



arstechnica.com/apple/2013/03/exclusive-super-early-iphone-prototype-had-5x7-screen-serial-port/

Unit 5.4

Prototyping

Interfaces Persona Computador
Depto. Sistemas Informáticos y Computación. UPV

Unit Goals

- ▶ Know what a prototype is
- ▶ Understand the need for prototyping any complex system before building it
- ▶ Learn about the different types of prototyping techniques used in HCI and their characteristics



Overview

- ▶ Introduction
- ▶ Motivation
- ▶ Low Fidelity Prototypes
- ▶ Low to Medium Fidelity Prototypes
- ▶ High Fidelity Prototypes
- ▶ Video Prototypes
- ▶ Evaluating Prototypes
- ▶ References



Introduction

- ▶ A prototype is a first or early example that is used as a model for what comes later



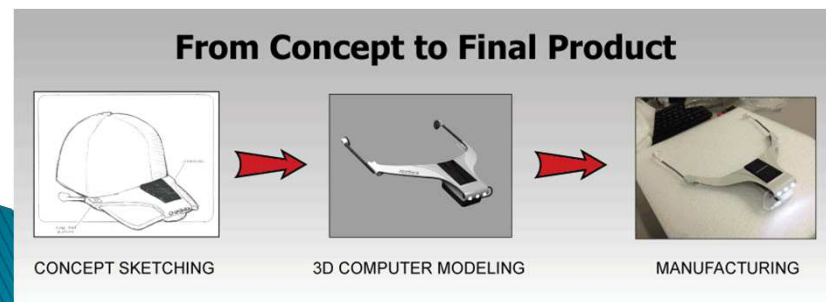
www.motorauthority.com/news/1085011_what-ever-happened-to-lexus-lfa-gte-race-car



botcrawl.com/guggenheim-architect-to-design-new-facebook-tree-topped-engineering-building-prototype-gallery/



words.usask.ca/news/2012/02/29/space-design-team-unveils-nanosatellite-prototype/



globerdesign.com/hattrick-the-ultimate-invention-for-caps/



makerbot.com

Motivation

- ▶ Prototyping encourages the exploration of multiple options, and allows designers to easily evolve, demonstrate and evaluate designs
- ▶ It helps developers to focus on the design, and not on the implementation details
- ▶ Prototypes are almost always incomplete, easy to change and are thrown away when not needed
- ▶ There are several types of prototypes that provide different levels of fidelity
 - Each type is appropriate for a stage in the development process
- ▶ From low to high fidelity:
 - Storyboards, paper prototypes, digital mockups, dynamic prototypes



Motivation



boeingimages.com/archive/747SP-Mock-Up-Upper-Deck-Interior-2F3XC5W0MP1.html

“Prototyping is a strategy for efficiently dealing with things that are hard to predict.”

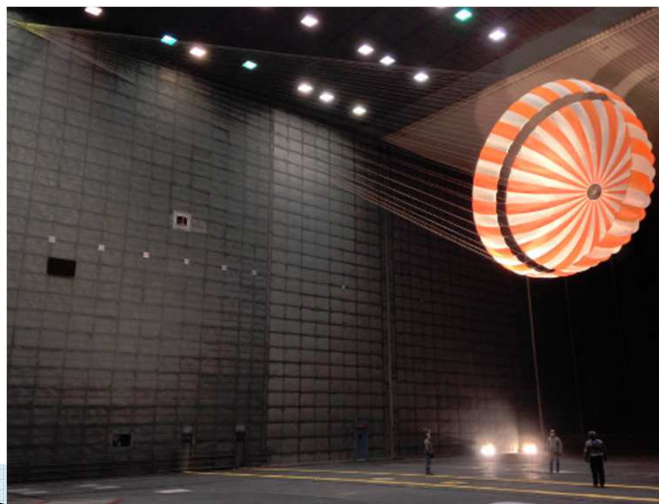
Scott Klemmer



Prototype of the first digital camera (Ideo for Kodak)



