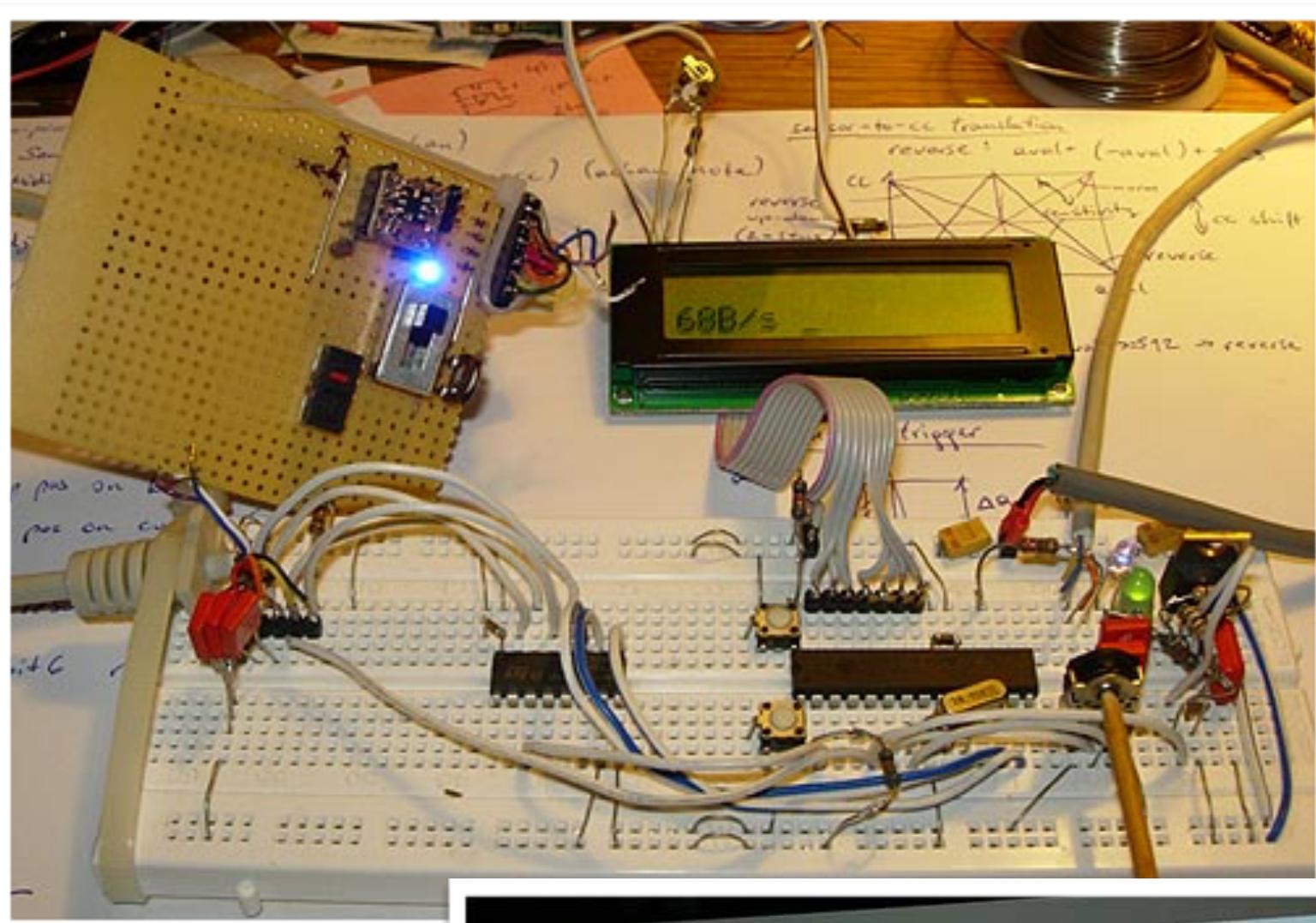
Prototyping & Iterative Design

Evolutionary prototype

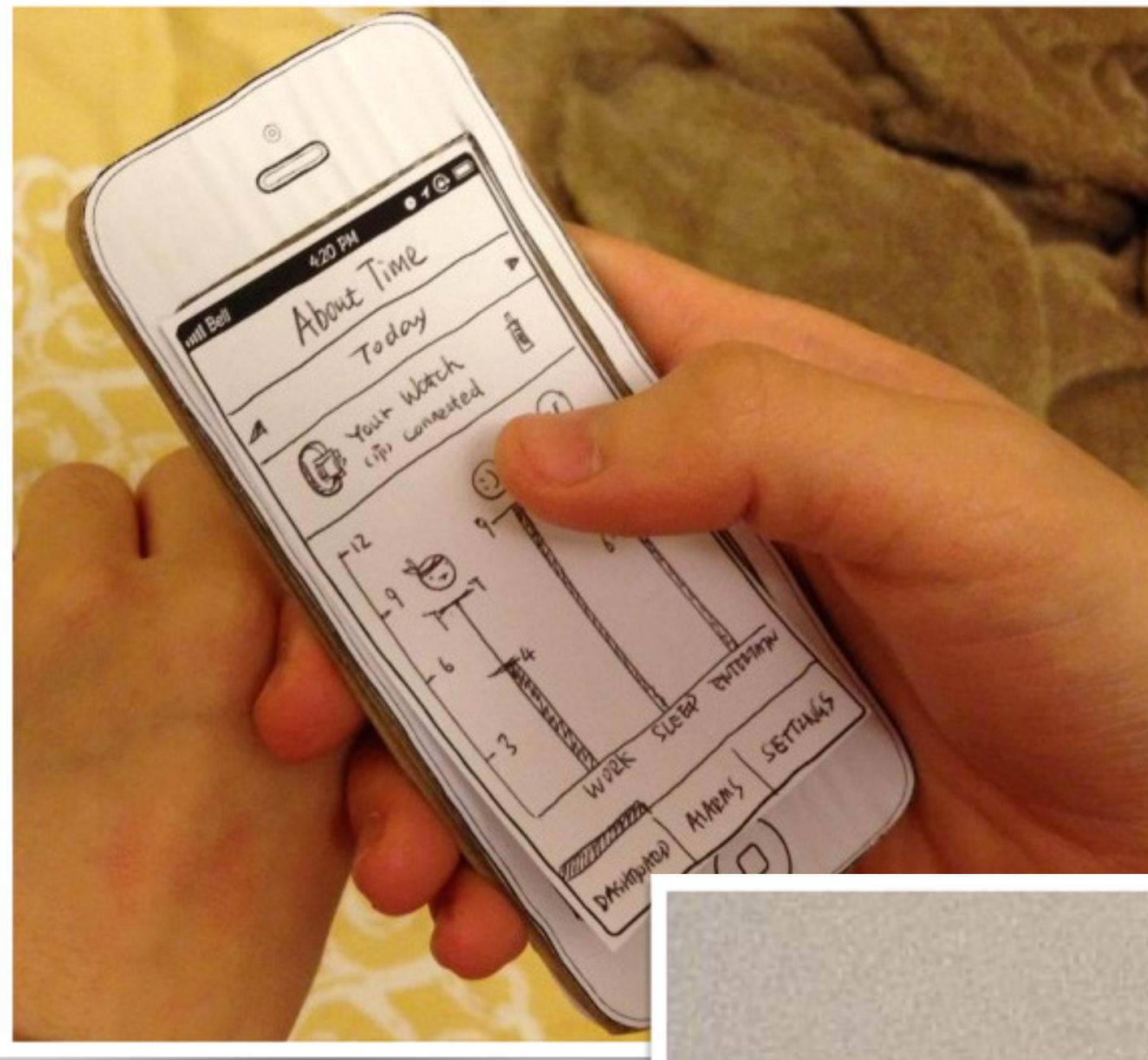
- Evolutionary prototype is not discarded and serves as the basis for the next iteration of design.
- In this case, the actual system is seen as evolving from a very limited initial version to its final release.



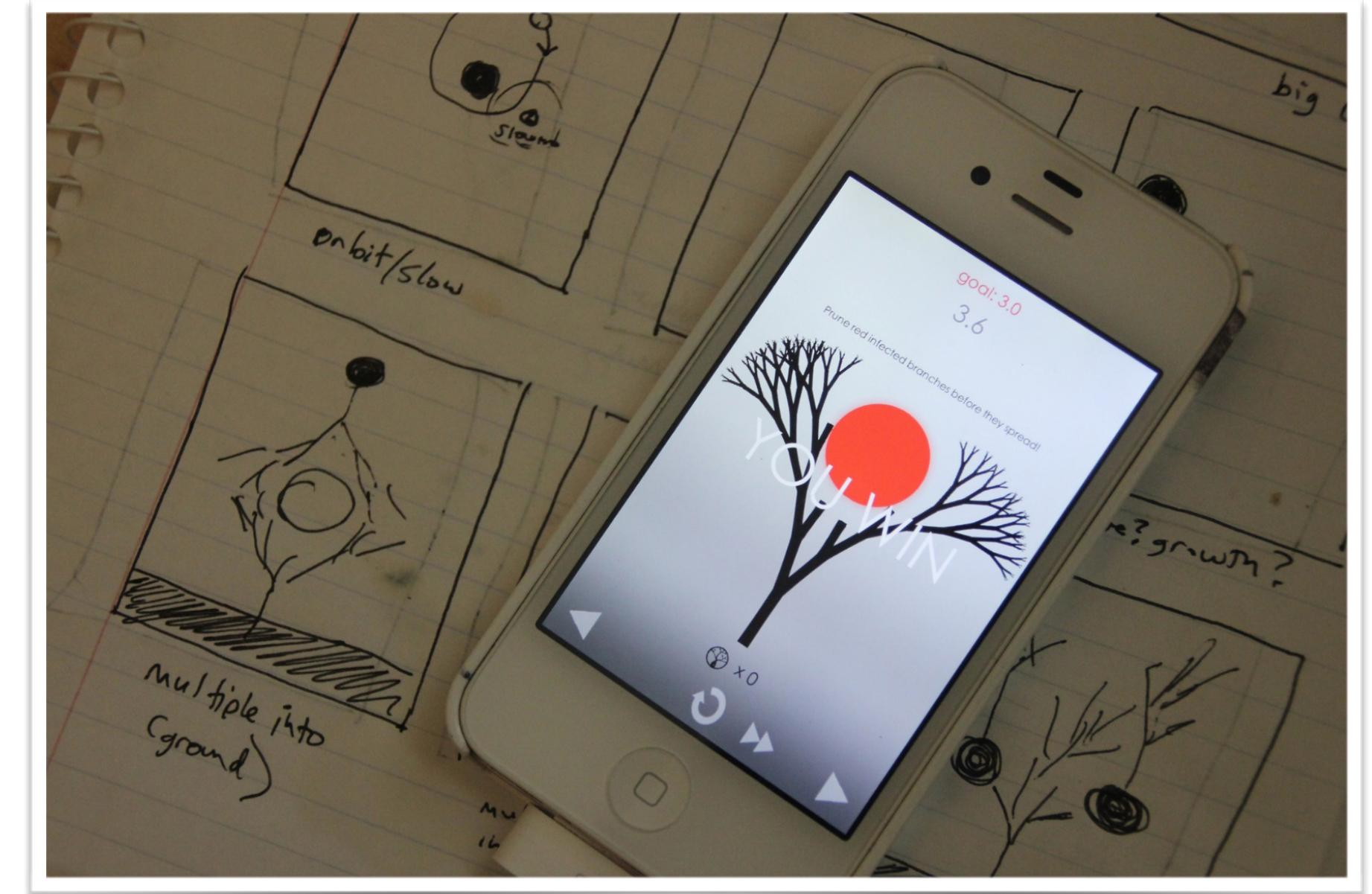
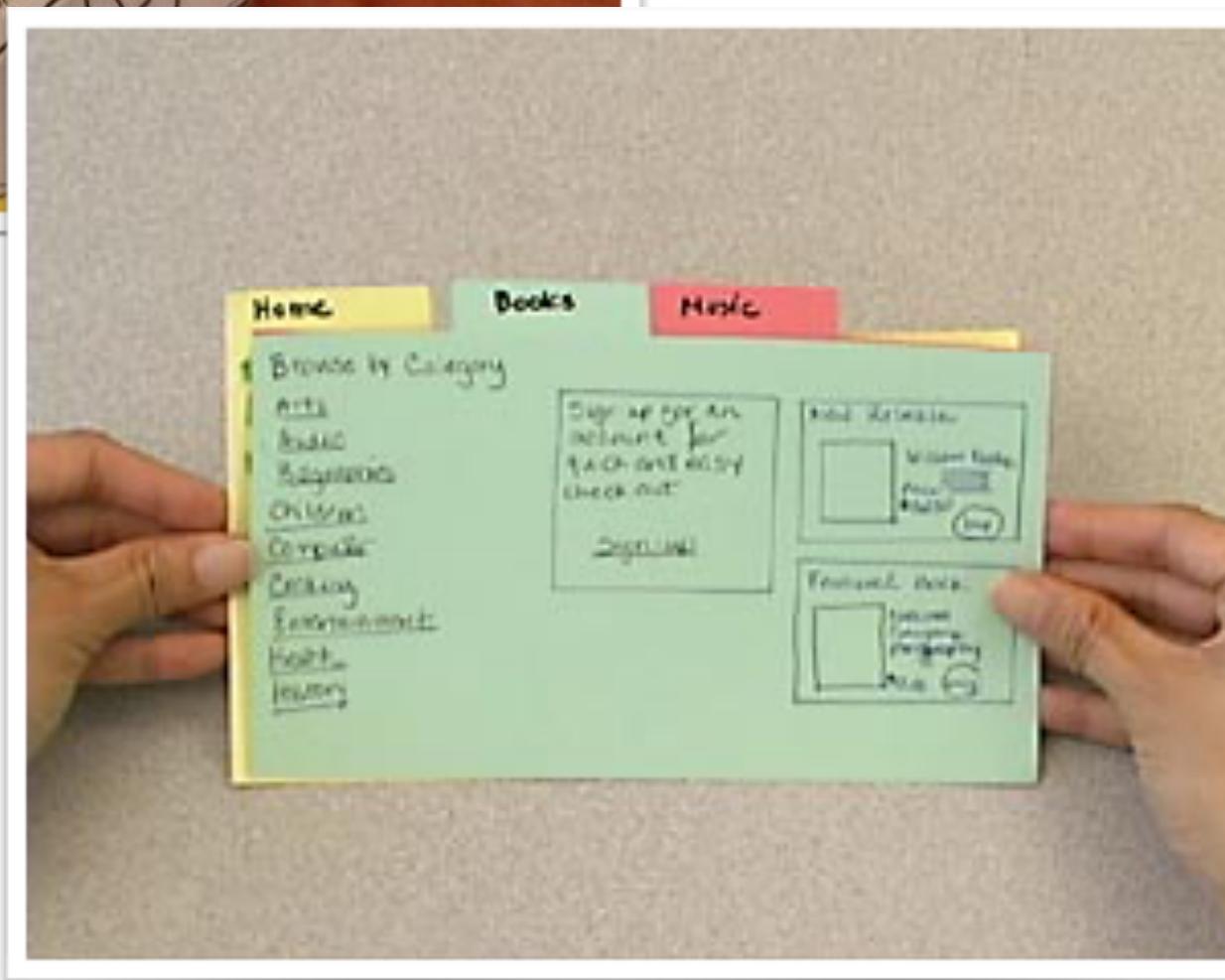
Prototype



