Prototype - HCI

What is a prototype?

A realistic representation of what the product will look like, in this case a website. The final result can look exactly like the mockup, or be a variation of it after version revisions. While some people prefer to draw the mockups using graphic software, others do it straight in HTML/CSS.

Prototyping

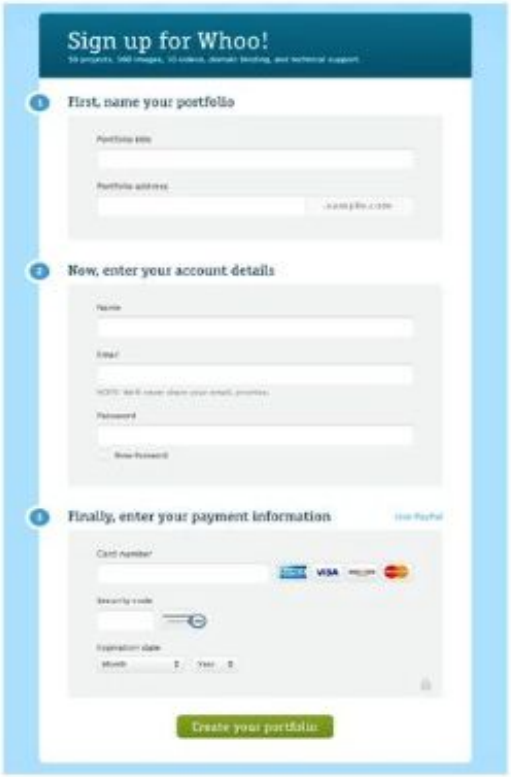
- A limited representation of a design that allows users to interact with it and to explore its suitability
- Allows stakeholders to interact with the envisioned product, gain some experience of using and explore imagined uses
- Production of an intermediary product to be used as a basis for testing
- Aim is to save on time and money
- Aim is to have something that can be tested with real users

Why prototype

- Communication device among team members
- Test out technical feasibility of an idea
- Effective way for user testing/evaluation
- Clarifying vague requirements
- Check if the design direction is compatible with the rest of the system development

Recommended in software design, to come before any writing of code

Form Design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Programs for Wireframing and Prototypes

Balsamiq

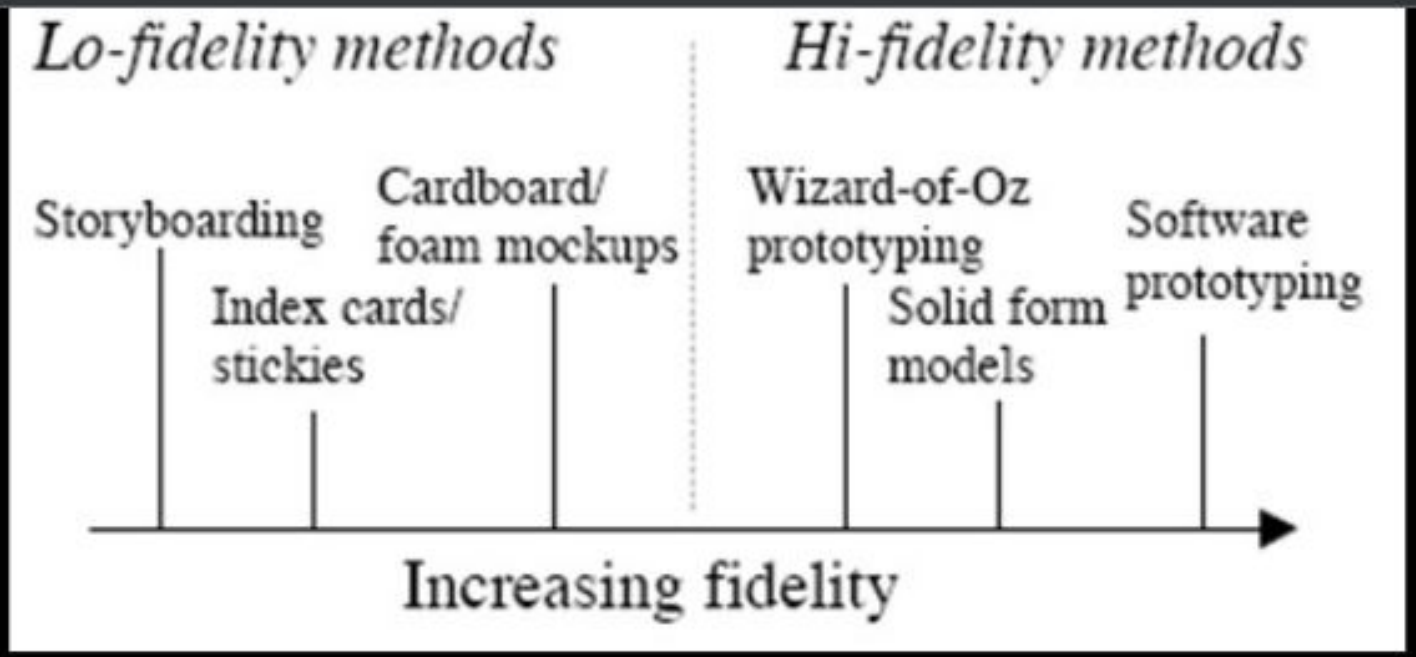
FIDELITY

- Degree to which prototype accurately represents the appearance and interaction of the product
- Judged by how it appears to the person viewing it
- Not similarity to actual application
- Not the degree to which the code and other attributes invisible to the user are accurate

Fidelity Spectrum

- High Fidelity
  - Close to final product
  - Electronically faithful
  - Uses similar media
- Low Fidelity
  - Basis for final product
  - Proof of concept
  - Use of low cost, non-electronic media

Types


Lo-fidelity methods
Hi-fidelity methods
Storyboarding
Index cards/ stickies
Cardboard/ foam mockups
Wizard-of-Oz prototyping
Solid form models
Software prototyping
Increasing fidelity

Low-fidelity prototyping

- The prototype only retains limited characteristics of the final product
- They are **cheap** and **quick** to produce -
  they support the exploration of alternative
  designs (multiple iterations), **can re-design at lower cost**
- They are particularly good for:
  - Considering early design issues, e.g. layout of controls and display items, sequencing, etc.
  - Identifying fundamental problems, i.e. those which lead to errors, confusions, major dislikes

