Prototyping

Introduzione all'usabilità nelle interfacce web

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The goal

- **Envisionment**: making ideas visible
  - Generating new ideas
  - Evaluating new ideas (within the design group)
  - Testing new ideas (with users)
- Different tools and techniques, according to
  - The stage of design (early, …, advanced, final)
  - The intended audience (designers, test users, clients, management, …)
- **Error to avoid**: focusing on the user interface before focusing on the task that the user has to accomplish

The method

- Techniques to **explore** different design **alternatives**
- Explore
  - Flows of action
  - Devices and their roles
  - Interfaces
- Alternatives
  - More than one possible design
  - Impossible to get it right the first time
  - Find the best possible solution

Storyboards

Comic book – like representation of user scenarios, with emphasis of how the system supports users in the development of the task

Storyboard

- «A graphical depiction of the outward appearance of the intended system, without any accompanying system functionality»
- A hand-drawn comic that features the execution of a task (like a concrete scenario)
- With a few panels (sequence of sketches) it conveys what a person may accomplish
  - Always include people
- They communicate **flow**, showing what happens **at key points** in time
- No artistic skills are required
  - Not about “nice pictures”
  - About communicating ideas

What to find in a storyboard

- Illustrate a goal (for the task)
- How a task unfolds (people interacting among themselves and with devices)
  - Repeated for all significant steps
- At the end, how they accomplish their goals (satisfactory outcome)

- Storyboards are **all about tasks**

Example

This storyboard illustrates how the app can show the user that a home cooked meal can be quicker than ordering food delivery, using left over ingredients in the fridge.

http://alexmevissen.com/2014/07/16/storyboarding/

Storyboards should convey

- Setting
  - People involved
  - Environment
  - Task being accomplished
- Sequence
  - What steps are involved?
    - Not the detailed UI
    - What role the UI plays in helping users achieve their goal?
  - What leads someone to use the system?
    - The “trigger” for the task
  - What task is being illustrated?
- Satisfaction
  - What’s the motivation for the user?
    - The end point to reach after all the steps
  - What’s the end result?
  - What need are you “satisfying”?

Benefits of Storyboards

- Emphasize how an interface accomplishes a task
- Focus the conversation and feedback on user tasks
- Get everyone on same page about the app's goals
- Avoid nitpicking about user interface details (buttons etc)

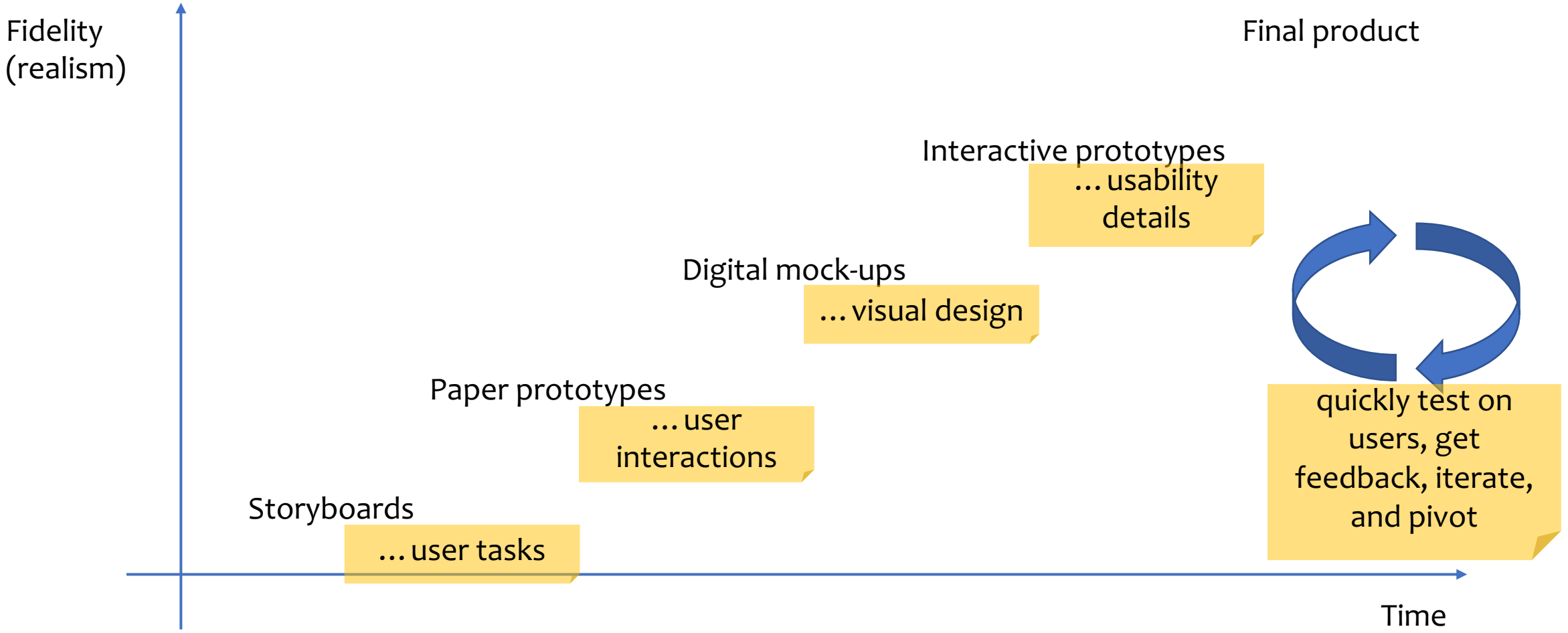
Prototypes

Tangible approximations, at various levels, of system behavior and appearance, to cheaply and quickly evaluate and explore design decisions