Prototype in HCI



mockup



video simulating the system

Why prototype?

- Evaluation and feedback.
- Stakeholders can see, hold, interact with a prototype
- Team members can communicate effectively
- You can test out ideas for yourself
- Examining the structure of a design.
- Prototypes answer questions, and support designers in choosing between alternatives

Prototype

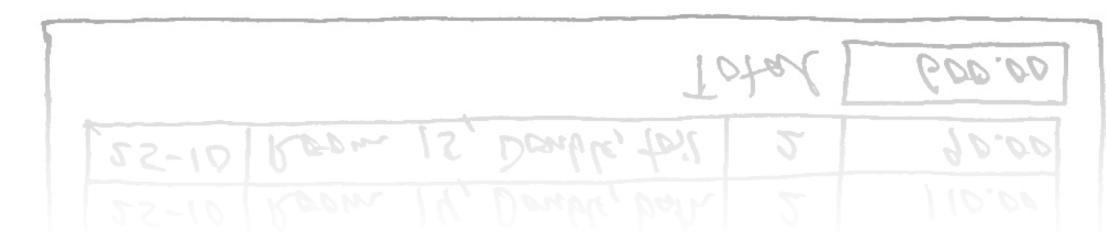
- Prototyping is a design technique where users can be involved in testing design ideas by using experimental, incomplete designs known as prototypes.
- Some examples of prototypes:
 - **Hand-drawn** prototype
 - **Tool-drawn** prototype
 - **Screen** prototype
 - **Functional** prototype

Hand-Drawn Prototype:

- Designer draws the screens by hand using **paper & pencil**
- The user “**enter data**” by writing in the fields with a pencil and the user also uses the pencil to “click” on buttons and menus
- The designer “replies” on behalf of the computer by writing results on the screen

The image shows a hand-drawn prototype of a computer application window titled "Stay". The window has a menu bar with "File" and "Edit" options. Below the menu, there are input fields for "Name" (Andrew Bunting), "Address" (50 Buffalo Drive, Lalon, Vict 3075 Australia), "Phone" ((03) 1533 1217), and "Stay# (727)". There are also dropdown menus for "Pay method" and "Passport". At the bottom, there is a table showing a bill with columns for Date, Item, #Persons, and Amount. The total amount is listed as 600.00.

Date	Item	#Persons	Amount
23-10	Room 14, Double, bath	2	110.00
23-10	Room 15, Double, toilet	2	90.00
24-10	Room 14, Double, bath	2	110.00
24-10	Room 15, Double, toilet	2	90.00
25-10	Room 14, Double, bath	2	110.00
25-10	Room 15, Double, toilet	2	90.00
	Total		600.00



Tool-Drawn Prototype:

- The designer draws the screens on the computer using the same tool that will be used in the final product
- The **Software tool** might be: MS Access, Visual Basic, etc
- The designer prints the screens and uses them in the same way as a hand-drawn prototype
- Advantage: Look more real than the hand-drawn prototype

The image shows a hand-drawn prototype of a software application window titled "Stay". The window has a title bar with the title "Stay" and a stay number "728". Inside the window, there are several text input fields and dropdown menus. The "Name" field contains "John Simpson", the "Address" field contains "456 Orange Grove Victoria 3745 AU", and the "Pay form" dropdown menu shows "Visa". There is also a "Passport" field containing "A102103512". Below these fields is a tabbed panel with "Nights" selected, followed by a "Services" tab. At the bottom of the window is a hand-drawn table with columns for "Room", "# Pers", and "Price". The table contains three rows of data:

Room	# Pers	Price
07-08-98 12, Sgl	1	80
08-08-98 11, Dbl	2	110
09-08-98 11, Dbl	2	110

Screen Prototype

- The screens are shown on the real computer screen but they **have little functionality**
- User may enter data into some of the fields but when he pushes a button or select a menu item, nothing happens by itself
- Response can be simulated by
 - using “secret keys” to open and close specific windows OR
 - putting yellow stickers on the screen with the necessary data

Room	# Pers	Price
07-08-98 .12, Single	1	80
08-08-98 11, Double	2	110
09-08-98 11, Double	2	110

Functional Prototype

- It is similar to a screen prototype, but many buttons, menu items, etc actually do something
- They may for e.g. open and close windows, update data on related screens and bring data forth from a real **database**

The screenshot shows a window titled "Stay". The top right corner has a close button (X). The window contains the following data:

- Stay# : 728
- Name : John Simpson
- Address :
 - 456 Orange Grove
 - Victoria 3745
 - AU
- Pay form : Master
- Passport : A102103 512

Below these fields is a tabbed panel with "Nights" selected. The table below shows room bookings:

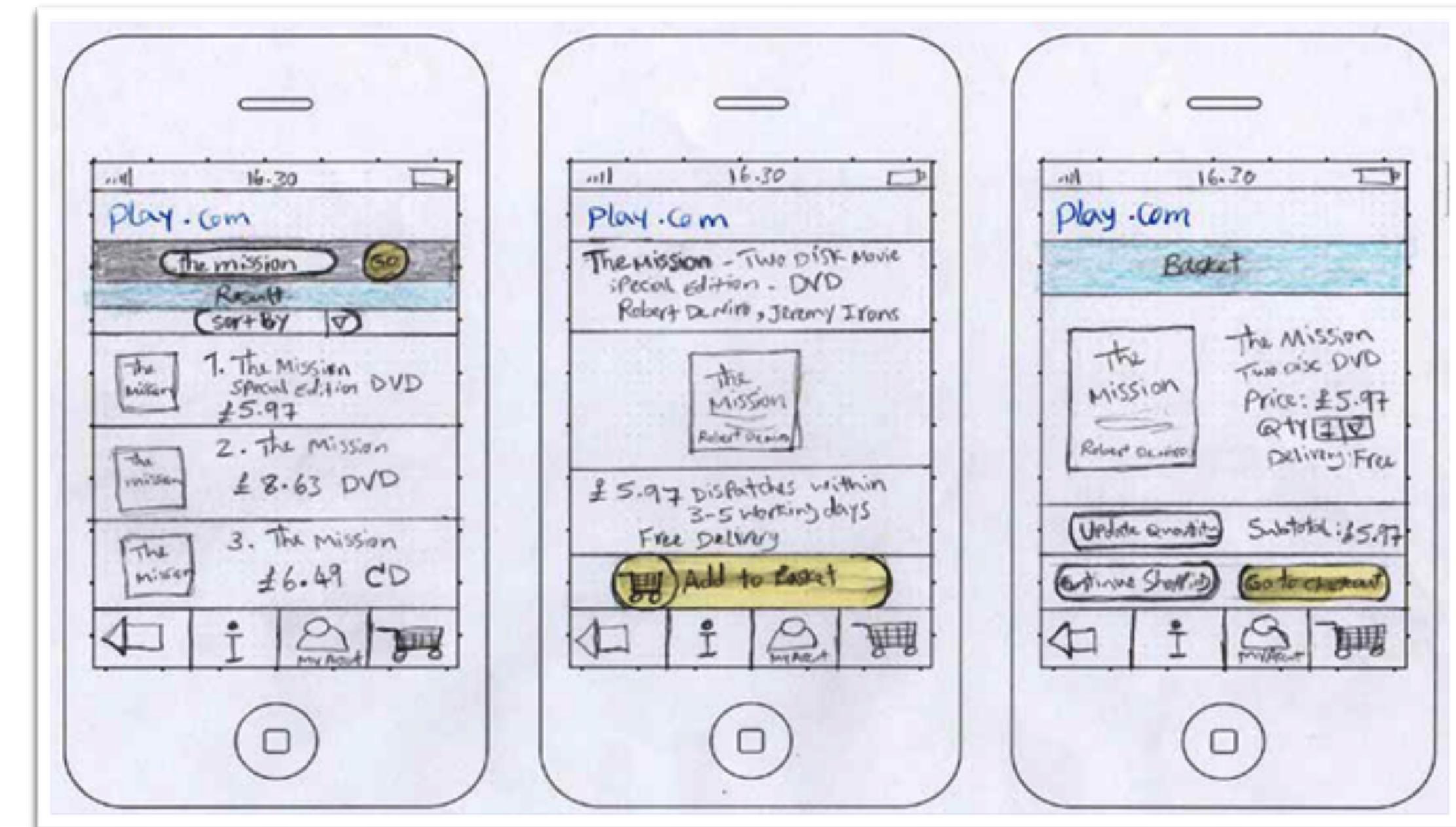
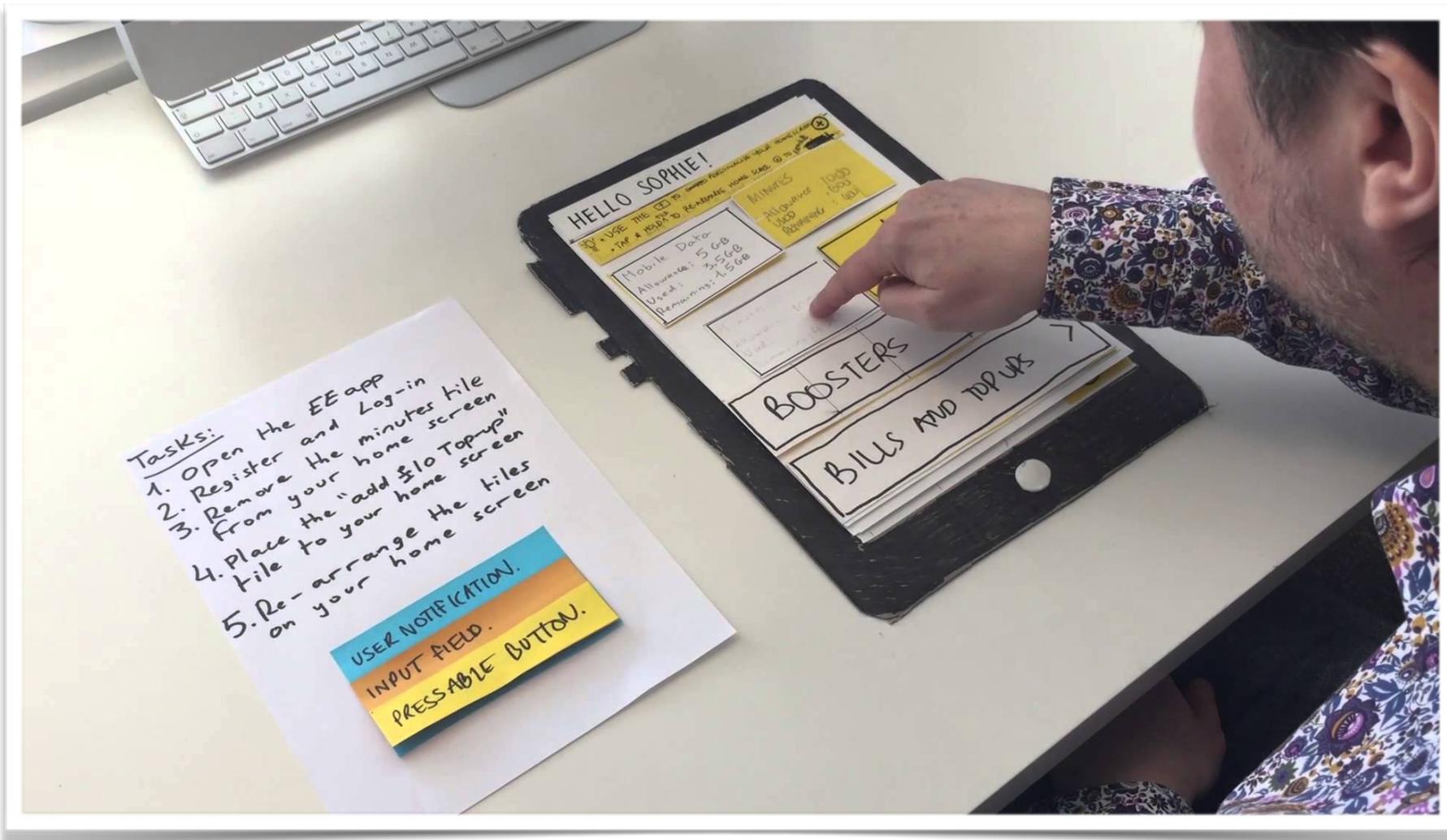
Room	# pers	Price
07-08-98 12, single	1	80
08-08-98 11, double	2	110
09-08-98 11, double	2	110