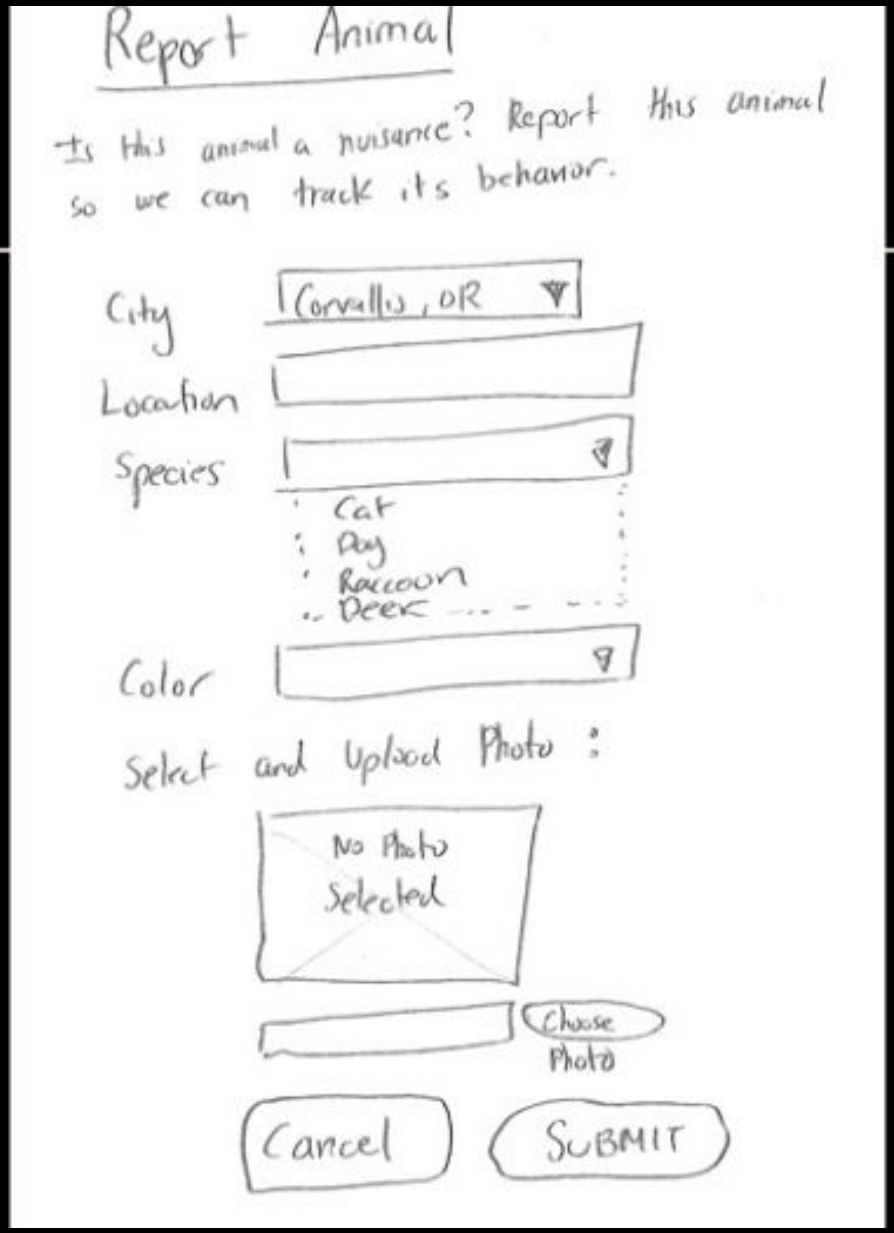
Different kinds of prototypes

- Throwaway prototypes
  - *Paper prototypes*: sketches on pieces of paper
  - *Low-fidelity prototypes*: implemented with a tool (e.g.: Photoshop)
- Evolutionary prototypes
  - *High-fidelity prototypes*: implemented on the target platform… not fully functional, but destined to be incorporated into the final product

Paper prototypes

- Sketch on paper and/or post-it notes
- Don’t worry (much) about colors, fonts, icons
- Doesn’t need to be beautiful

- Does need to show all important UI elements
- Does need to be intelligible by users



1. User selects a city
2. User enters information about the animal
3. System validates inputs
4. System records report in database

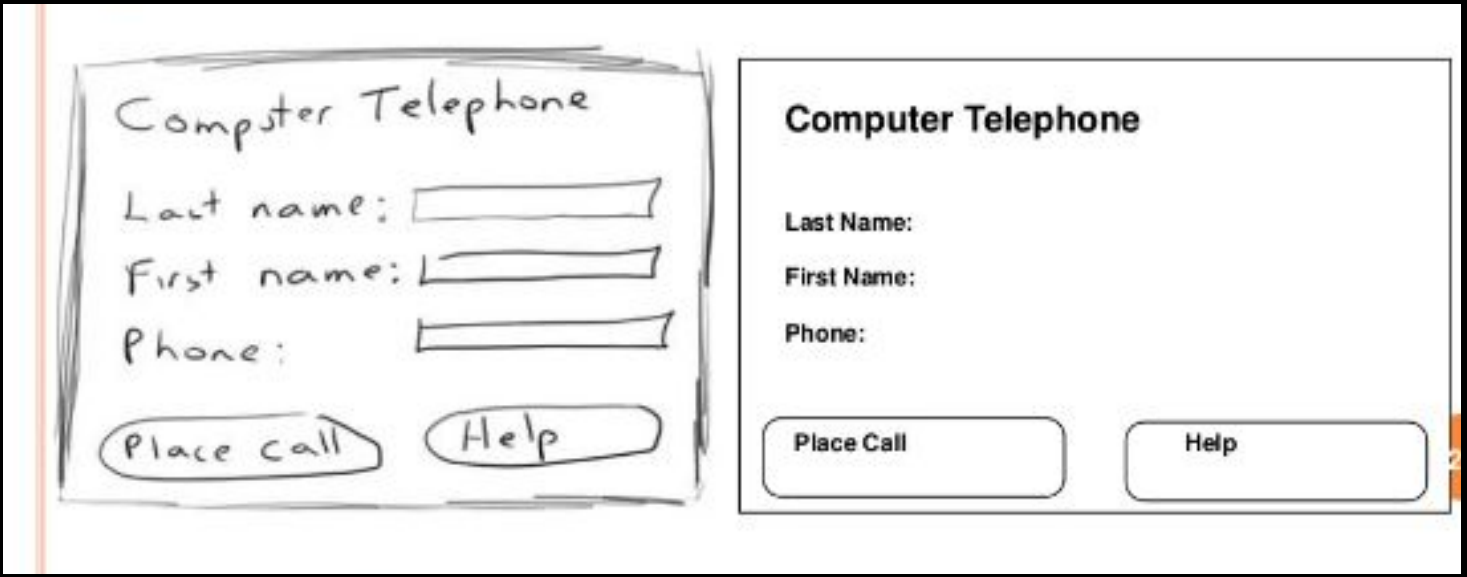
Animal List

Status: Newly Reported, Tracking, Nuisance, Not Nuisance

Corvallis, OR

Last Location	Species	Color	Photo	Status	Tag
3rd & Harrison	Cat	Brown		Tagged	RFID
9th & Monroe	Squirrel	Grey		New	RFID
Walnut & 13th	Deer	Brown & White		New	RFID
Circle & 9th	Dog	Black		New	RFID