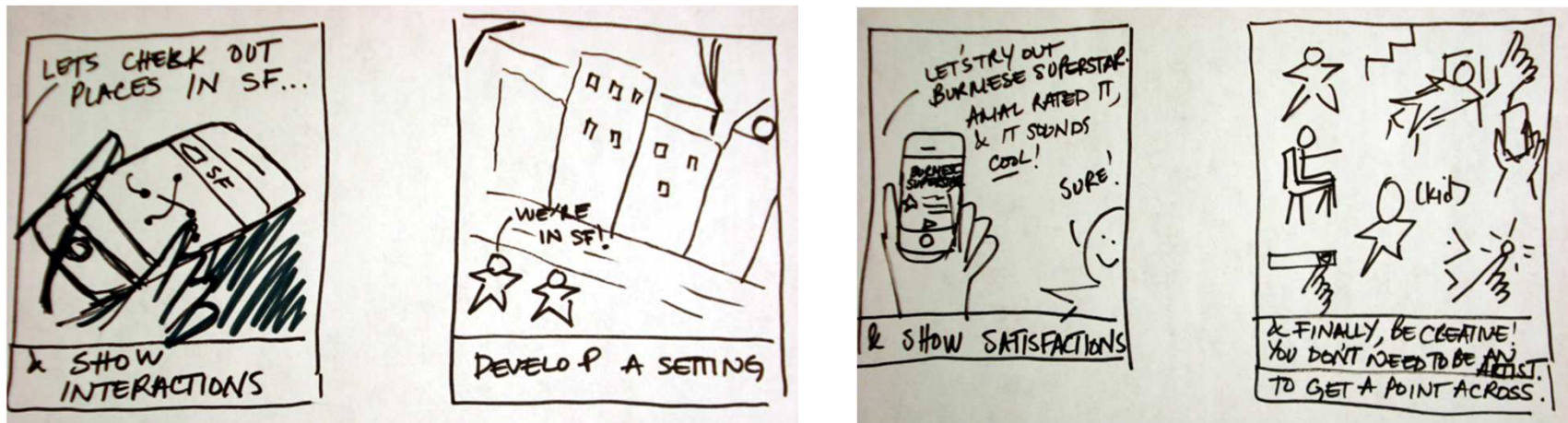
rockfishdigital.com/blog/photos-from-our-visit-to-ideo



nasa.gov/jpl/pia19405/parachute-testing-for-nasas-insight-mission

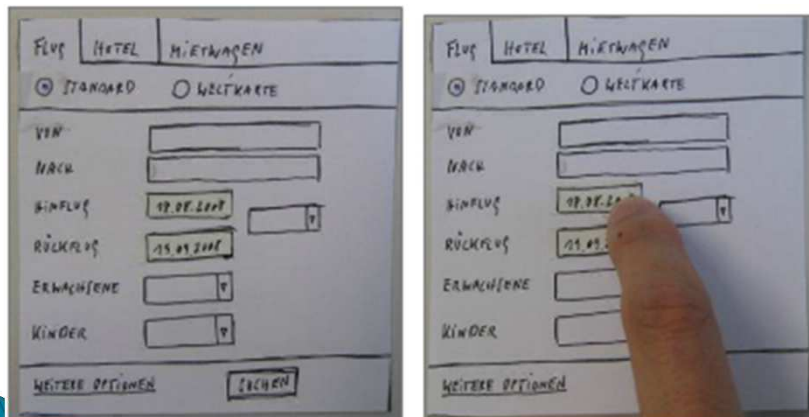
Low Fidelity Prototypes

- ▶ Storyboards
 - Focus on the tasks, rather than in the interface
 - Used during the requirement analysis stage

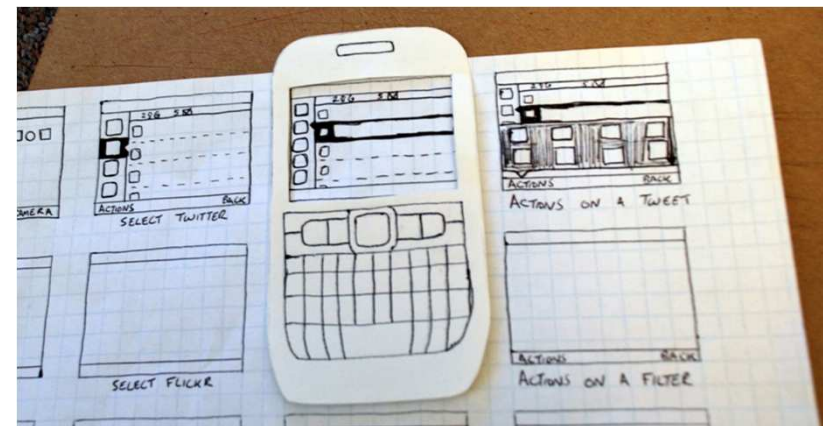


Low Fidelity Prototypes

- ▶ Paper prototyping
 - We start designing the actual user interface
 - Draw a mockup of the actual user interface in paper
 - Using paper, post-it notes and markers, instead of using a computer program, avoids trying to get the design beautiful and exact
 - Users can get involved in the evaluation and evolution of the design



slideshare.net/memmel/user-interface-prototyping



chiefdisruptionofficer.com/helpful-rapid-prototyping-methods-and-tools-to-bring-digital-ideas-to-life-fast/