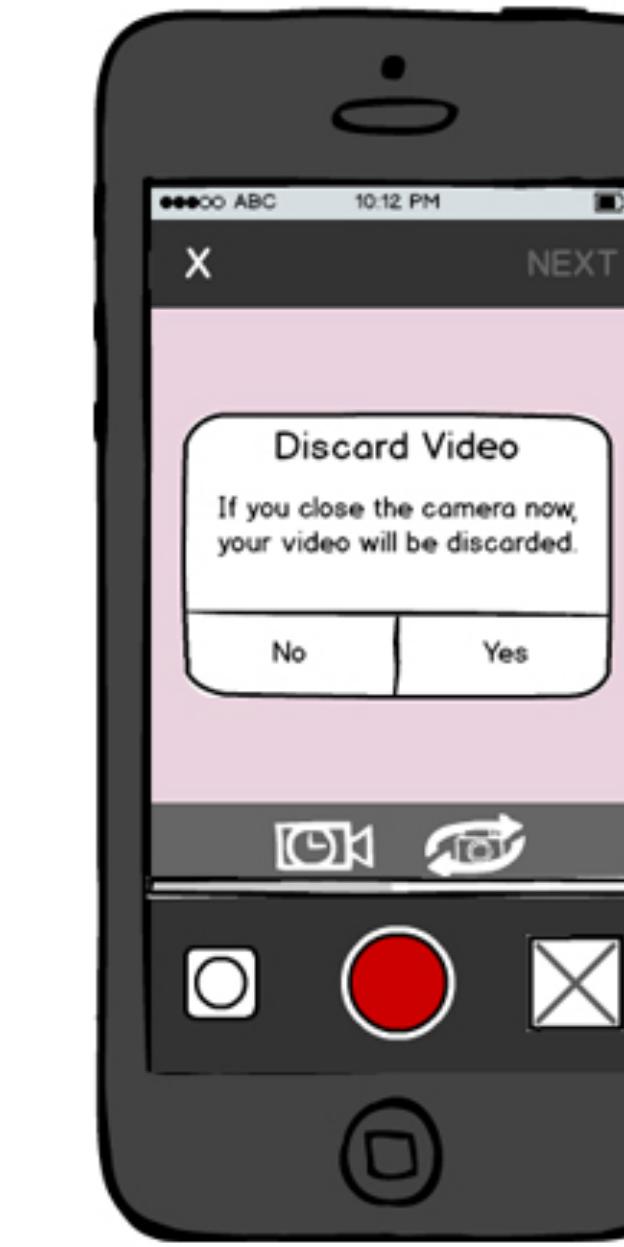
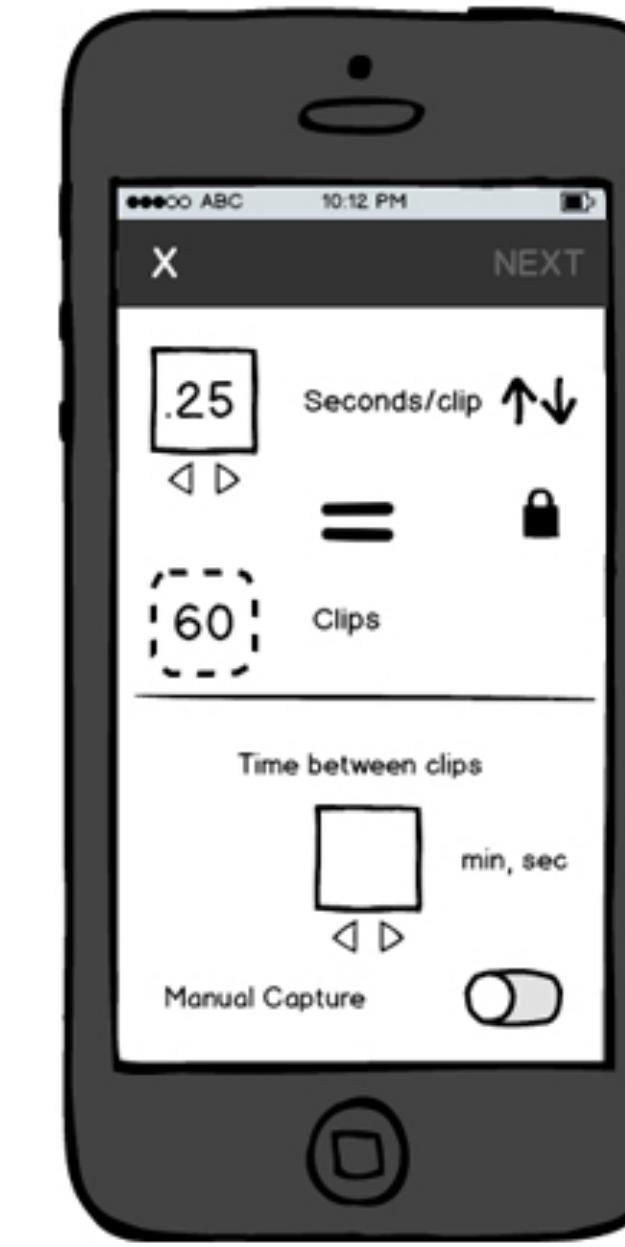
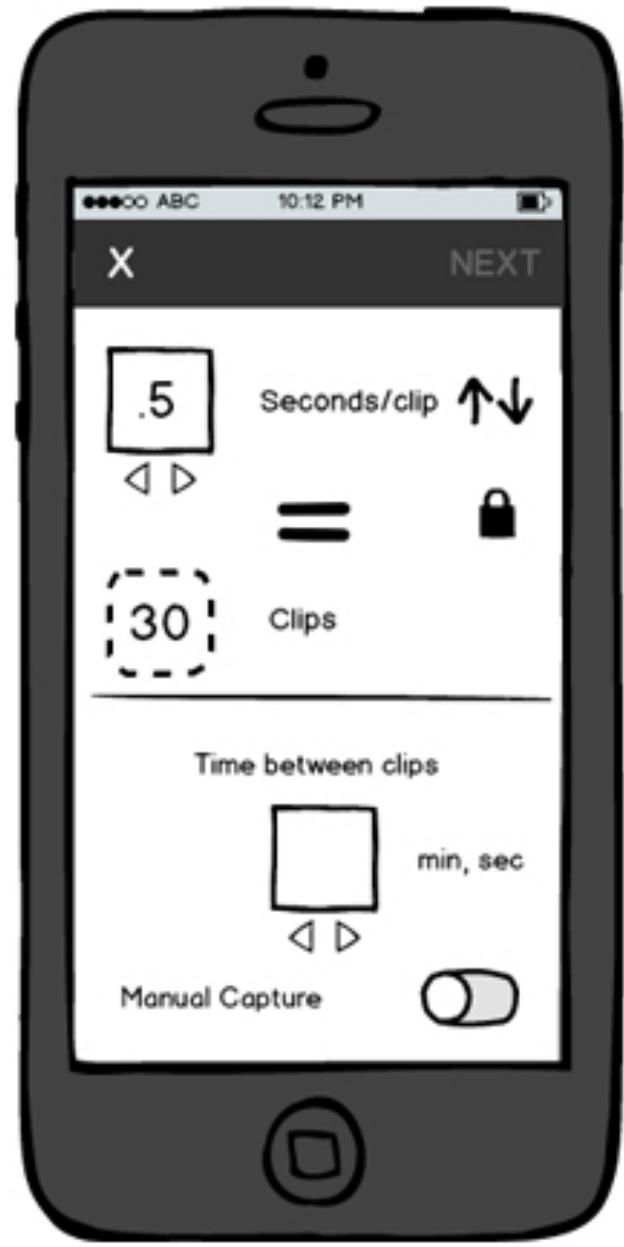
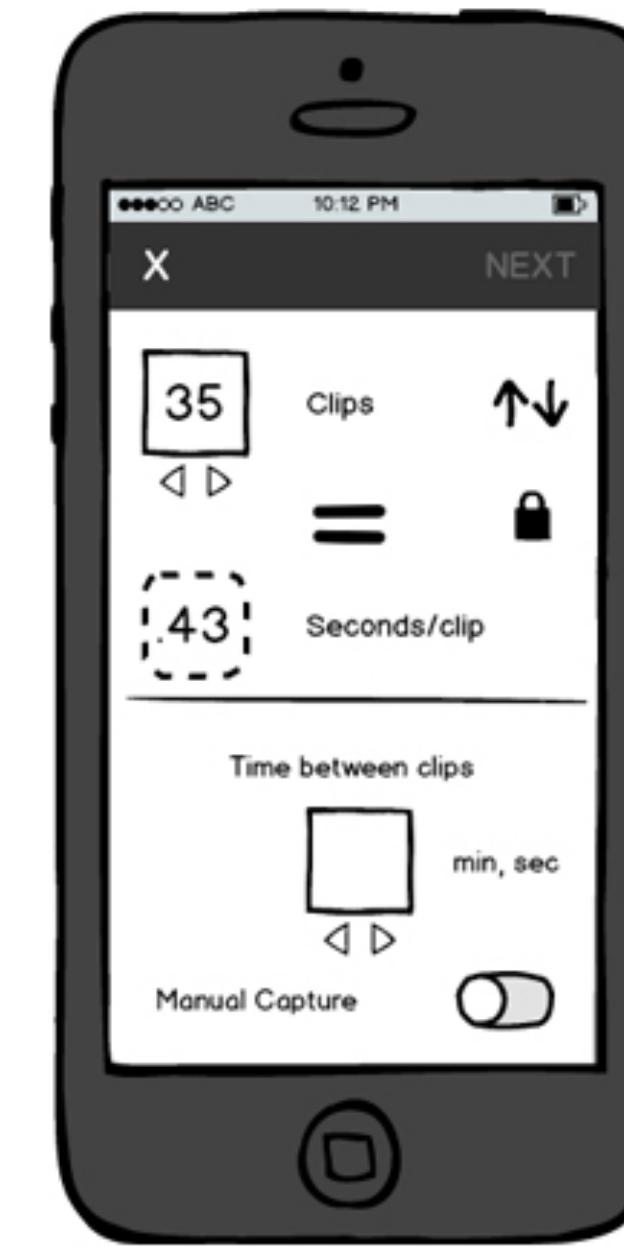
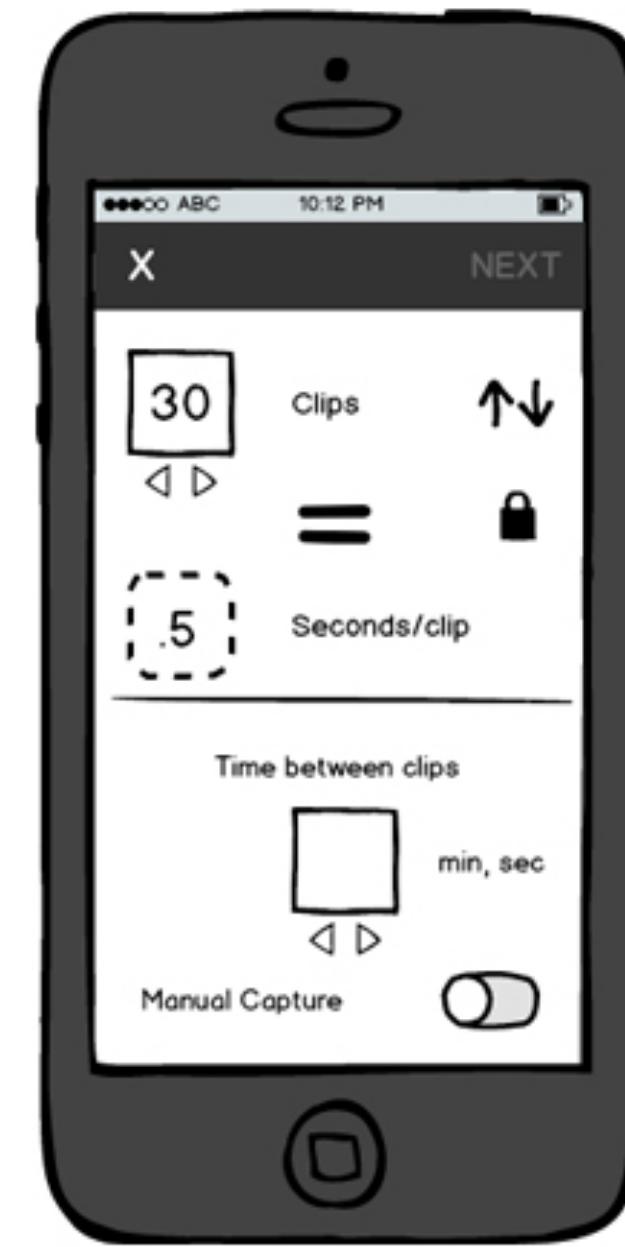
What you need to know?