Prototypes

- «A prototype is a concrete but partial representation or implementation of a system design»
- «An easily modified and extensible model (representation, simulation or demonstration) of a planned software system, likely including its interface and input/output functionality»
- One of the most powerful tools for design exploration, visualization, and testing
- They let us ‘see’ and ‘feel’ interactivity (simulated or real)

Prototypes facilitate conversations about…

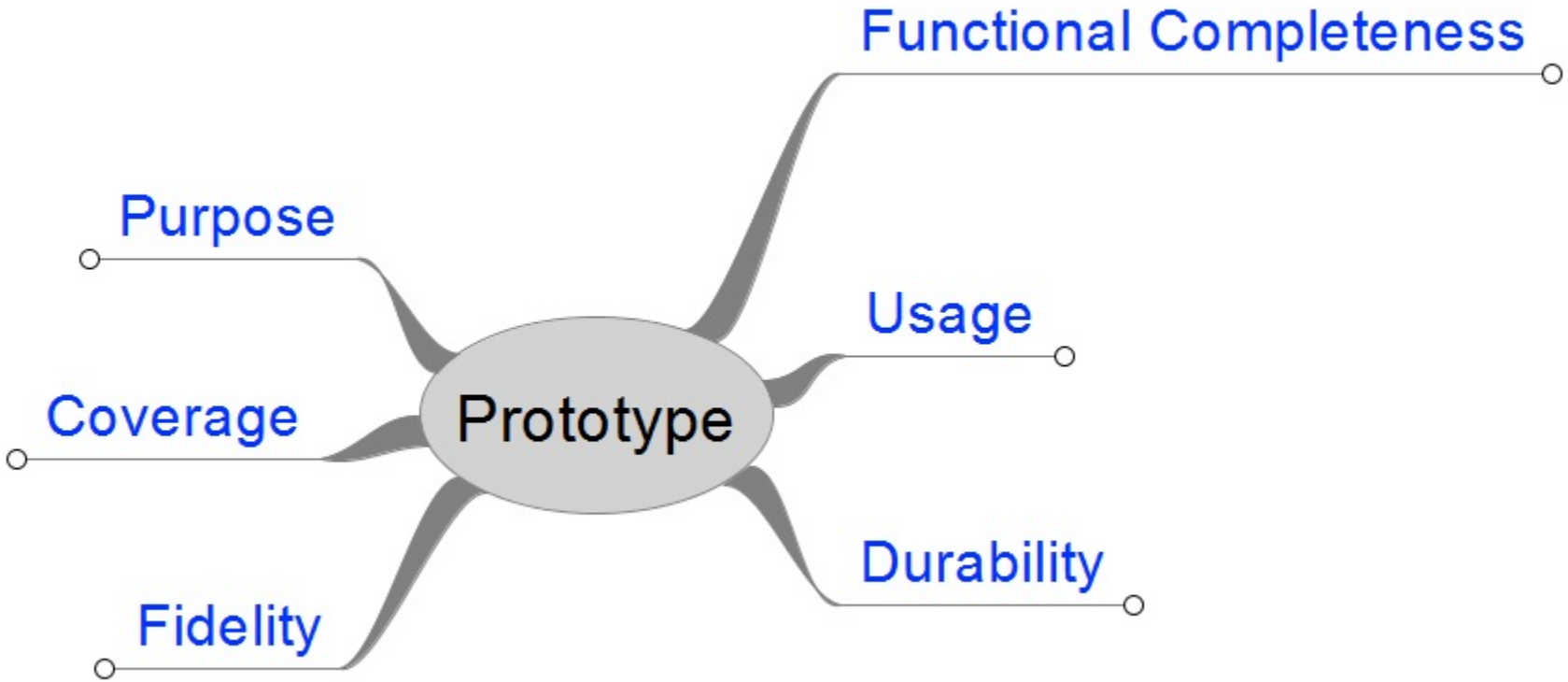


Prototypes

What

- Paper designs
- Video prototypes
- Wizard-of-Oz
- Mockups
  - Low-fidelity
  - High-fidelity
- Preliminary versions