Low Fidelity Prototypes

- ▶ Paper prototyping guidelines
 - Keep all the materials in one place, and have different types (paper, cardboard, transparencies, tape, glue, pens, markers...)
 - Work quickly and make reusable components
 - If something is difficult to simulate (animations, right mouse menus...) describe the interaction verbally
 - Large poster boards can be useful to contain the prototype and provide context for the user
 - Mix and match hardware and software, and different fidelities (e.g., a print out of a photograph of a device)
 - If appropriate, add context by including familiar operating system elements



Low Fidelity Prototypes

- ▶ More examples

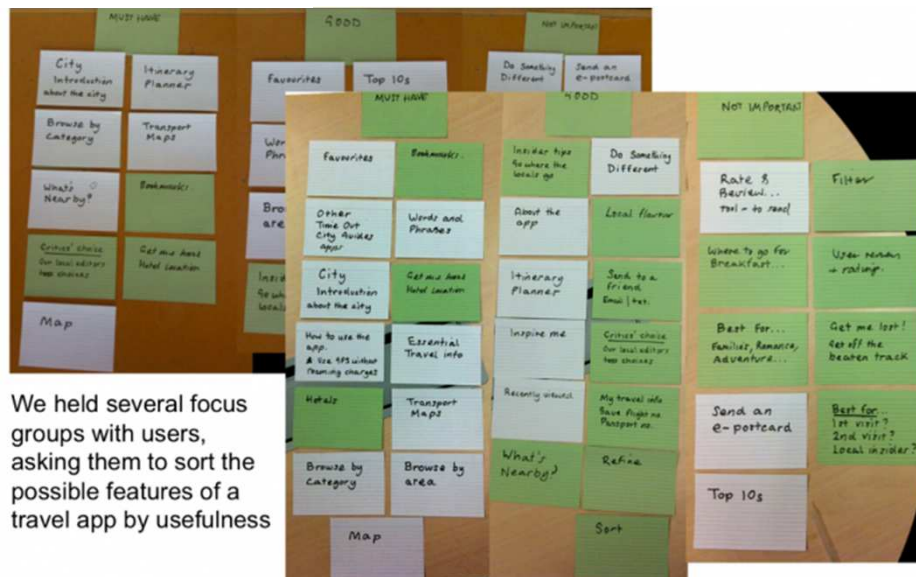


<https://www.youtube.com/watch?v=J-bVzUahNlg>

Low Fidelity Prototypes

- ▶ Paper prototypes are also used during the requirement analysis phase

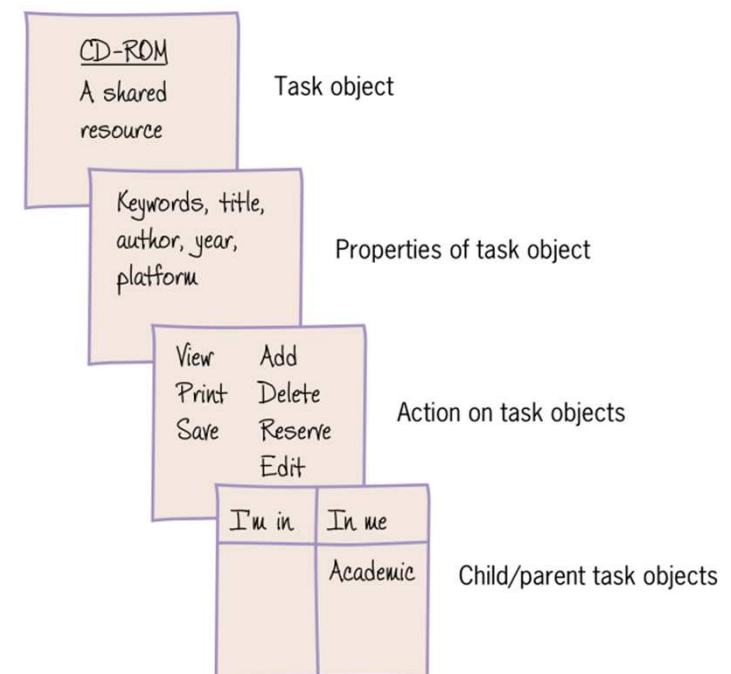
Card Sorting



We held several focus groups with users, asking them to sort the possible features of a travel app by usefulness