1. Volunteer reviews list or map of animals
2. Volunteer locates animal and tags it
3. Volunteer registers RFID to animal


Compster Telephone
Last name:
First name:
Phone:
Place call
Help
Computer Telephone
Last Name:
First Name:
Phone:
Place Call
Help

Low-fidelity Prototyping

- Uses a medium which is unlike the final medium, e.g. paper, cardboard
- Is quick, cheap and easily changed
- Examples:
  - sketches of screens, task sequences, etc
  - ‘post-it’ notes
  - storyboards
  - ‘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

Sketching

- Sketching is important to low-fidelity prototyping
- Don’t be inhibited about drawing ability. Practice simple symbols

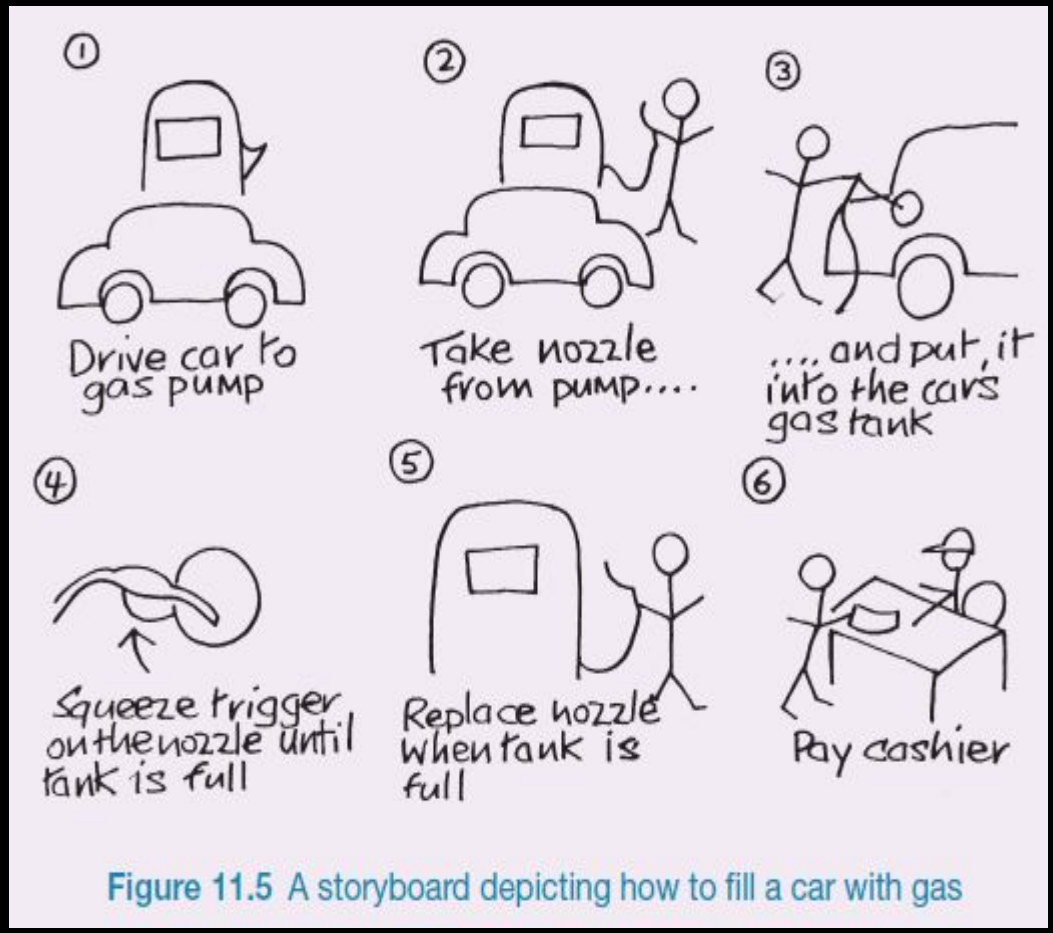