Characteristics of Prototypes

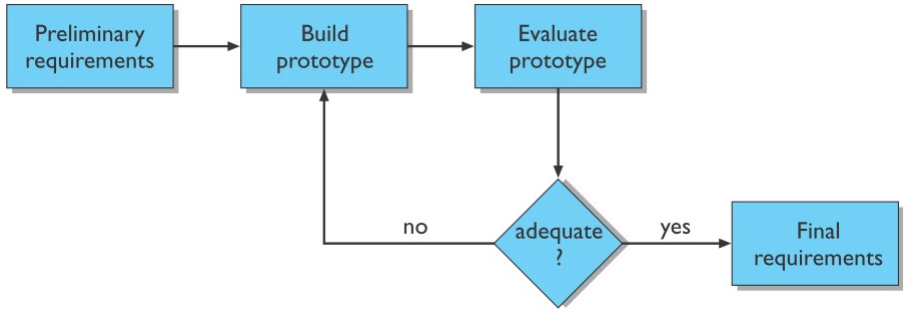


Possible purposes for a prototype

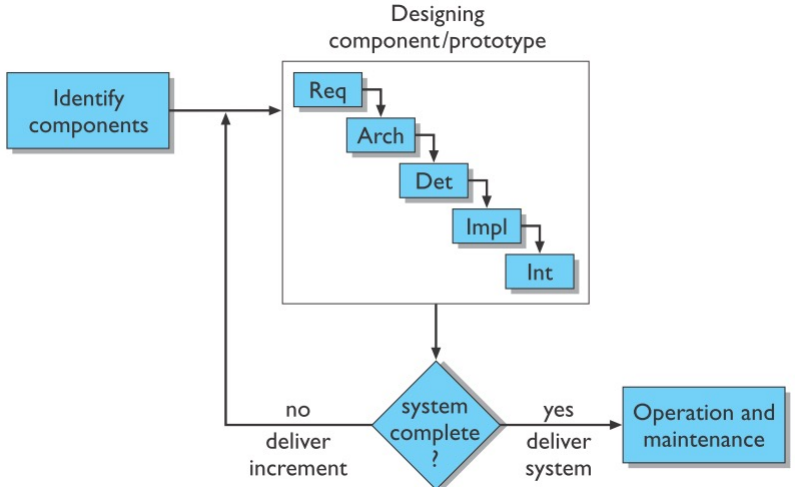
- Expert analysis
- Check with design rules and guidelines
- Involve users in a controlled experiment
- Involve users “in the wild”
- …

Durability (1)

- **Throw-away prototype:** used to assess some qualities of the system (gain knowledge), then discarded

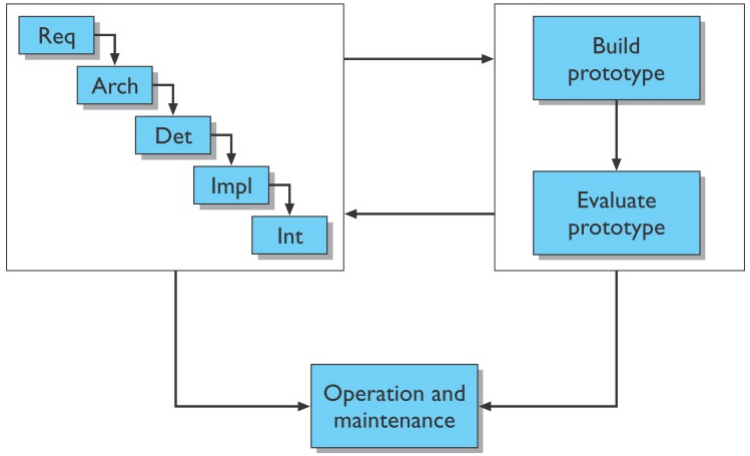


- **Incremental prototype:** the system is developed as incremental modules, each of them released in a separate step