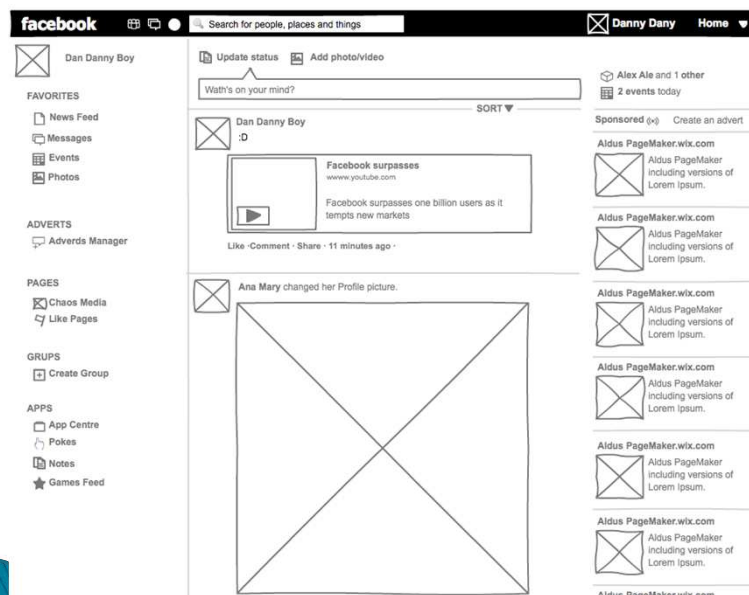
grahamtodman.co.uk/blog/2012/04/time-out-travel-app-card-sorting-exercise

Defining the Task object, properties, actions and child objects during Conceptual Design

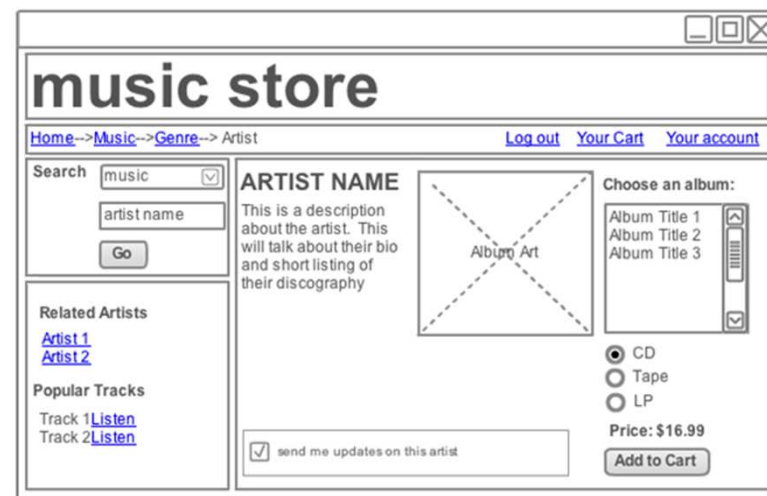


Low to Medium Fidelity Prototypes

- ▶ Wireframe (or page schematic or screen blueprint)
 - Typically used in web design, but also applicable to mobile or desktop
 - It shows the page layout, but no typographic style, color or graphics
 - The focus is on functionality, behavior and priority of content
 - Connects the underlying conceptual structure to the visual design