Figure 11.5 A storyboard depicting how to fill a car with gas

Generate storyboard from scenario

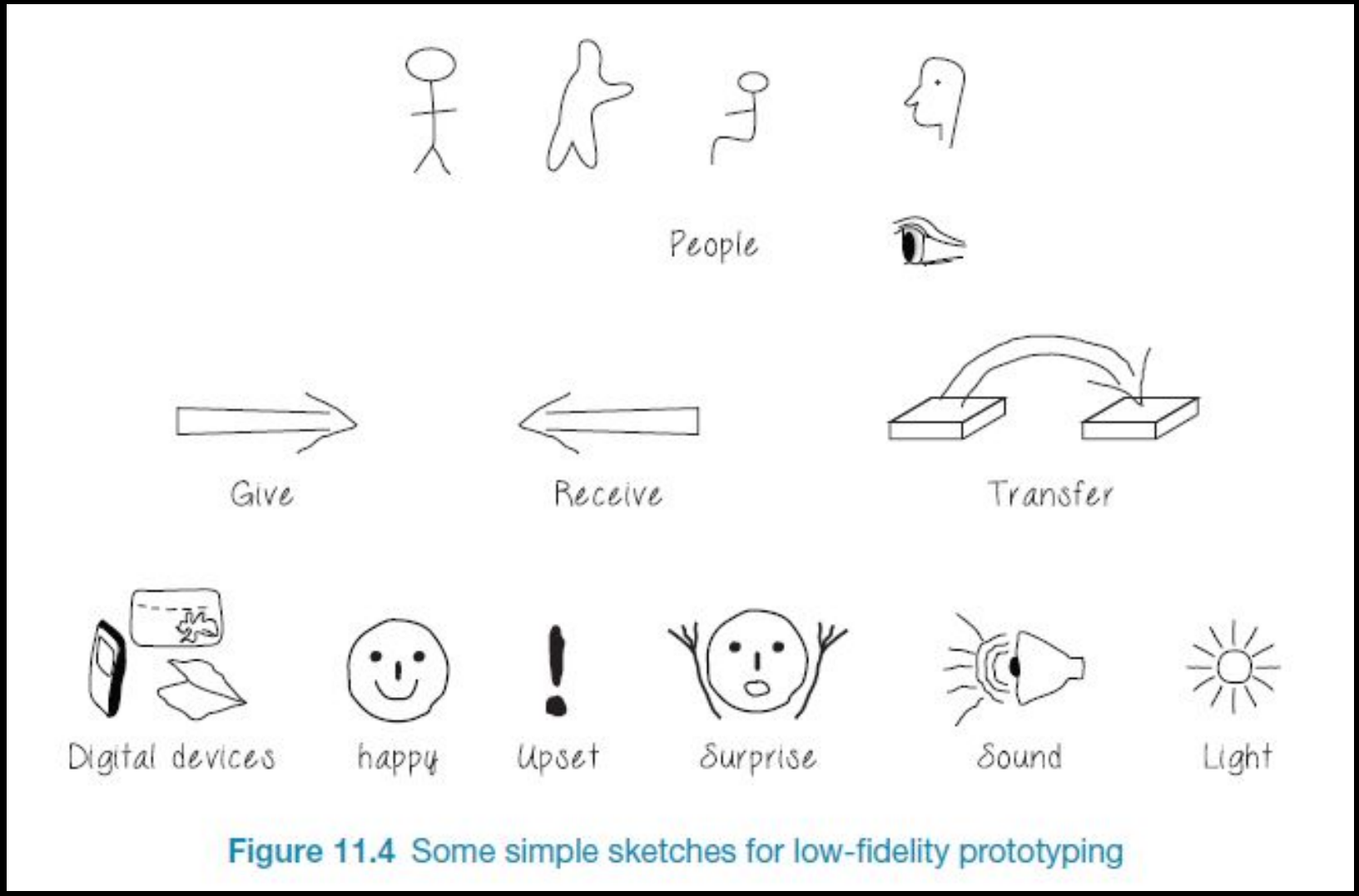


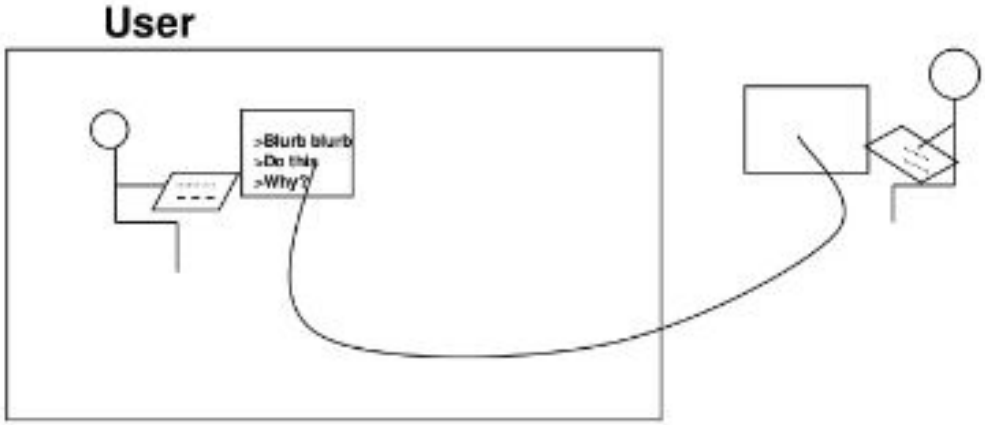
Figure 11.4 Some simple sketches for low-fidelity prototyping

Card-based prototypes

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

'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



Low-fidelity prototyping

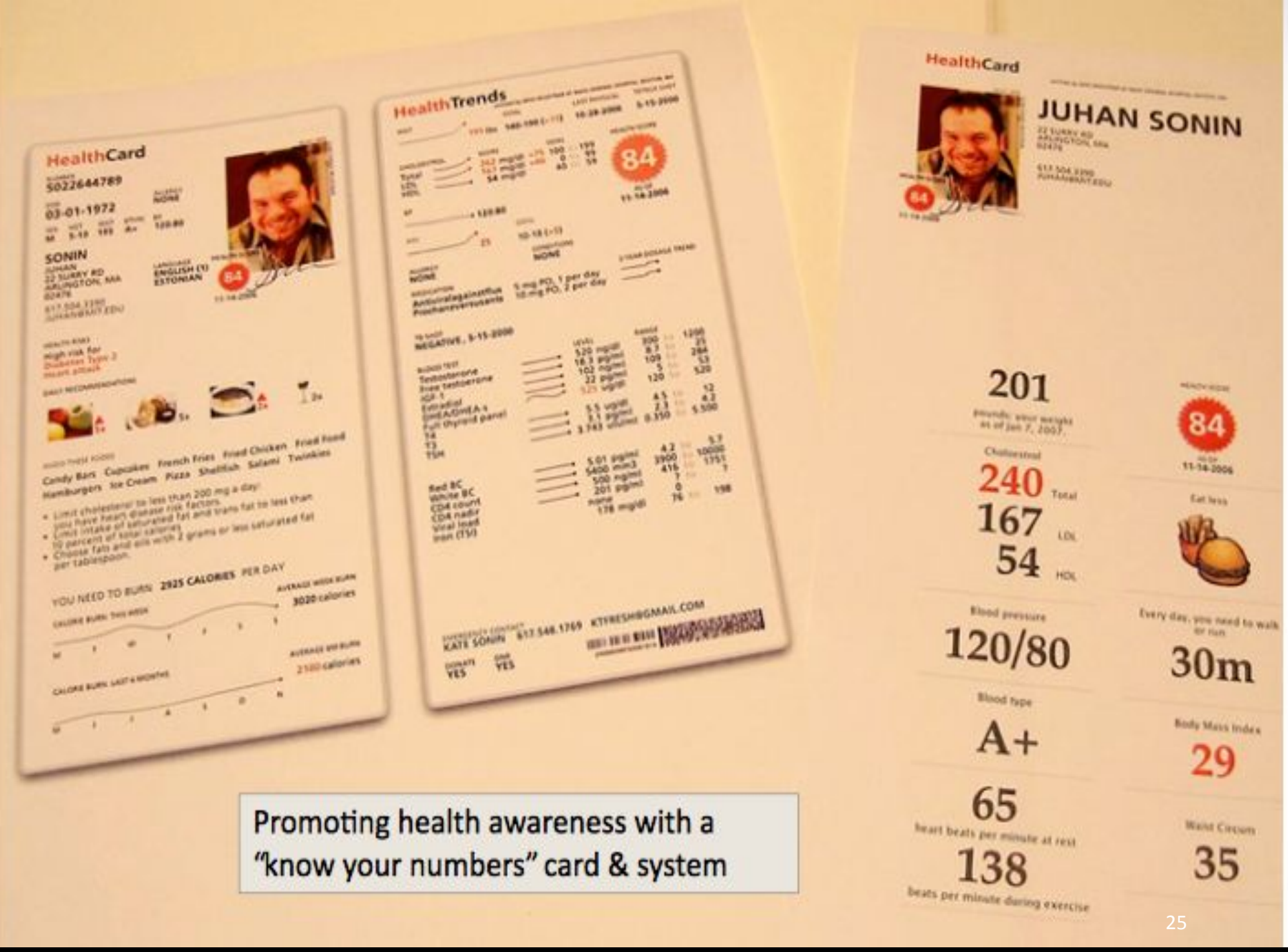
- Advantages
  - **Lower cost**
  - **Evaluate multiple design concepts**
  - Useful communication device
- Disadvantages
  - **Limited error/usability checking**
  - **Facilitator driven**
  - Navigational and flow limitations