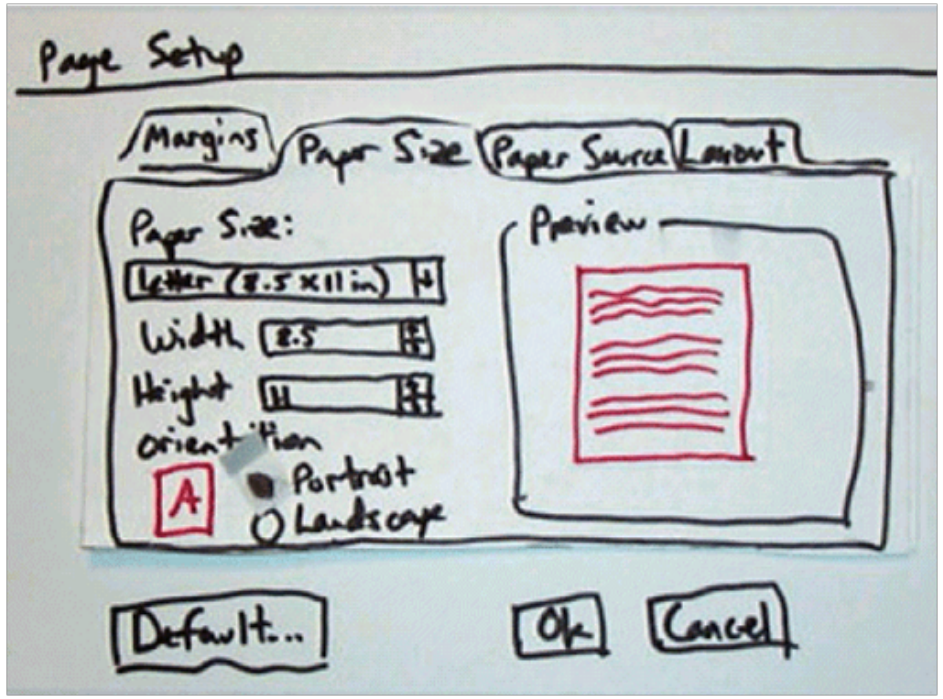


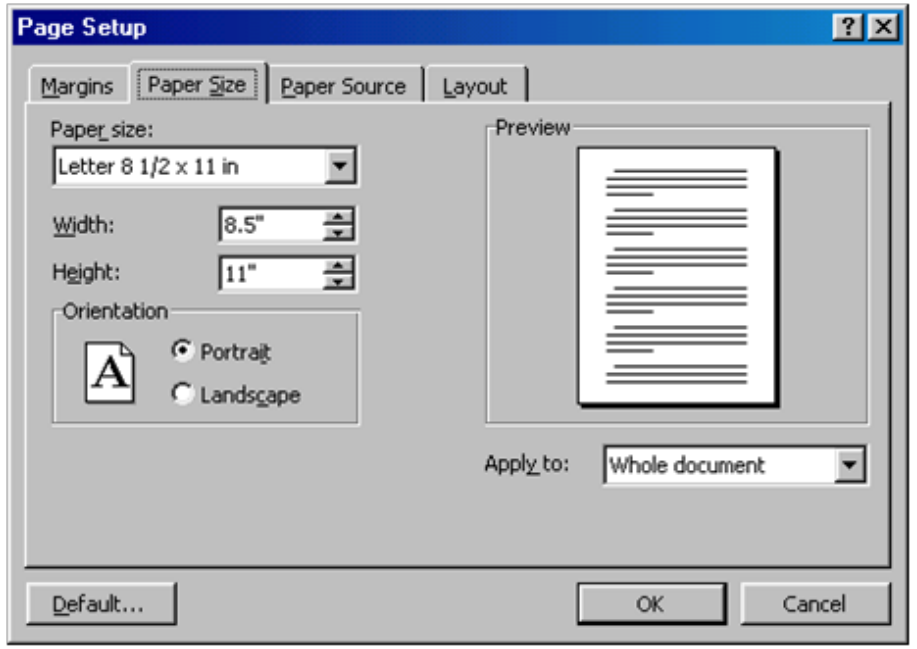
Durability (2)

- **Evolutionary prototype:** the prototype *becomes* the product; each product iteration builds upon the previous one



Fidelity: different information is conveyed





Paper prototypes

How to start using an application, months before implementing it

Paper prototypes

- A hand-drawn mock-up of the user interface (usually) on multiple sheets of paper of varying sizes

Key features for Paper Prototypes

- Interactive paper mockup
  - Sketches of screen appearance
  - Paper pieces show windows, menus, dialog boxes
- Interaction is natural
  - Pointing with a finger = mouse click
  - Writing = typing
- A person simulates the computer's operation
  - Putting down & picking up pieces
  - Writing responses on the "screen"
  - Describing effects that are hard to show on paper
- Low fidelity in look & feel
- High fidelity in depth (person simulates the backend)

http://web.mit.edu/6.813/www/sp18/classes/11-prototyping/

Materials

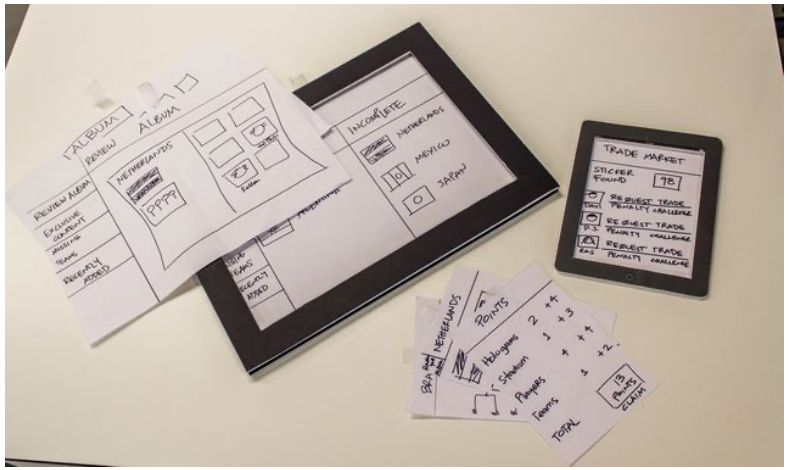
- Paper, Transparent paper
- Pens, Markers
- Post-It notes
- Glues, scotch tape, scissors
- Photocopies
- UI Stencils
- Reusable UI components
- Printouts of screenshots

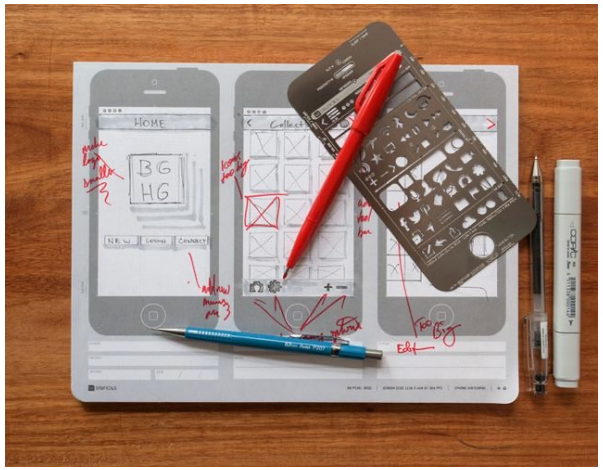
Why Paper Prototyping?

- Faster to build
  - Sketching is faster than programming
- Easier to change
  - Easy to make changes between user tests, or even **during** a user test
  - No code investment - everything will be thrown away (except the design)
- Focuses attention on big picture
  - Designer doesn't waste time on details
  - Customer makes more creative suggestions, not nitpicking
- Nonprogrammers can help
  - Only kindergarten skills are required