- Technical issues
 - seek to explore the technical constraints of complex design features.video in an app: compression vs quality? What hardware are needed?
- Work flow, task design
- Screen layouts and information display
 - "how big the icon should be?"

Low Fidelity Prototypes

- **Low Fidelity prototyping** are often paper-based . They range from a series of hand-drawn mock-ups to printouts. Does not look very much like the final product.
- Uses materials that are very different from the intended final version e.g. paper and cardboard, cheap and easy to modify
- Used during early stages of development
- In theory, low-fidelity sketches are quicker to create.
- Low-fidelity prototypes are helpful in enabling early visualization of alternative design solutions.

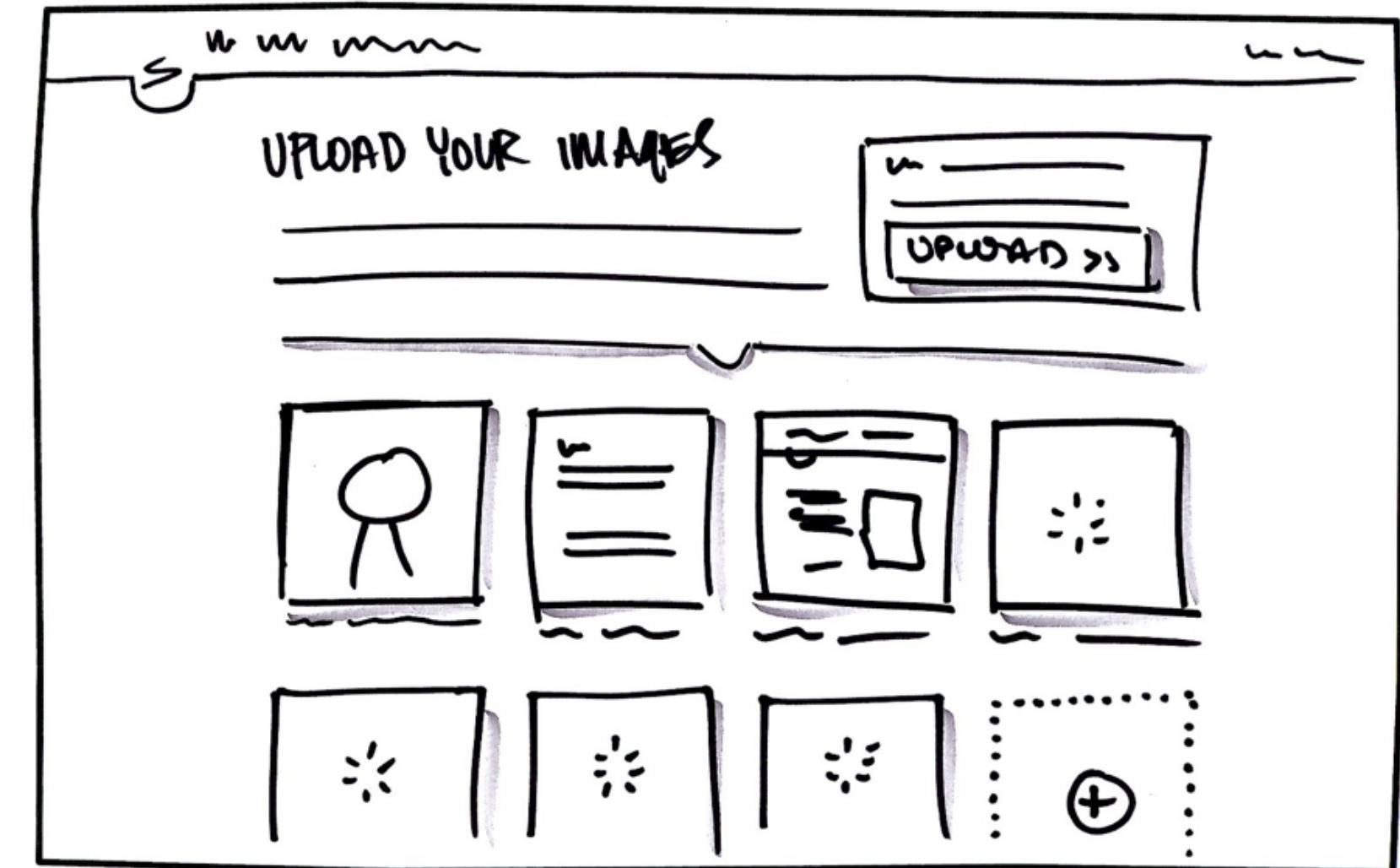




Example of low-fi prototypes

- Sketching
- Storyboards
- Wireframes
- Index cards
- ‘Wizard of Oz’

- Sketching:
 - Sketching is important to low-fidelity prototyping
 - Don't be inhibited about drawing ability. Practice simple symbols
 - Very quick and casual way to brainstorm ideas.
 - For exploring design ideas.



- Storyboard:
 - Originates from the film industry.
 - To critique and compare multiple design concepts.
 - Work out which is the best.
 - Often used with scenarios or UI , 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

Storyboard: SWOP

Scenario: A Networking Event



James RSVPed to a UX Designers happy hour meet up online. He's super excited to go and meet other UX designers in San Francisco.



James arrives at Churchill Bar at 8pm by himself not knowing anyone. Since it's a bar meet up, nobody has name tags and he can't even tell who is there for the meet up or who is there just hanging out on their own accord.



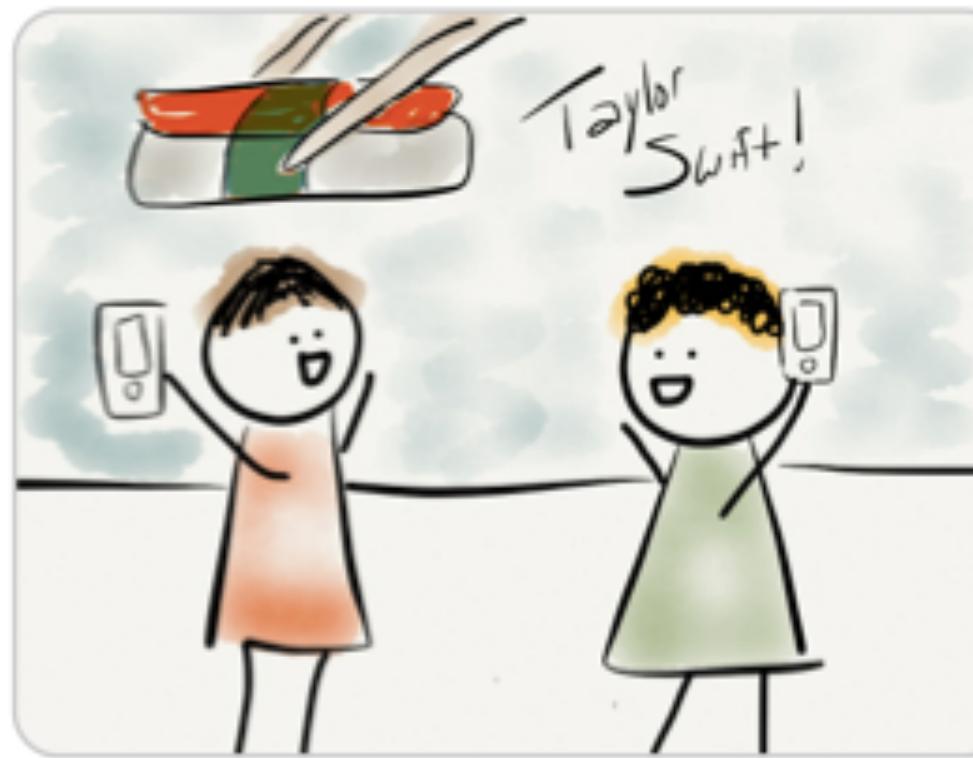
He pulls out SWOP and checks into the UX Designers Happy Hour Event and sees there are already 26 members checked-in.