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
- High-fidelity prototypes can be developed by integrating existing hardware and software components
- Danger that users think they have a complete system…….see compromises

High Fidelity (hi-fi) Prototyping

- Hi-fi prototypes are realistic and detailed in design. The spacing, graphics and interface elements will look precisely like the actual product.
- - The hi-fi prototype will include most if not all of the content on the final design.
- - Hi-fi prototypes are incredibly realistic in their interactions.



Promoting health awareness with a "know your numbers" card & system

Prototype of what an iPod might look like with a larger resolution
iPod
9:42 AM
2x
36,310
26

Low Vs High Fidelity prototypes

Type	Advantages	Disadvantages
Low-fidelity prototype	Lower development cost Evaluates multiple design concepts Useful communication device Addresses screen layout issues Useful for identifying market requirements Proof of concept	Limited error checking Poor detailed specification to code to Facilitator-driven Limited utility after requirements established Limited usefulness for usability tests Navigational and flow limitations
High-fidelity prototype	Complete functionality Fully interactive User-driven Clearly defines navigational scheme Use for exploration and test Look and feel of final product Serves as a living specification Marketing and sales tool	More resource-intensive to develop Time-consuming to create Inefficient for proof-of-concept designs Not effective for requirements gathering

Table 11.3 Advantages and disadvantages of low- and high-fidelity prototypes

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. Product needs engineering

Metaphor

- A metaphor is **a figure of speech that describes an object or action in a way that isn't literally true, but helps explain an idea or make a comparison**

Is there a suitable metaphor?

- Interface metaphors combine familiar knowledge with new knowledge in a way that will help the user understand the product.

- **Refer to one thing by mentioning another**

- Conceptualizing what we are doing, e.g. surfing the web
- A conceptual model instantiated at the interface, e.g. the desktop metaphor

Metaphor Example - Desktop

- Clipboard
- Recycle bin
- Trash
- File cabinet
- Calendar
- Clock
- Messages

Explore the user's experience (UX)

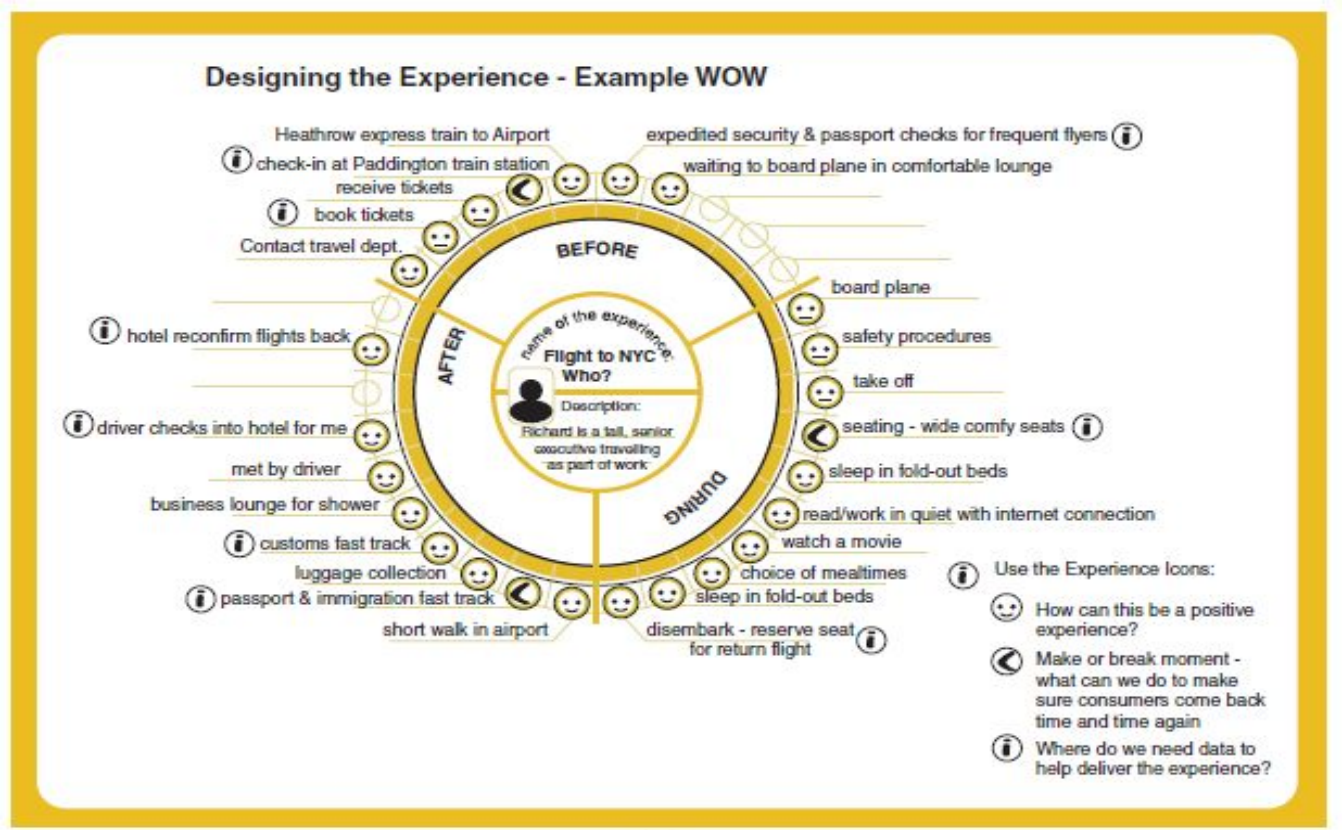
- Use personas, card-based prototypes or stickies to model the user experience
- Visual representation called:
  - design map
  - customer/user journey map
  - experience map
- Two common representations
  - wheel
  - timeline