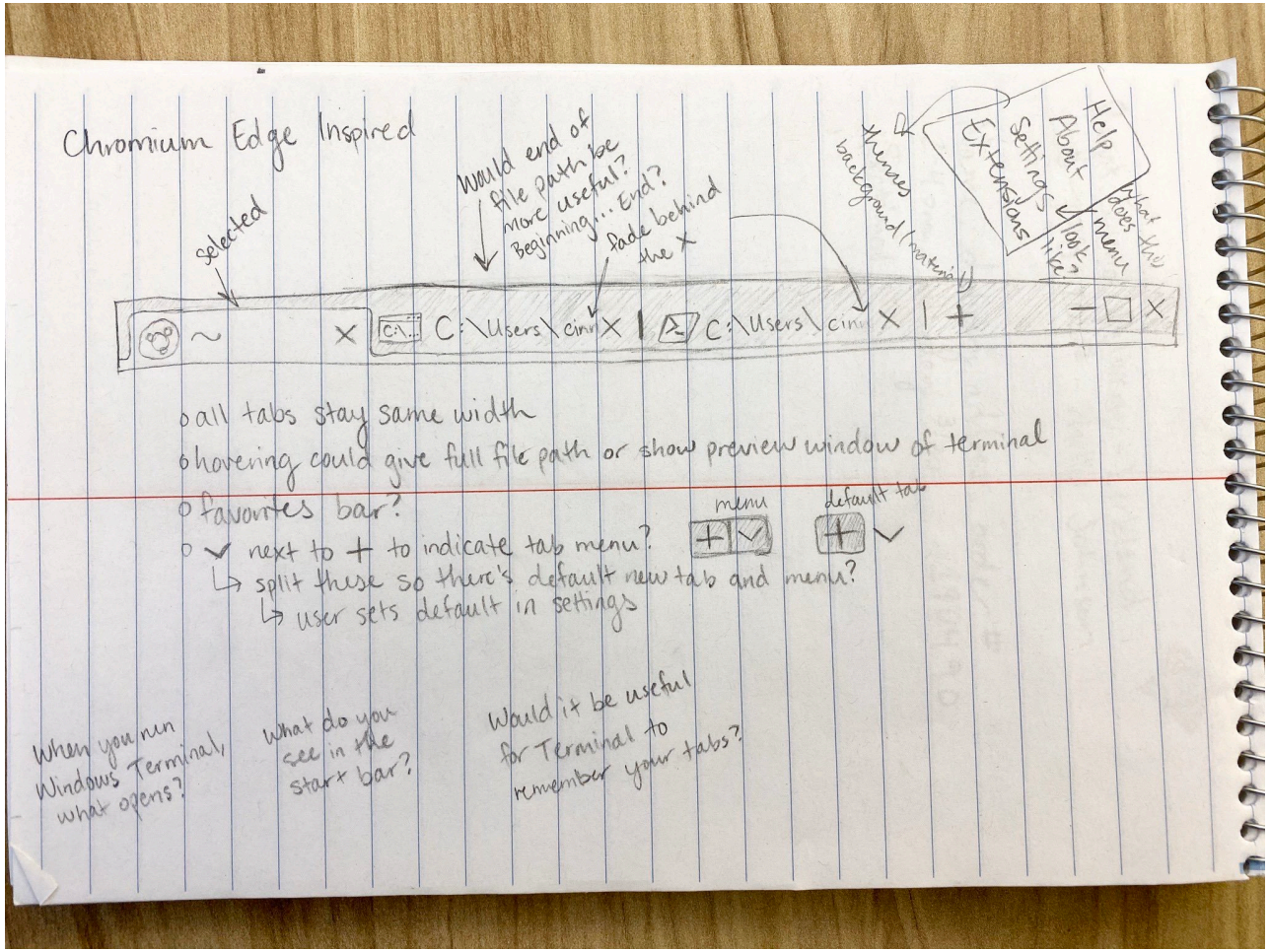
http://web.mit.edu/6.813/www/sp18/classes/11-prototyping/