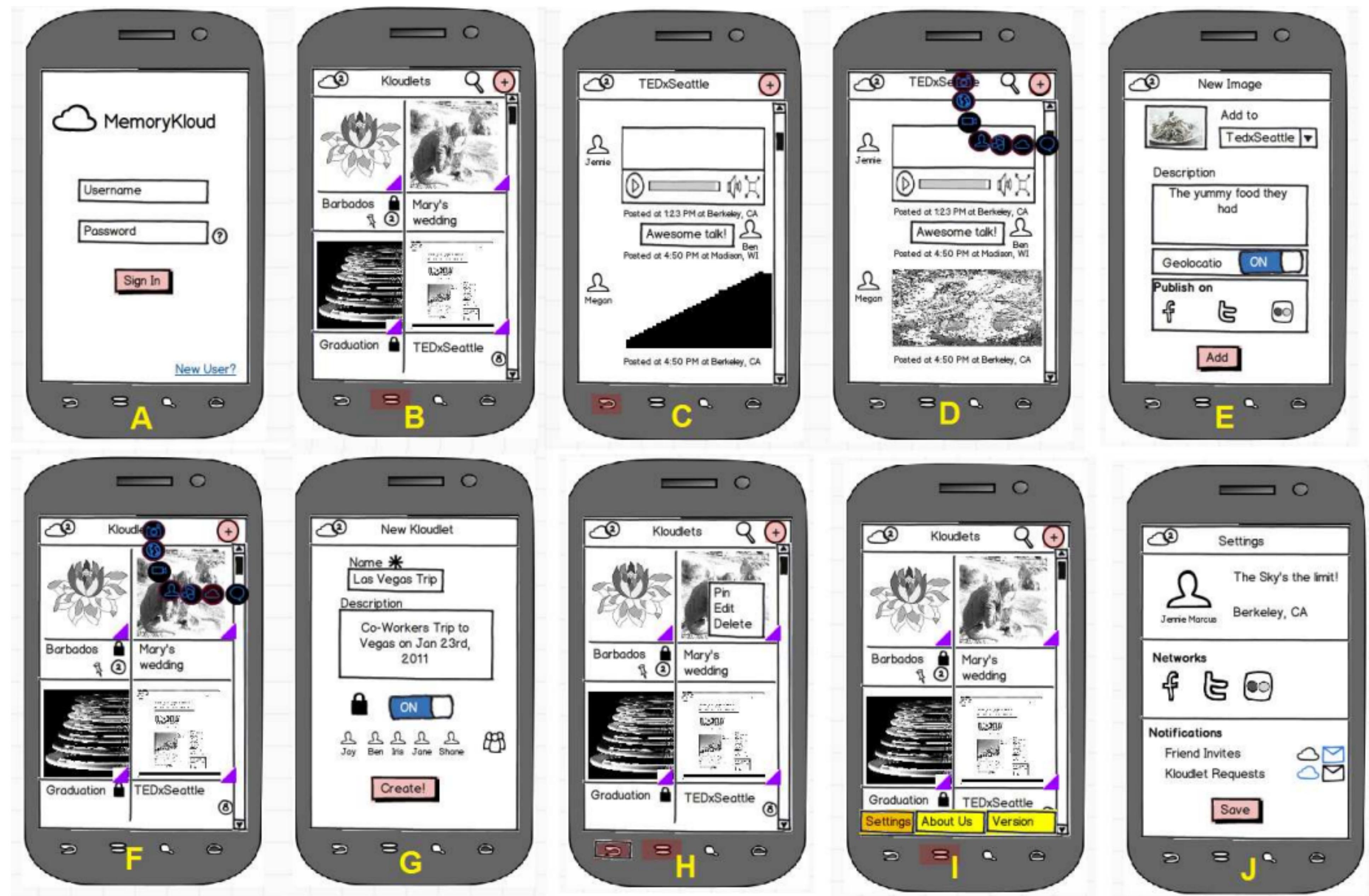
Doing a quick scan of the bar he sees another guy by himself who's on the list as well. James goes over and introduces himself as another UX designer also there for the happy hour meet up.



The two of them SWOP. (Actual physical BUMP not necessary in final prototype.)



They find out that they both love Taylor Swift and Sushi (and of course UX Design). A friendship and business partnership follows.



- Wireframes
 - Once initial design is set, we move towards more details.
 - To design for a layout and navigation. Eg. Screen design and its layouts.
 - Provides general “look and feel”, behaviour and workflows.
 - Drawing is usually simple:
 - With rectangular objects or simple outline.
 - Can also comes with annotations.
 - Sequences of wireframes shows the workflow.
 - Eg. User actions can lead to a state change, this then gets redirected to a different wireframe.

Magic Dew

http://magic-dew.com/ Flow Charts

Banner

Home Tutorials Design Dev Business About Us Contact

About Magic Dew

What we Offer

Where we are located

Our Unique Selling Point

Contact Us

Text Field

Lorum ipsum dolor sit amet, consectetur adipiscing elit. Duis in pede. Nulla facilisi. Lorum ipsum dolor sit amet, consectetur adipiscing elit. Duis in pede. Nulla facilisi. Lorum ipsum dolor sit amet, consectetur adipiscing elit. Duis in pede. Nulla facilisi. Lorum ipsum dolor sit amet, consectetur adipiscing elit. Duis in pede. Nulla facilisi. Lorum ipsum dolor sit amet, consectetur adipisinc

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Text Field

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WELCOME BACK, JULIE **SIGN OUT**

LAYLA'S MEAL PLAN

STAGE: SURVIVED STAYER AGE: 9 MONTHS WEIGHT: 16 LBS 9 OZ. **UPDATE PROFILE**

VIEW BY: DAY WEEK **PRINT OPTIONS**

MONDAY - 3/23

MORNING BREAKFAST SNACK LUNCH AFTERNOON SNACK DINNER EVENING FEEDING

GERBER® 1ST FOODS RICE CEREAL
4 TABLESPOONS

GERBER® 1ST FOODS APPLESauce
2 TABLESPOONS

FOOD OPTIONS

FORMULAS: **GERBER® GOOD START SOY PLUS** **NESTLE GOOD START SOY PLUS**

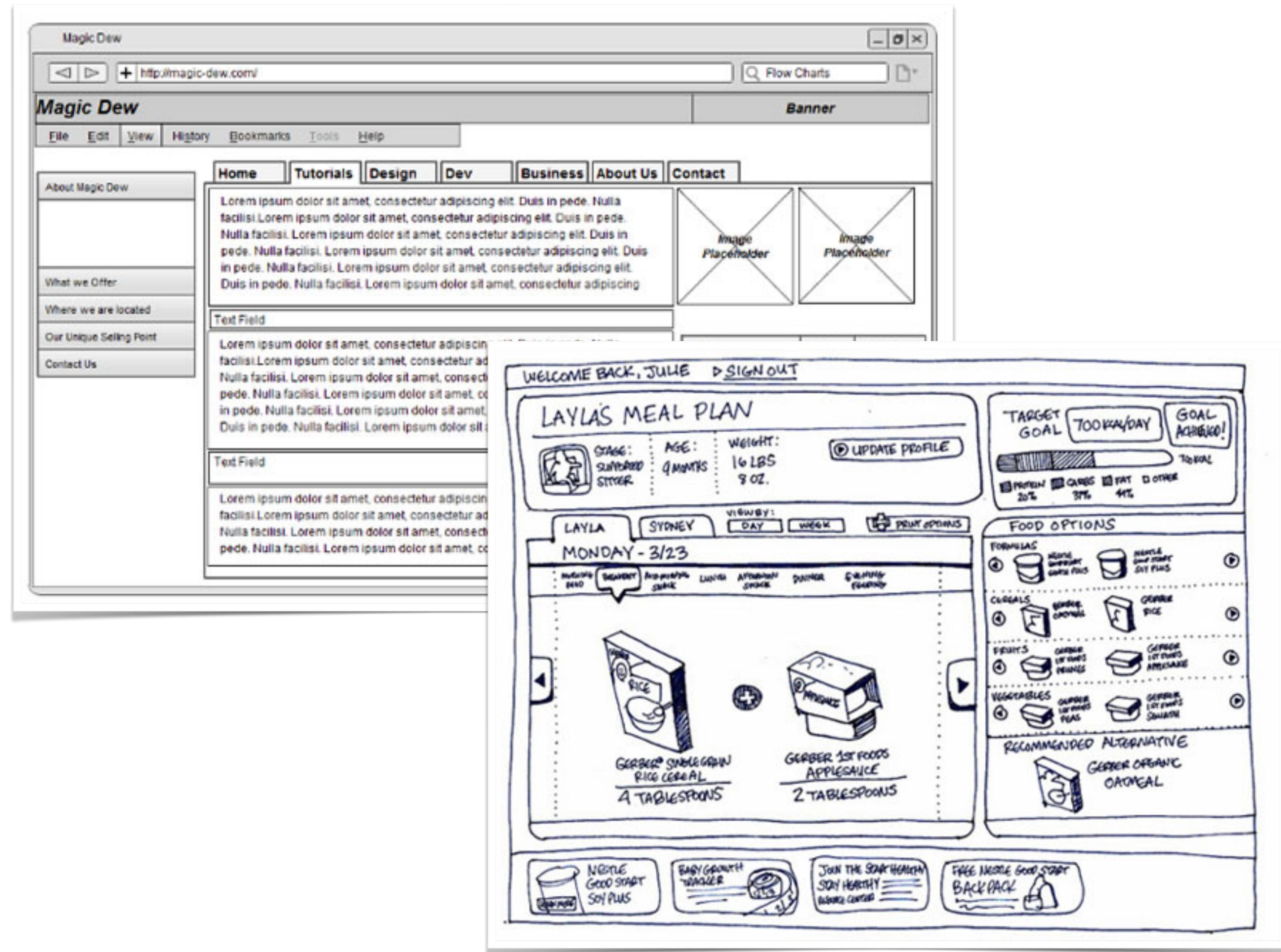
CEREALS: **GERBER® 1ST FOODS CEREAL** **GERBER® 1ST FOODS RICE**

FRUITS: **GERBER® 1ST FOODS FRUIT** **GERBER® 1ST FOODS APPLESauce**

VEGETABLES: **GERBER® 1ST FOODS PEAS** **GERBER® 1ST FOODS SQUASH**

RECOMMENDED ALTERNATIVE
GERBER® ORGANIC CEREAL

NESTLE Good Start Soy Plus **BABY GROWTH WHOLER** **JOIN THE SOUP HEALTHY STAY HEALTHY BLOG CENTER** **FREE NESTLE Good Start BACKPACK**



- Card-based prototyping:
 - Index cards (3 X 5 inches)
 - Each card represents one screen or part of screen
 - Often used in website development





Travel
Organiser

23 August 2006

WELCOME HELEN

Where do you want to go?

YORK

What date do you want to travel?

16/09/06

Which form of transport do you want?

TRAIN ▼

Do you need accommodation?

YES ▼



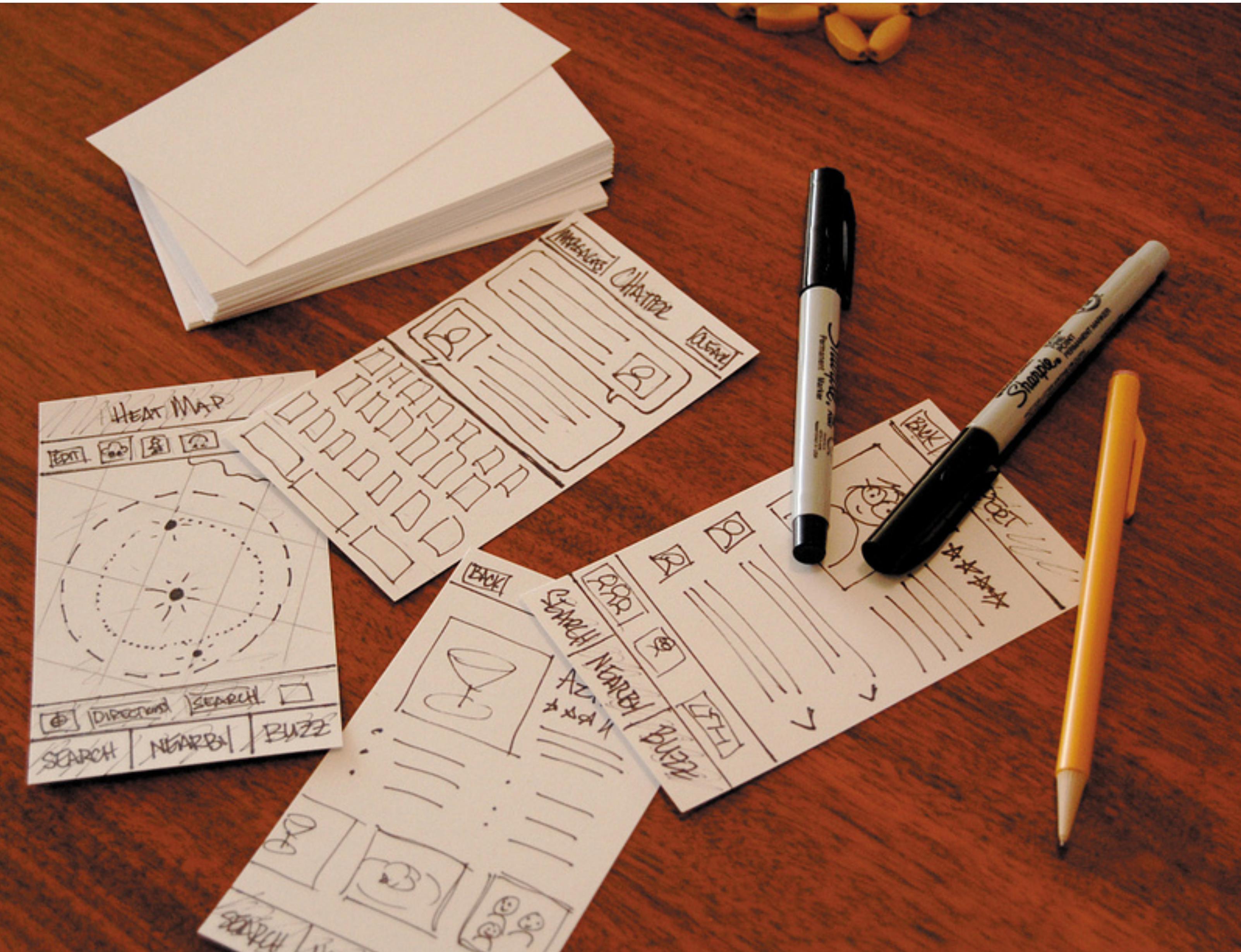
Travel
Organiser

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 mins past 01:30
hour

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



- ‘Wizard of Oz’ prototype:
 - a human operated mirage to simulate the interface to the users. This approach is much faster, cheaper, and more iterative while also being more real than paper prototypes.