Signs category	Sample A	Sample B	Sample C
1-Icon			
2-Index			
3-Symbol			

Generate card-based prototype from use case

Figure 11.6 Prototype developed for cell phone user interface

An experience map drawn as a wheel

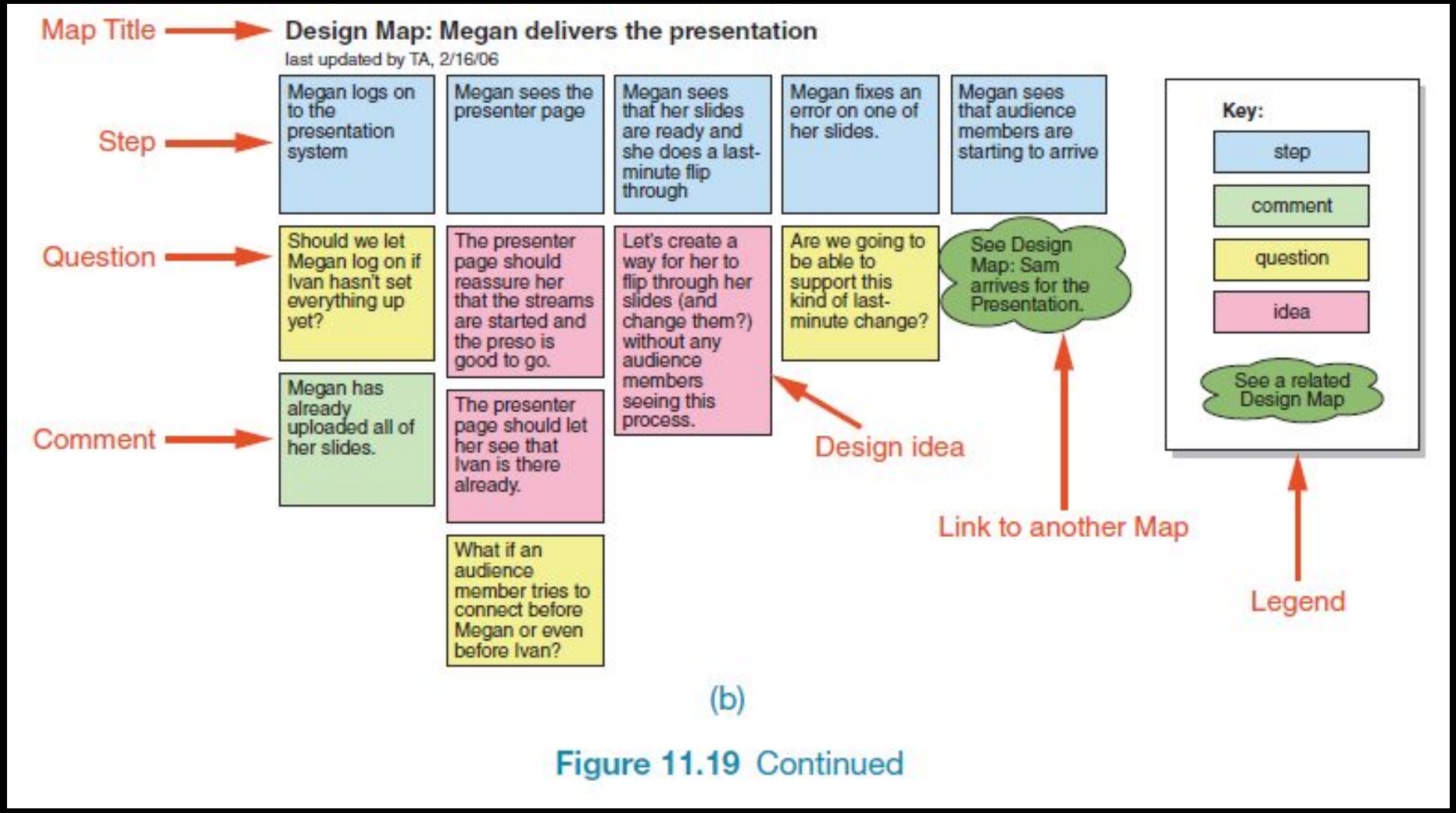


(a)

Figure 11.19 (a) An experience map using a wheel representation. (b) An example timeline design map illustrating how to capture different issues.

Source: (a) http://www.ux-lady.com/experience-maps-user-journey-and-more-exp-map-layout/ (b) Adlin, T. and Pruitt, J. (2010) *The Essential Persona Lifecycle: Your guide to building and using personas*. Morgan Kaufmann p. 134.

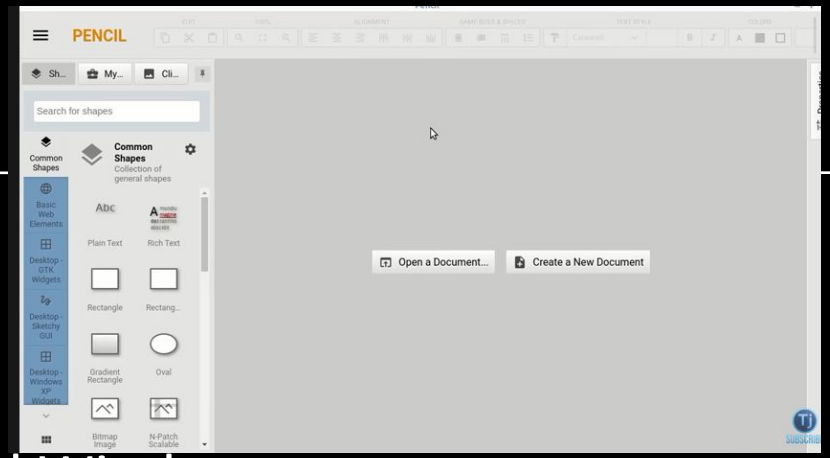
An experience map drawn as a timeline



(b)