Paper prototypes: examples





First ever mockup of the Windows Terminal tab bar

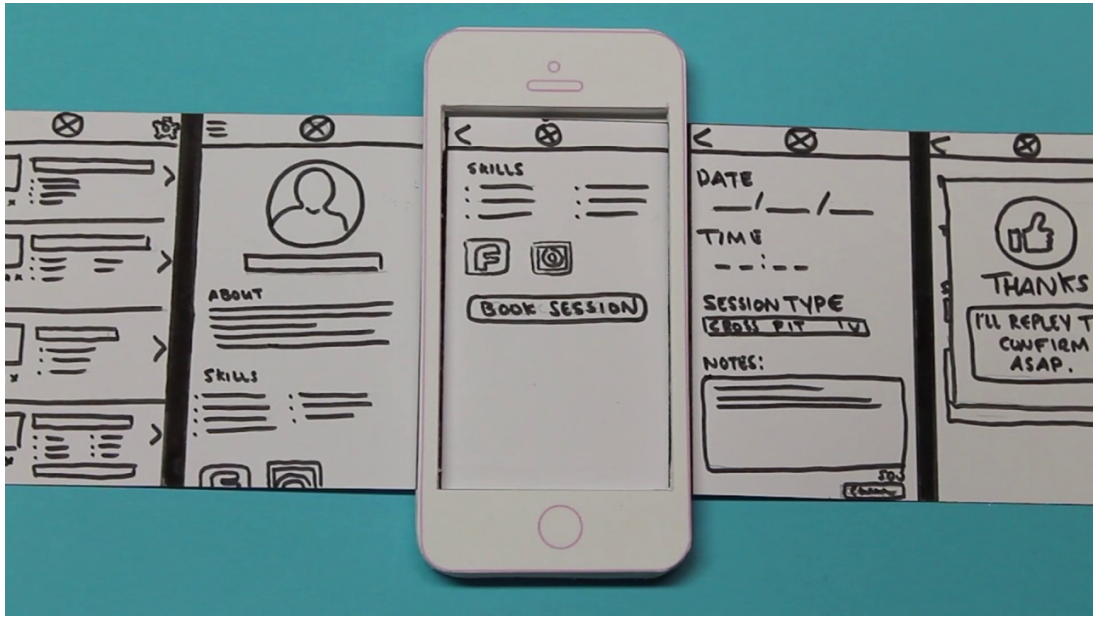


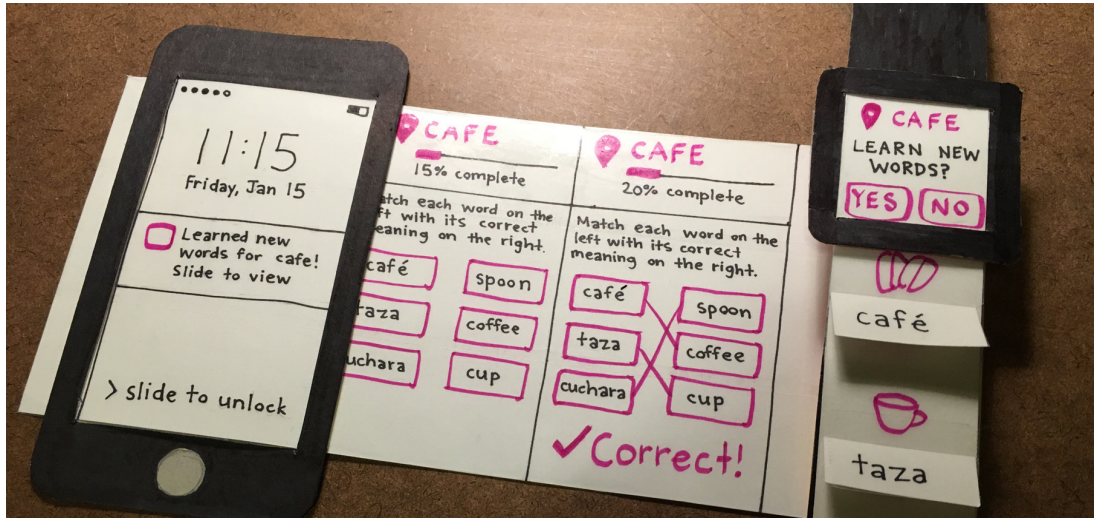
https://twitter.com/cinnamon_msft/status/1190015862201176065?s=20

Creating flows with paper prototypes

https://youtu.be/GrV2SZuRPv0

“Dynamic” Screens





How to Test a Paper Prototype

- The Design Team should cover these roles
- ‘Computer’ actor
  - Simulates prototype
  - Doesn’t give any feedback that the computer wouldn’t
- Facilitator
  - Presents interface and tasks to the user
  - Encourages user to **“think aloud”** by asking questions
  - Keeps user test from getting off track
- Observer
  - Keeps mouth shut
  - Takes copious notes

Learnable lessons from paper prototypes

Can Learn

- Conceptual model
  - Do users understand it?
- Functionality
  - Does it do what's needed? Missing features?
- Navigation & task flow
  - Can users find their way around?
  - Are information preconditions met?
- Terminology
  - Do users understand labels?
- Screen contents
  - What needs to go on the screen?

Can't Learn

- Look: color, font, whitespace, etc
- Feel: efficiency issues
- Response time
- Are small changes noticed?
  - Even the tiniest change to a paper prototype is clearly visible to user
- Exploration vs. deliberation
  - Users are more deliberate with a paper prototype; they don't explore or thrash as much