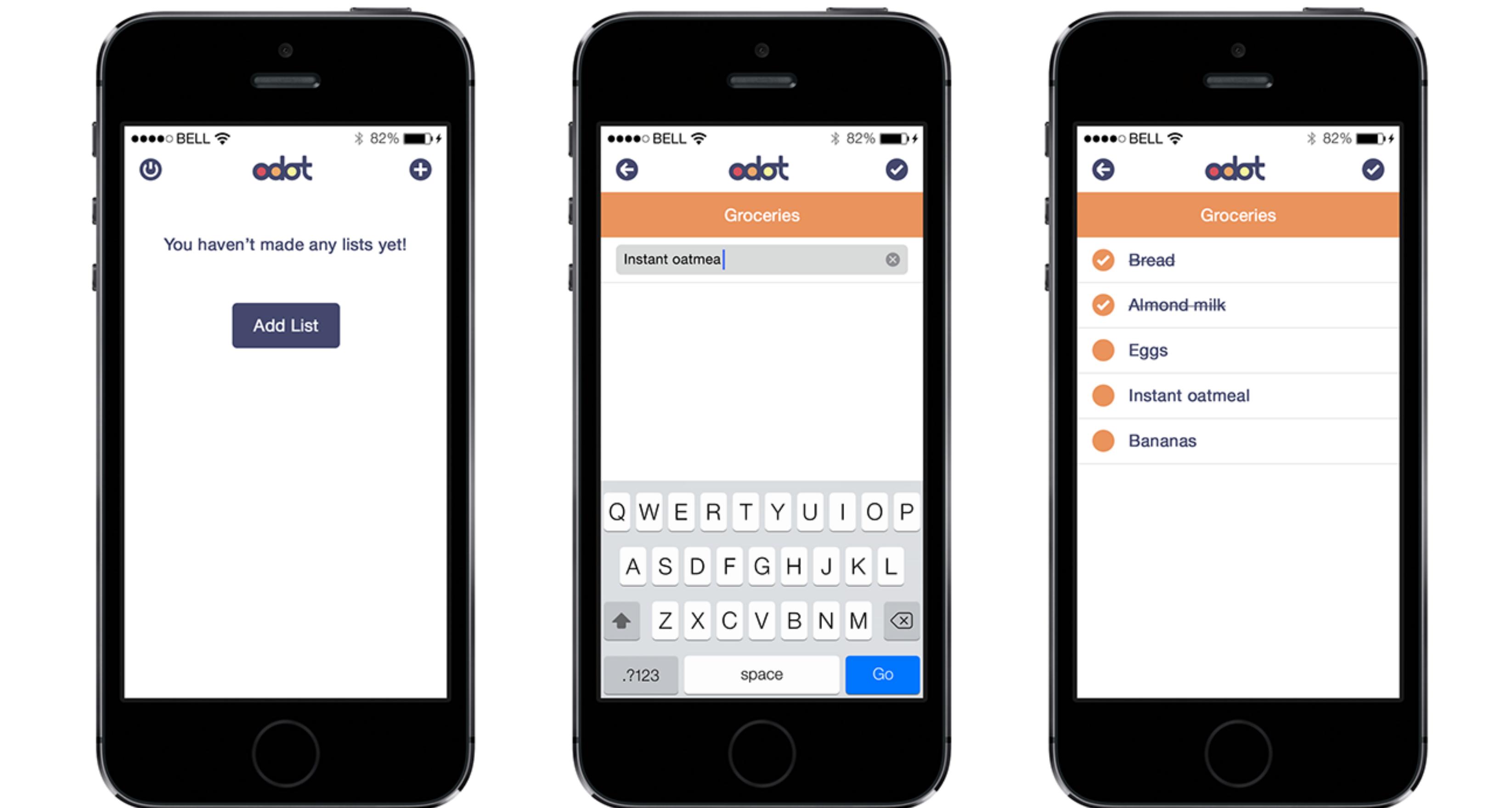
“Wizard of Oz” movie



คู่กรรม

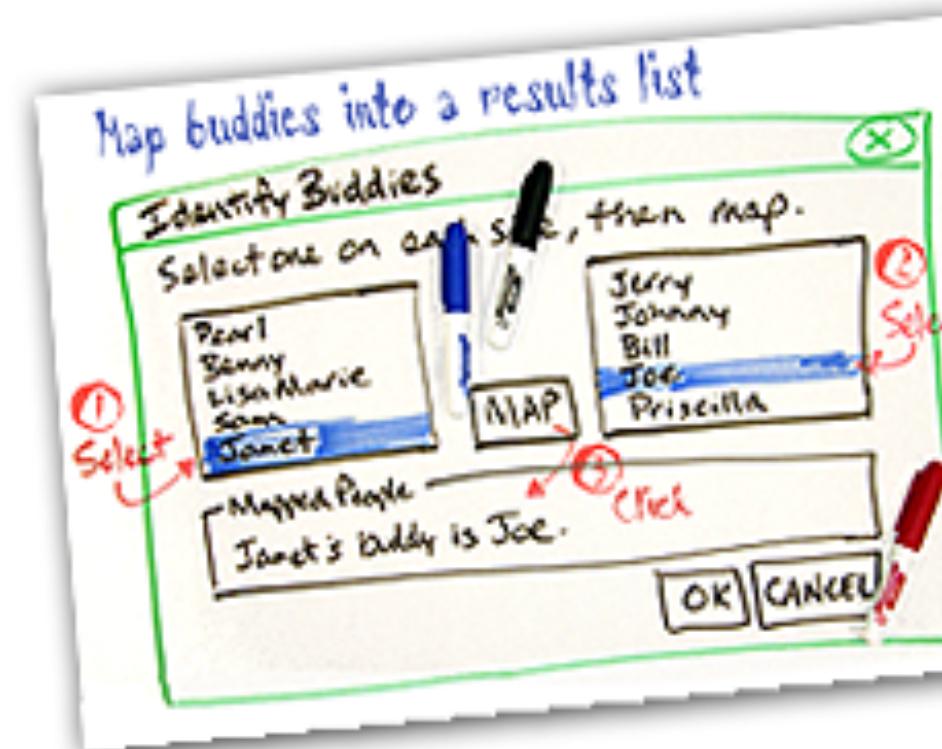
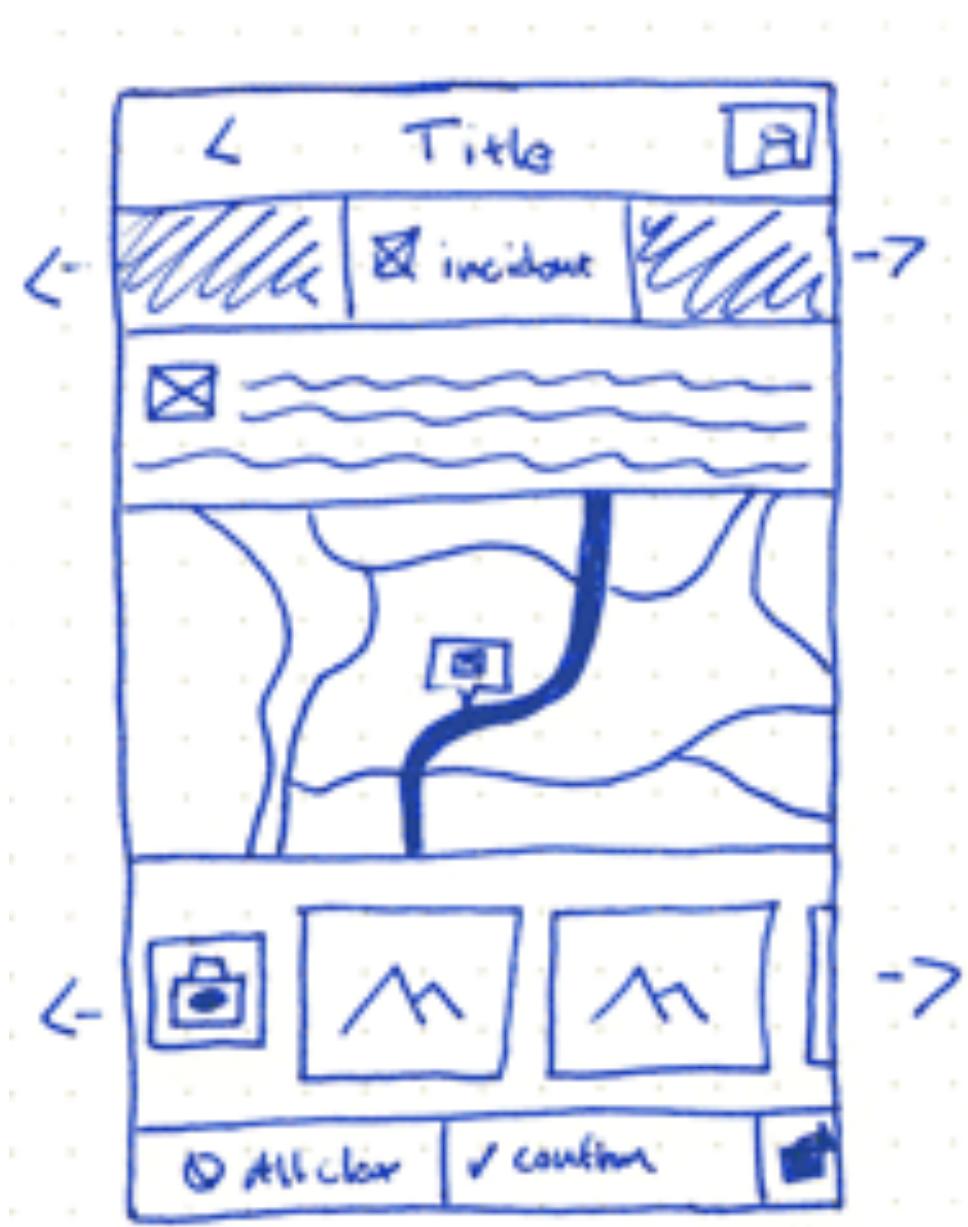
High Fidelity prototype

- **High Fidelity prototyping** are as close as possible to a true representation of the user interface. Looks more like the final system (appearance, not functionality).
- High-fidelity prototypes are assumed to be much more effective in collecting true human performance data (e.g., time to complete a task).
- Common development environments:
 - Adobe XD, Visual Basic, Photoshop, Xcode/Swift (iPhone/iPad), Web development tools

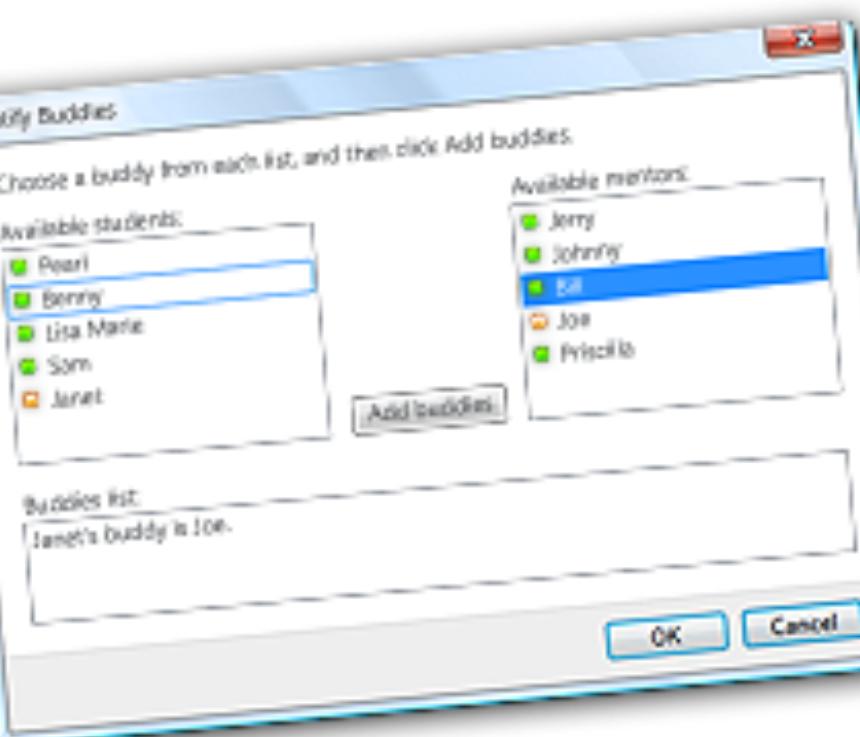
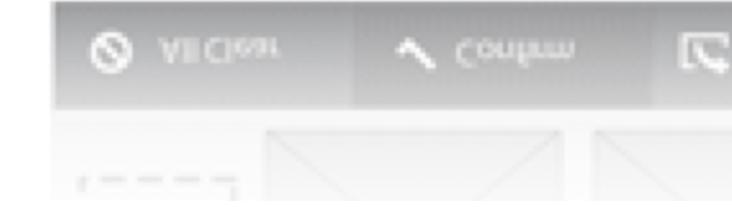