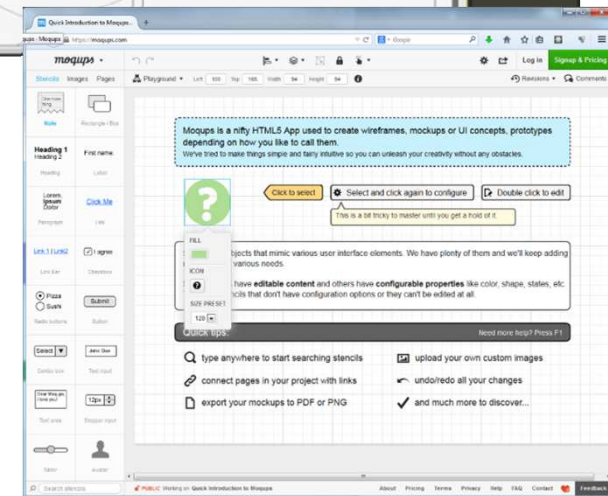
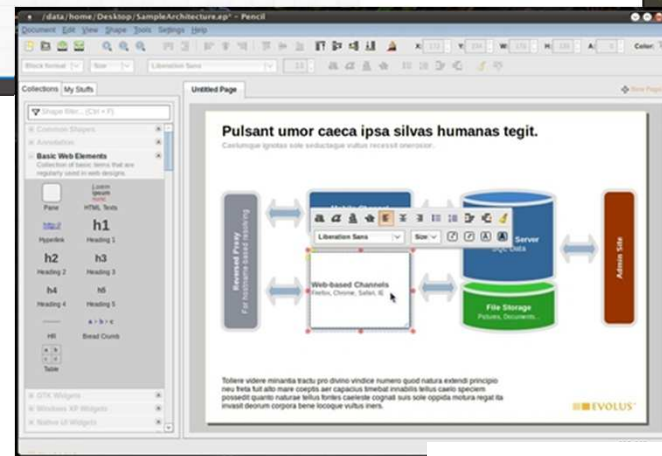
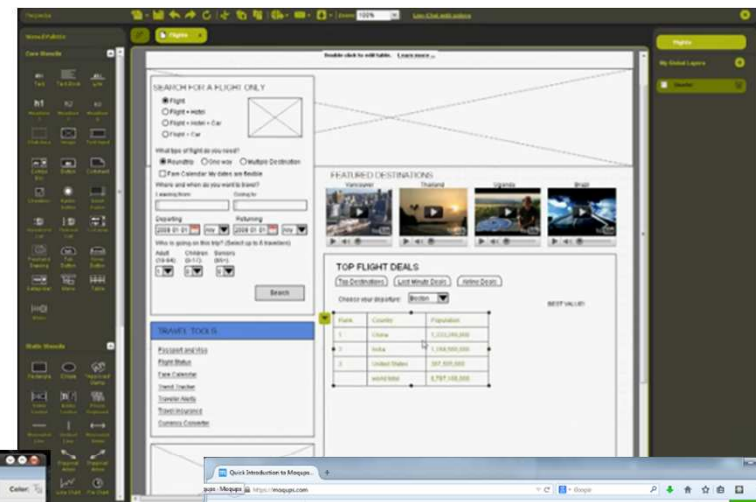
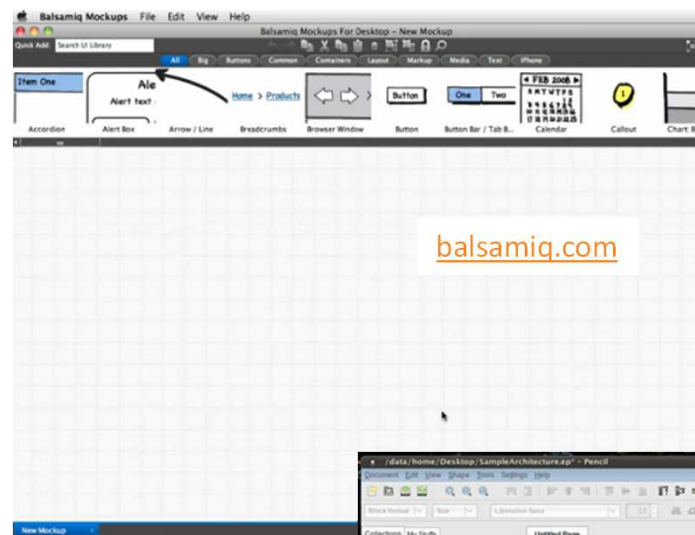
flairbuilder.com