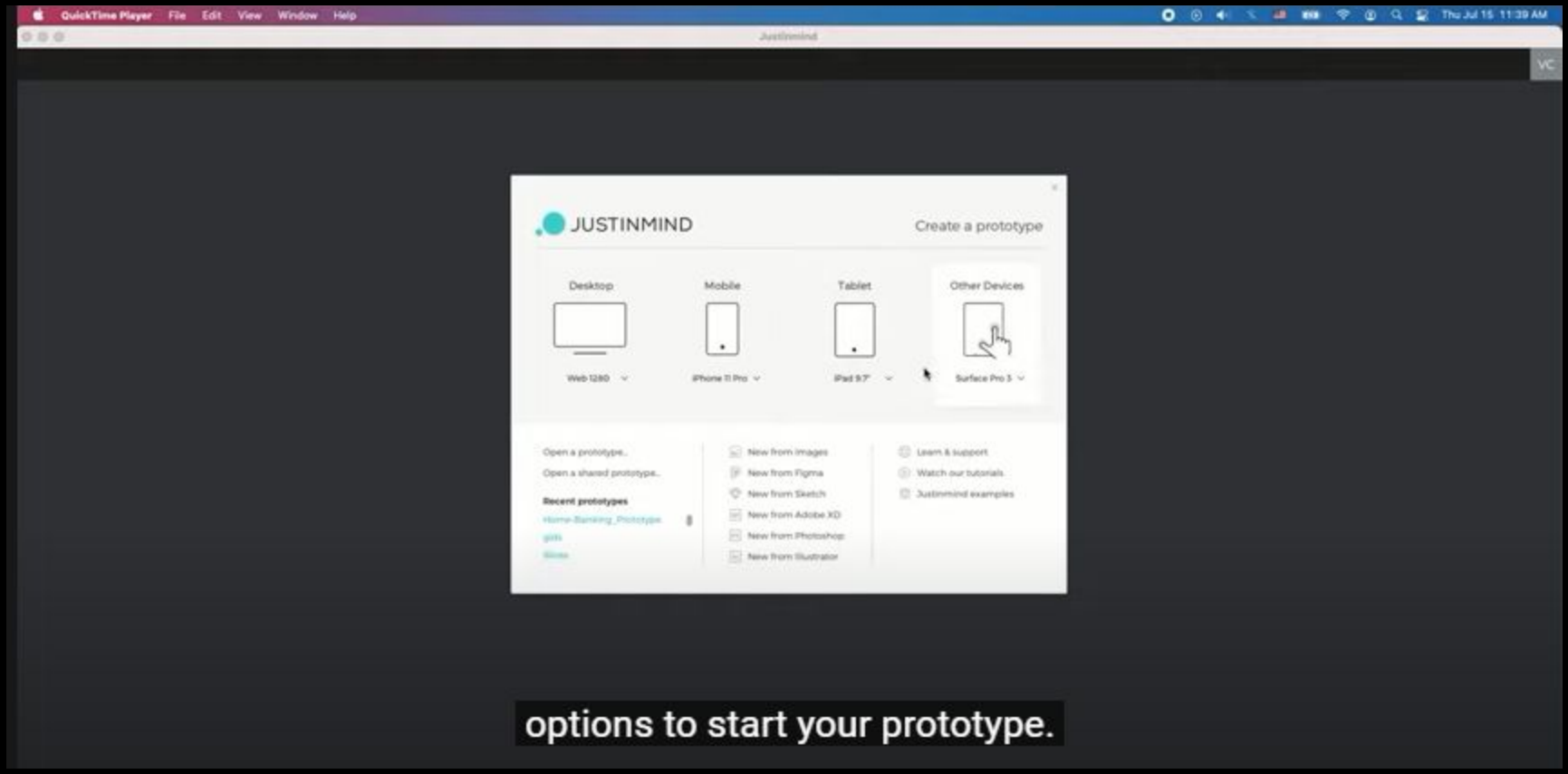
Figure 11.19 Continued

GUI Prototyping Tools



- Pencil Project :
  - http://pencil.evolus.vn/
  - supports Linux, Mac OS X and Windows.
  - A Firefox add-on is also available
  - Free
- Smartdraw
  - https://www.smartdraw.com/
  - $200