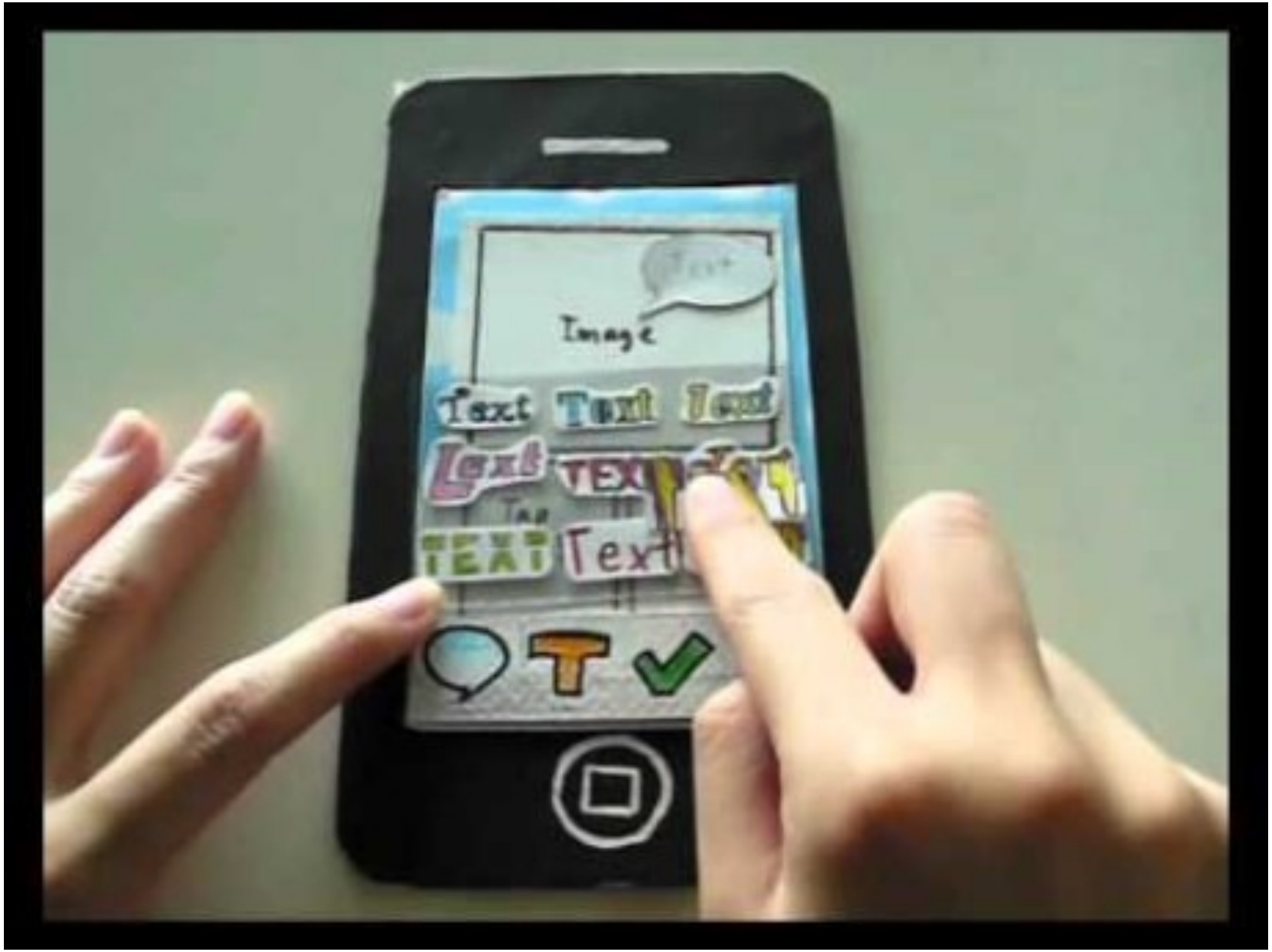
Video Prototypes

Sharing a rich experience of your prototype

Video Prototype

- A video that conveys your storyboard and/or paper prototype concepts.

Example



https://youtu.be/wbiYAqbZryA

Example

https://youtu.be/kWsBvUnvCmg

Video prototype fidelity

- Informal, low fidelity
  - Just for brainstorming
  - A few minutes to create
- Medium fidelity
  - Starting with paper prototype
  - One-two hours to create
- High fidelity
  - Need to get support from organization or client
  - Expensive

Required content

- Show the whole task (like a storyboard), including motivation and success
- Choose important tasks, that show cases when your system is performing really well
  - Tasks that you have observed
  - Key tasks in the application
- Defines the scope for an MVP: the shown tasks are the features of the first launch
- Defines the topics for the design team to ~~argue~~ discuss

Benefits

- Cheap and fast
- Can more vividly inspire people's imagination – Great communication tool
- Clean & self-explanatory – just share a YouTube link
  - More portable than a paper prototype!
  - Good for "pitching" or "selling" to management
- Shows context of use: helps achieve common ground
- Can serve as a 'spec' for developers
- Ties interface design to user tasks
  - Ensure you develop all that is needed, nothing extra