open-tube.com/7-free-tools-to-create-wireframes-and-prototypes-easily

Low to Medium Fidelity Prototypes

Tools for creating sketches and wireframes



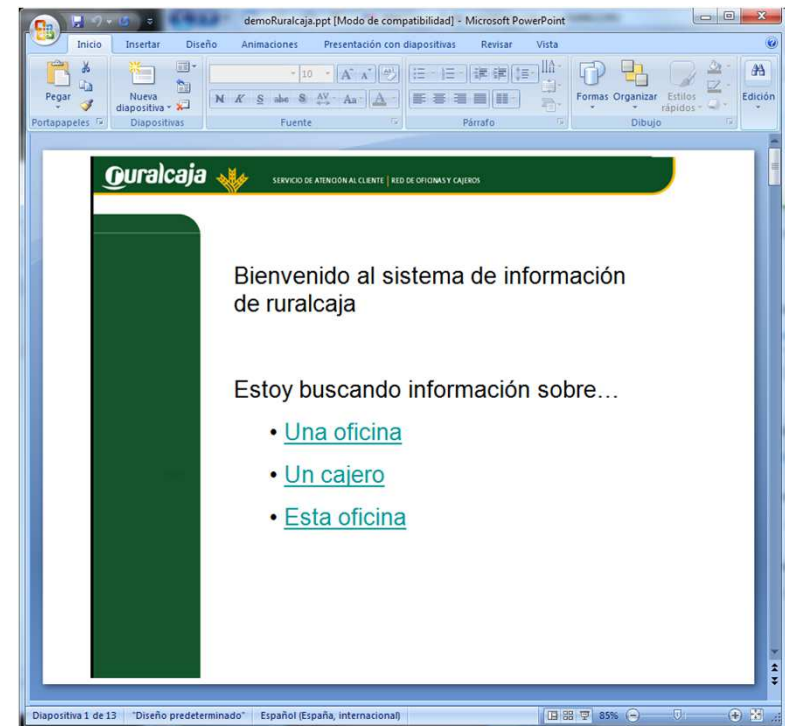
More tools: http://en.wikipedia.org/wiki/Comparison_of_software_prototyping_tools

High Fidelity Prototypes

- ▶ Digital mockups
 - More detailed approaches to the final design
 - They allow for more formal evaluation