Type	Advantages	Disadvantages
Low-Fidelity	<ul style="list-style-type: none"> -less time & lower cost -evaluate multiple design concepts -useful communication device -address screen layout issues 	<ul style="list-style-type: none"> -limited usefulness for usability tests -navigational and flow limitations -facilitator-driven -poor detailed specification
High-Fidelity	<ul style="list-style-type: none"> -partial/complete functionality -Interactive -user-driven -clearly defines navigational scheme -use for exploration and test -marketing and sales tool 	<ul style="list-style-type: none"> -time-consuming to create -inefficient for proof-of-concept designs -blind users to major representational flaws

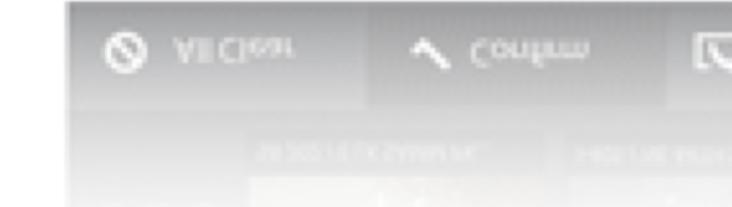
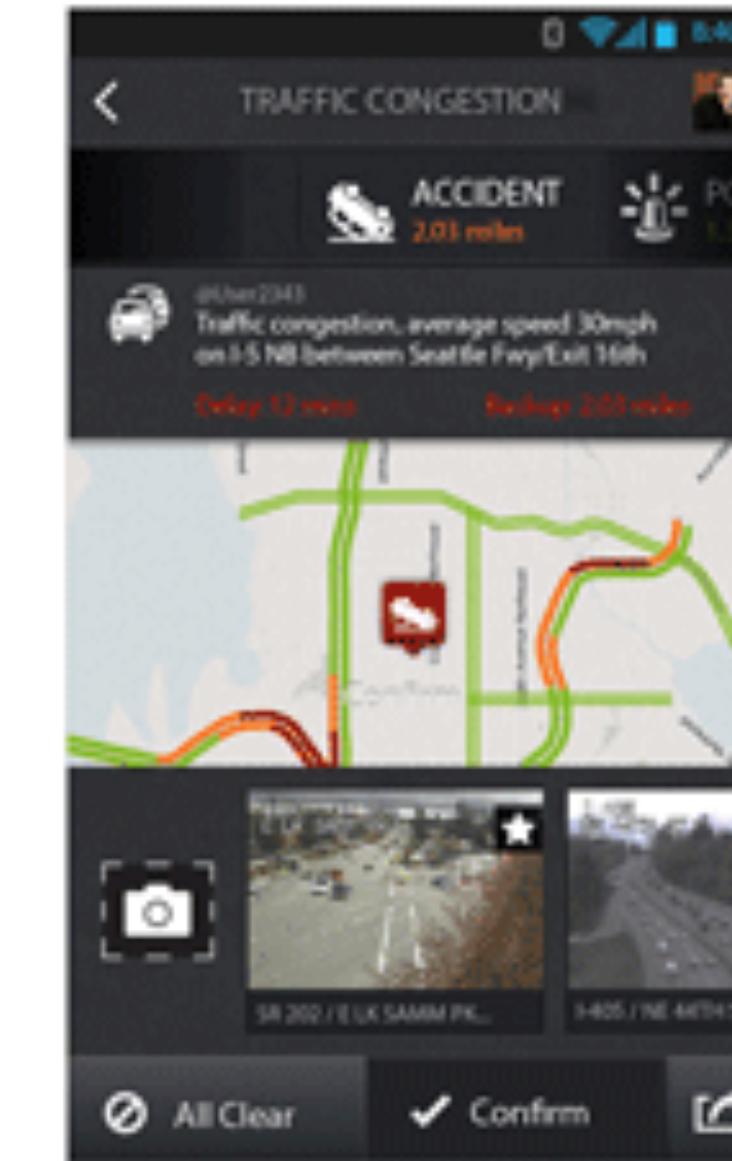
SKETCH



LOW-FI



HI-FI

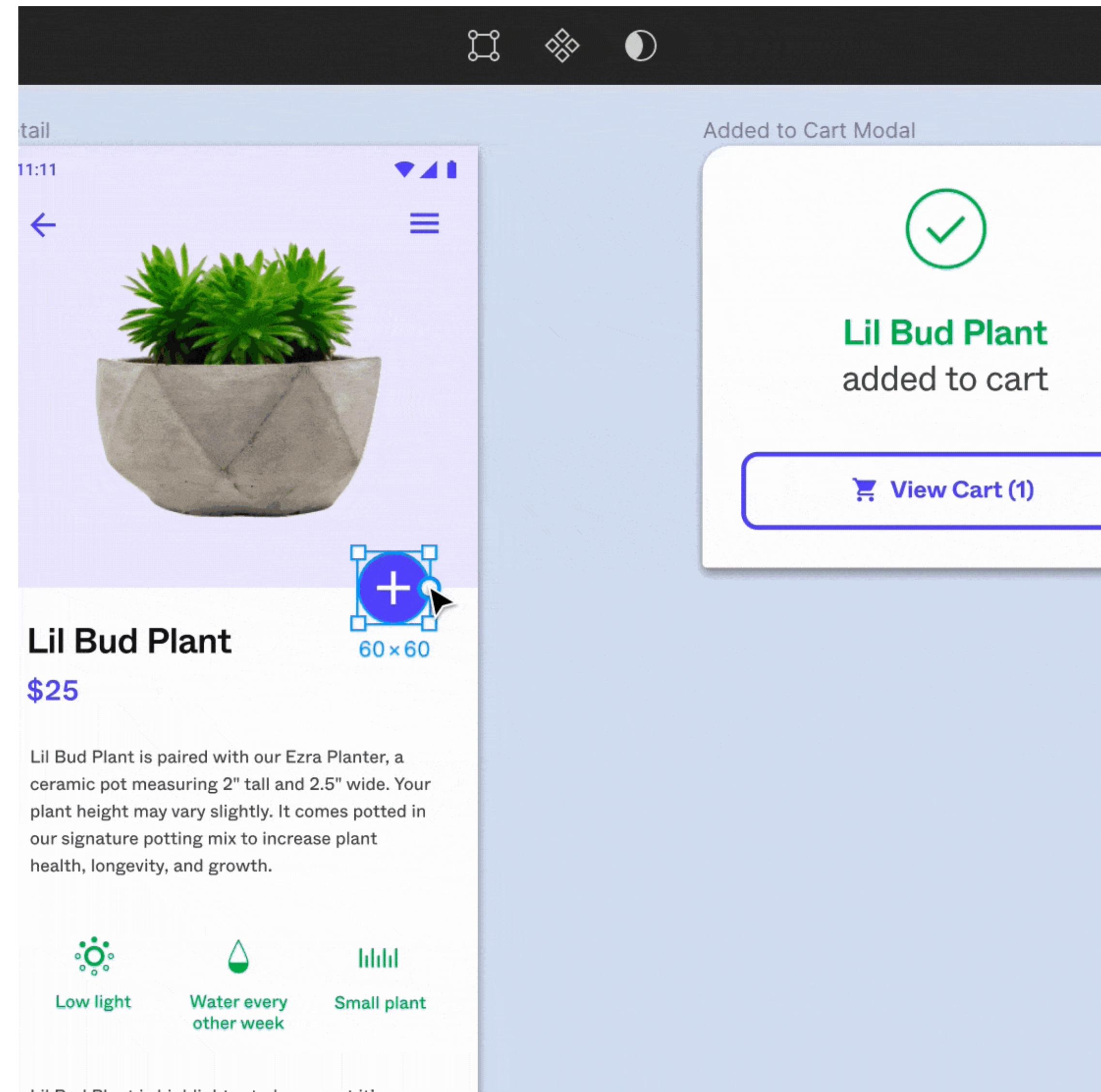


Compromises

- All prototypes involve compromises
- 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

Tools for prototyping

<https://www.figma.com>
(Paid; trial version)



Tools for prototyping

<https://balsamiq.com/> (Paid; trial version)