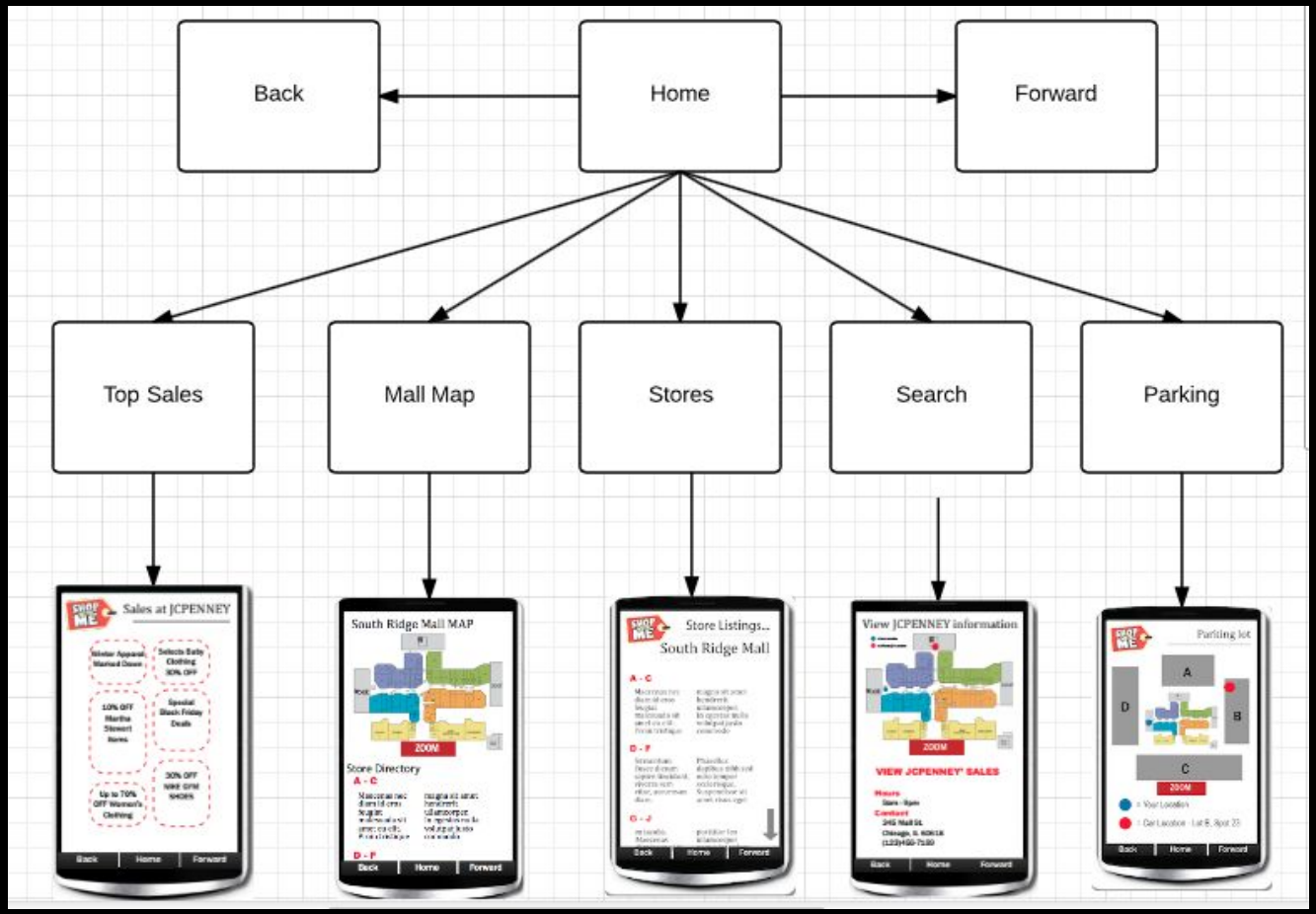
Just in mind

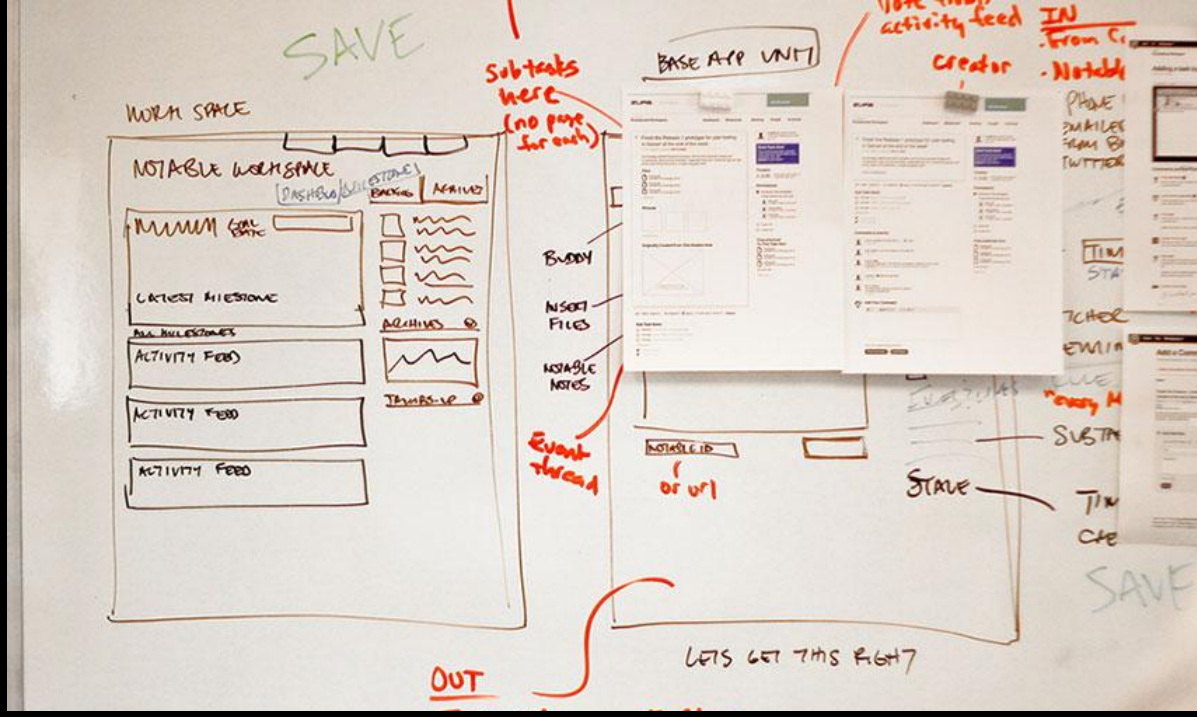
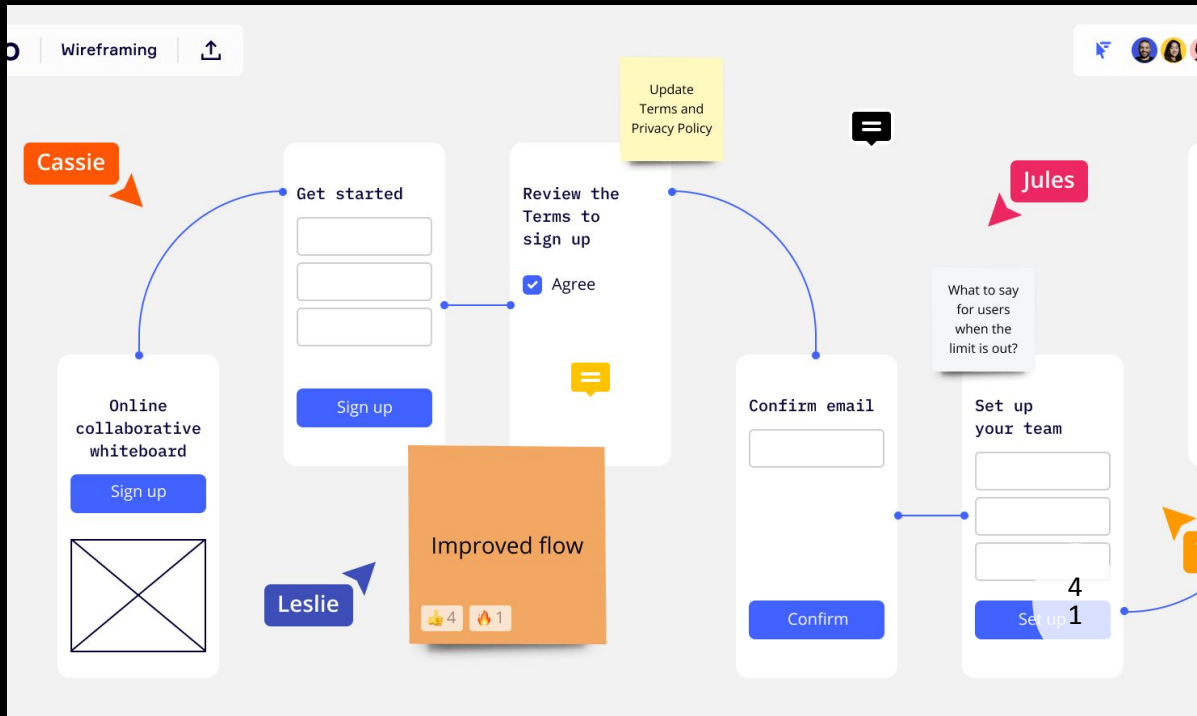

QuickTime Player File Edit View Window Help
Thu Jul 15 11:39 AM
Justinmind
JUSTINMIND
Create a prototype
Desktop
Mobile
Tablet
Other Devices
Web 1280
iPhone 11 Pro
iPad 9.7"
Surface Pro 3
Open a prototype...
Open a shared prototype...
Recent prototypes
New from images
New from Figma
New from Sketch
New from Adobe XD
New from Photoshop
New from Illustrator
Learn & support
Watch our tutorials
Justinmind examples
options to start your prototype.

Story boards and mood Board

- A **Moodboard** is a collage of images, text, and samples of objects. It can use references from other artists, movies, and images from the real world to convey color, design, or emotion.
- A **Storyboard** is a pre-visualization of a motion picture, animation, or other media represented by a series of still images.

Navigation maps



Wire frames

- Wireframing is **a process where designers draw overviews of interactive products to establish the structure and flow of possible design solutions**.