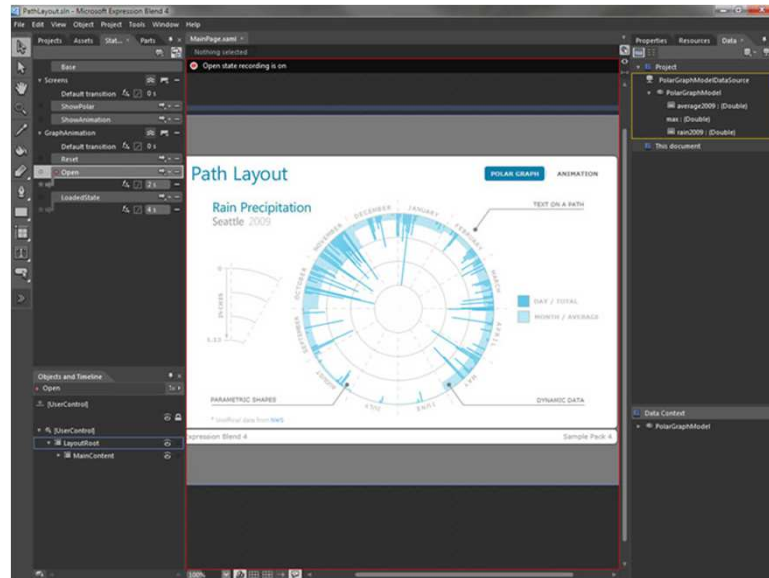


nspacinc.wordpress.com/2011/04/20/meet-n-space-art-directors/ui_tron_mockups/



High Fidelity Prototypes

Tools for Building High-fidelity prototypes

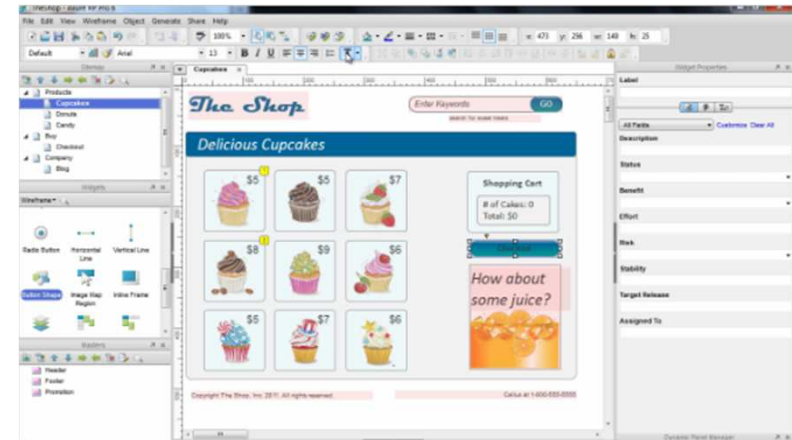


Microsoft Blend

<http://www.youtube.com/watch?v=w6hZpst9INs>

<http://www.microsoft.com/expression>

Axure



<http://www.axure.com>

High Fidelity Prototypes

- ▶ High-fidelity prototypes of Windows 7's desktop design



<http://channel9.msdn.com/Events/MIX/MIX09/C26F>

Video Prototypes

- ▶ Video prototyping
 - Cheap and fast to make
 - It is a great communication tool
 - Show context, it is portable and self-explanatory
 - Ties interface decisions to tasks
 - Helps to orient the interface choices, makes sure you think of a complete interface, and helps to detect unnecessary elements
 - It can be used at any stage of the process



Video Prototypes

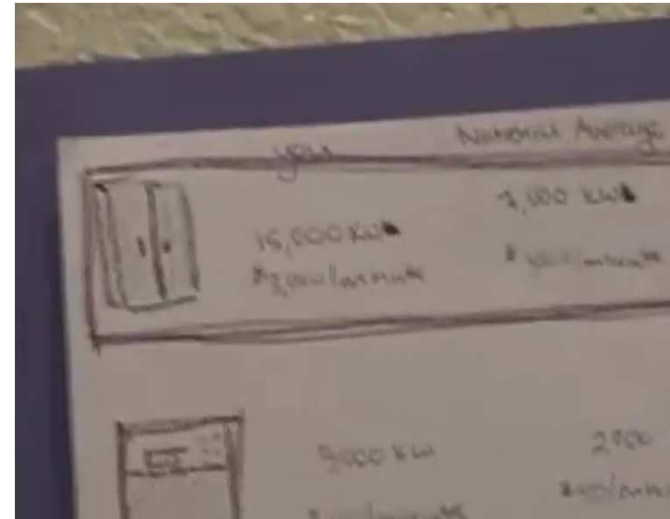
- ▶ What should the video show?
 - Whole task, including motivation and success
 - Illustrate the most important tasks
 - The tasks that are not important enough to appear in the video, probably don't need to go in the first version of the system
- ▶ How to make it?
 - Start with an outline
 - It is OK to start recording to see what happens
 - The camera is not important (camera phone are OK)
 - Find people and realistic location
 - Remember that the important thing in the message, not the production quality of the video

Video Prototypes

► Considerations

- Use audio or a silent movie with subtitles
- Interface can be paper, mock-ups, code or invisible
- Can show both success and failure
- Edit as little as possible, because editing is very time-consuming

► Examples



<https://class.coursera.org/hciucsd-005/lecture/24>

Evaluating Prototypes

The Wizard of Oz

- ▶ Problem: in order to get feedback on an interactive application from users, we need a working prototype
- ▶ The Wizard of Oz technique allows us to evaluate user interaction with early prototypes
- ▶ There is a human operator that moves the interactive elements on behalf of the application
 - Therefore, there is little or no code written
- ▶ Allows testing the user interaction using a technology that still does not exists
- ▶ It makes sense if it is faster to develop than the real thing



Evaluating Prototypes

The Wizard of Oz

- ▶ Wizard of Oz example



<https://www.prhlt.upv.es/showcase/htr> link "Interactive desktop"

Evaluating Prototypes

The Wizard of Oz

► Challenges

- High fidelity interfaces that “work” may make the user think that the development is done
- High fidelity interfaces make it harder to users to give a strong critique
- It is easy to prototype something that can’t be built
 - For example, a perfect voice recognition system. Be realistic and include some kind of error correcting strategy
- If you want your users to believe it is a real system, you will have to build some kind of remote control, that allows the wizard to be hidden



References

- ▶ Scott Klemmer. Human-Computer Interaction course
 - <https://class.coursera.org/hciucsd-005/lecture/preview>
 - Week 1. Introduction
 - Video 2. The Power of Prototyping
 - Week 3. Rapid Prototyping.
 - Video 1. Storyboards, Paper Prototypes and Mockups
 - Video 2. Faking it – Wizard of Oz
 - Video 3. Faking it – Video prototyping