-



Desktop Apps

Mobile Apps

Web Sites

Dialog Windows



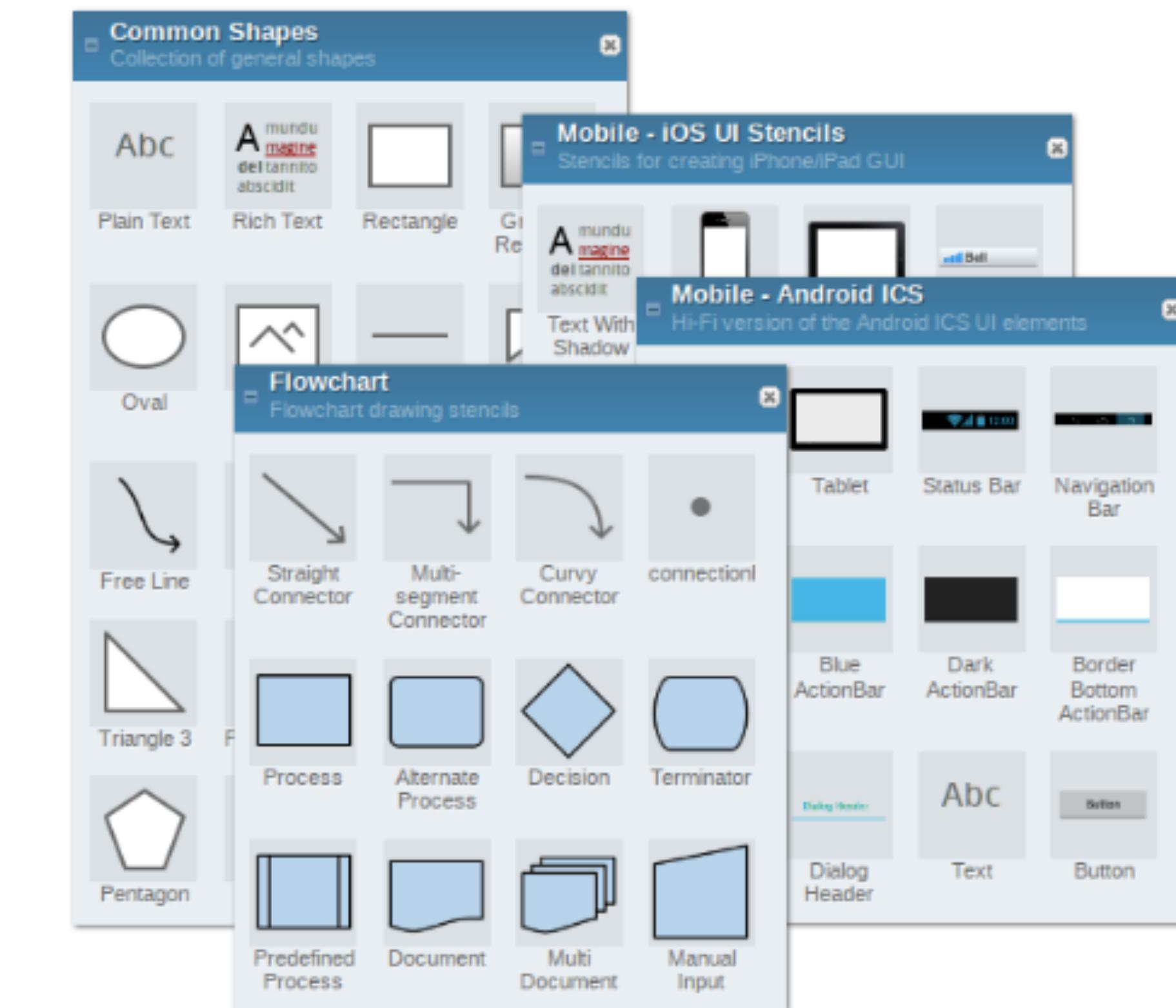
Desktop Apps

Web Apps

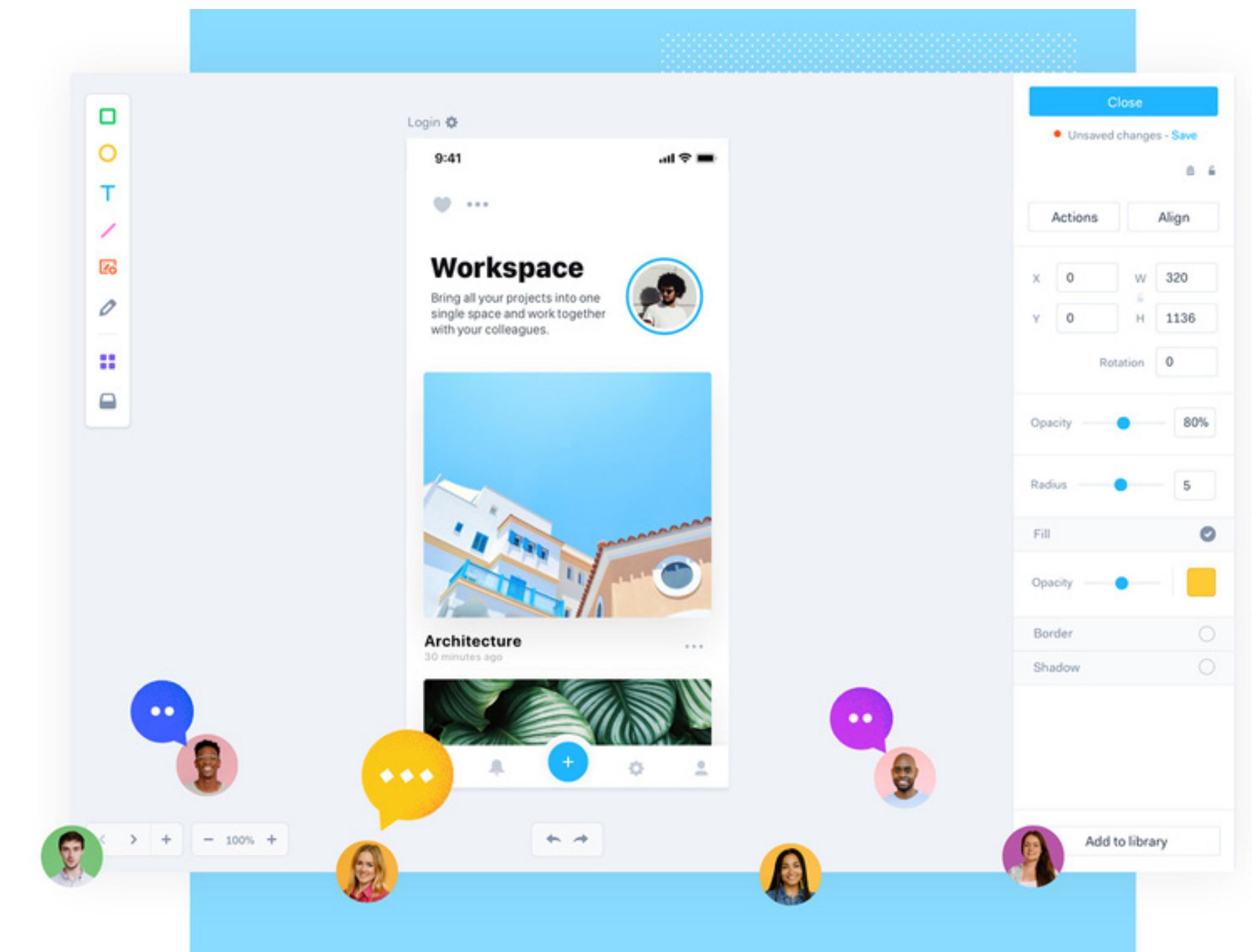
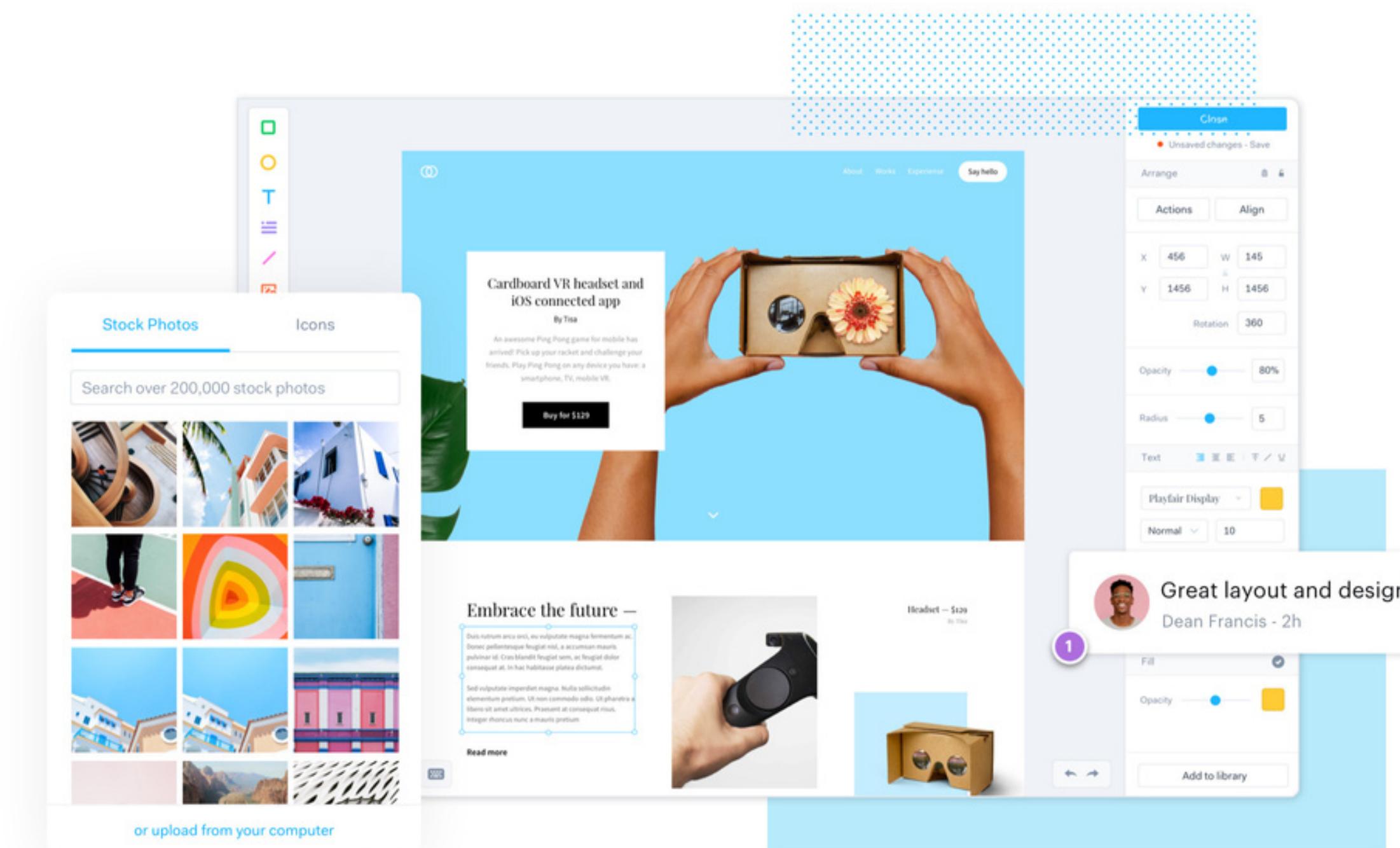
Tablet Apps

77 Built-In Controls

<http://pencil.evolus.vn/> (Open Source)

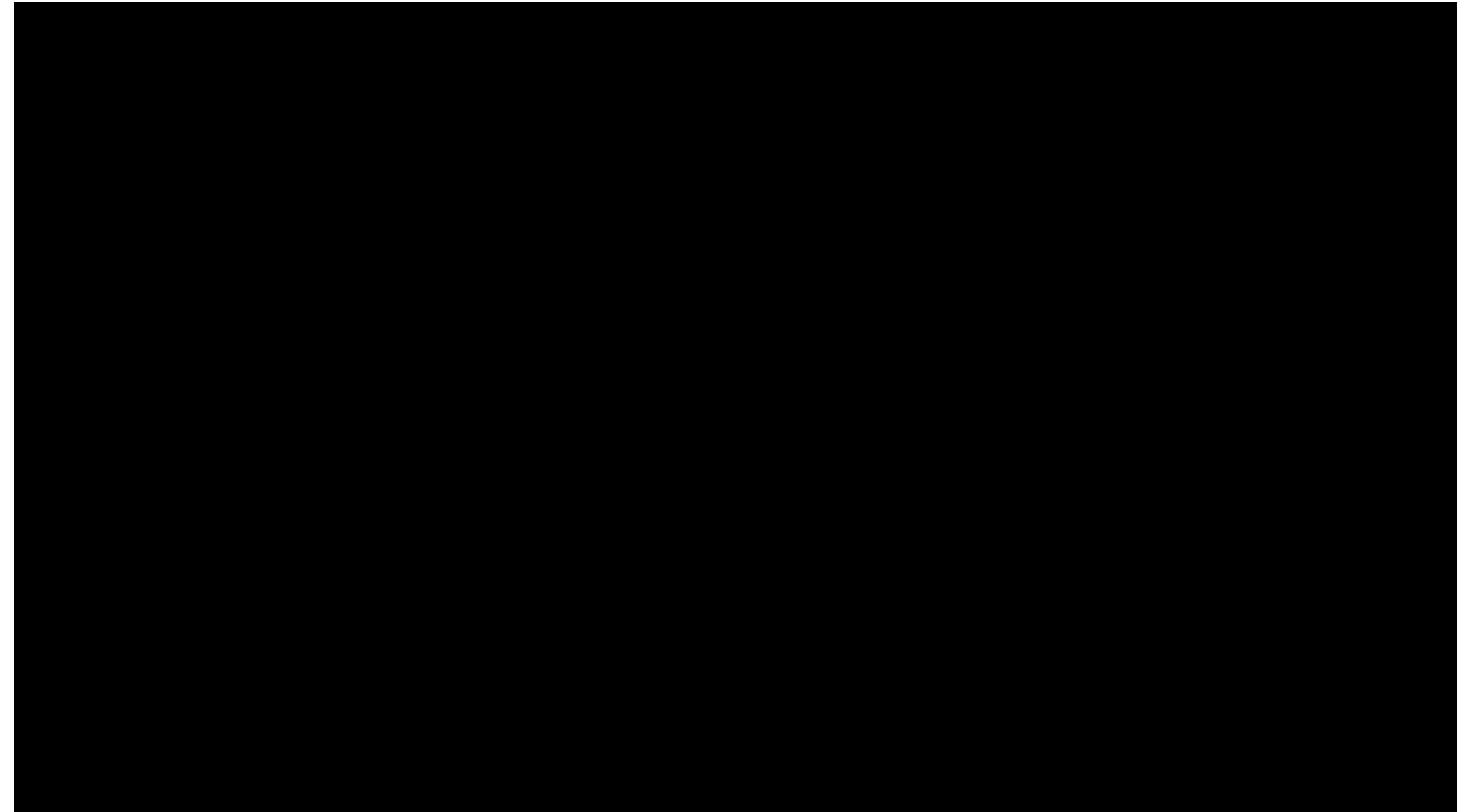


- <https://marvelapp.com> (free account)

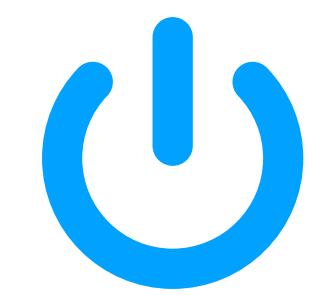


<http://www.uistencils.com/> (Kits for paper prototyping)





Sketching & Paper Prototyping

 **Thank you**