Medium Fidelity Prototypes

Wireframes, Powerpoints, Sketching tools

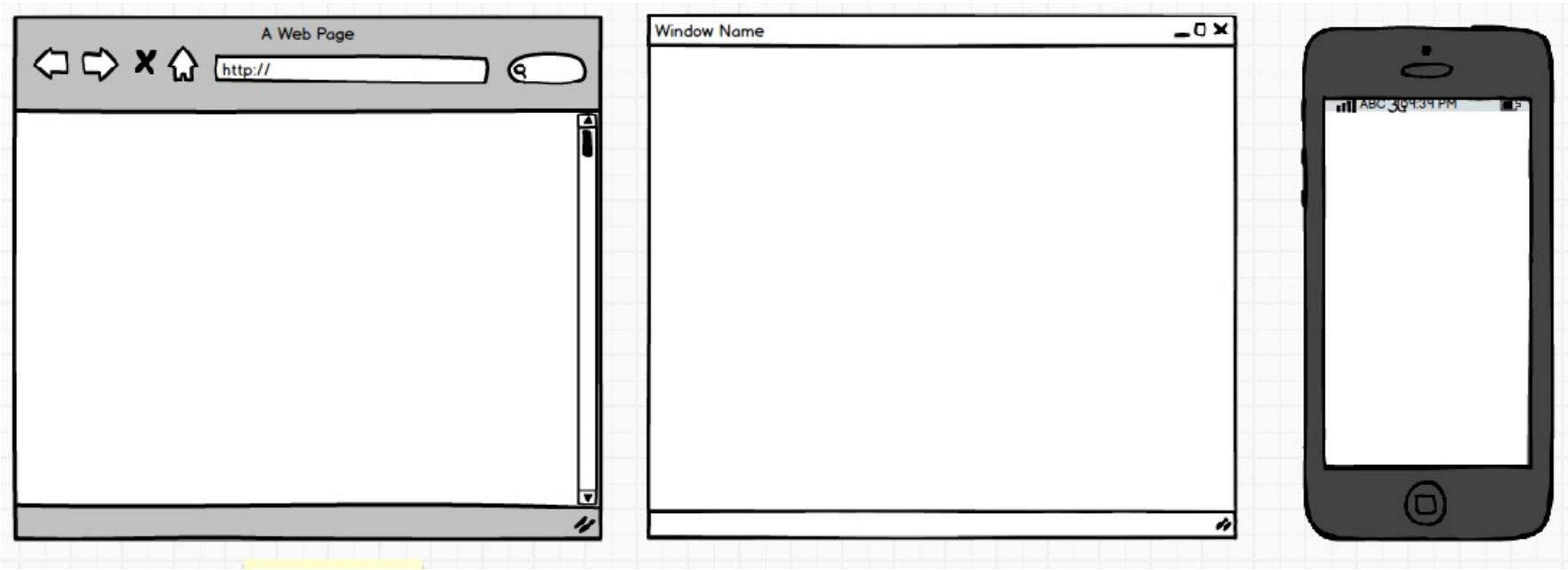
Computer prototypes

- Interactive software simulation
  - Renders user interface
  - Accepts some user input
  - Responds by switching pages
- Medium-fidelity or High-fidelity in look & feel
- Low-fidelity in depth
  - The human operator in paper prototyping is aware of the algorithms

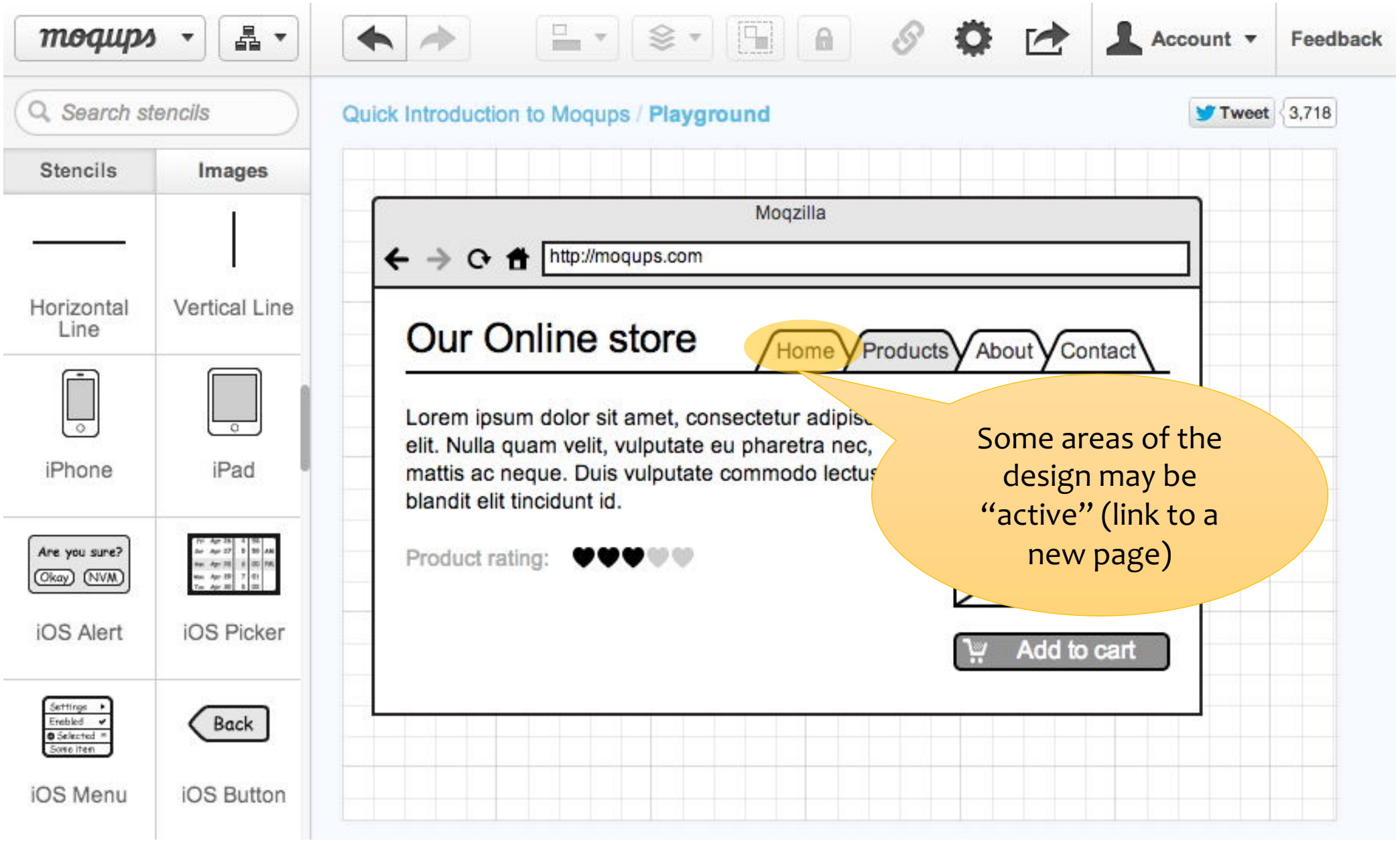
Medium-fidelity

- Also known as “Mockups” or “Wireframe interface”
- Design of a single screen or a set of connected screens (following a task)
- “Wavy” or “imprecise” drawing (inspired by hand drawing)
  - Want to convey the impression that the design is still preliminary
  - Black and white
- Usually static information (predefined pages, only)
- May suggest user device

Wireframes for the 3 interfaces



Web Desktop Mobile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Account
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Quick Introduction to Moqups / Playground
Tweet
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Images
Horizontal Line
Vertical Line
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iPad
iOS Alert
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iOS Menu
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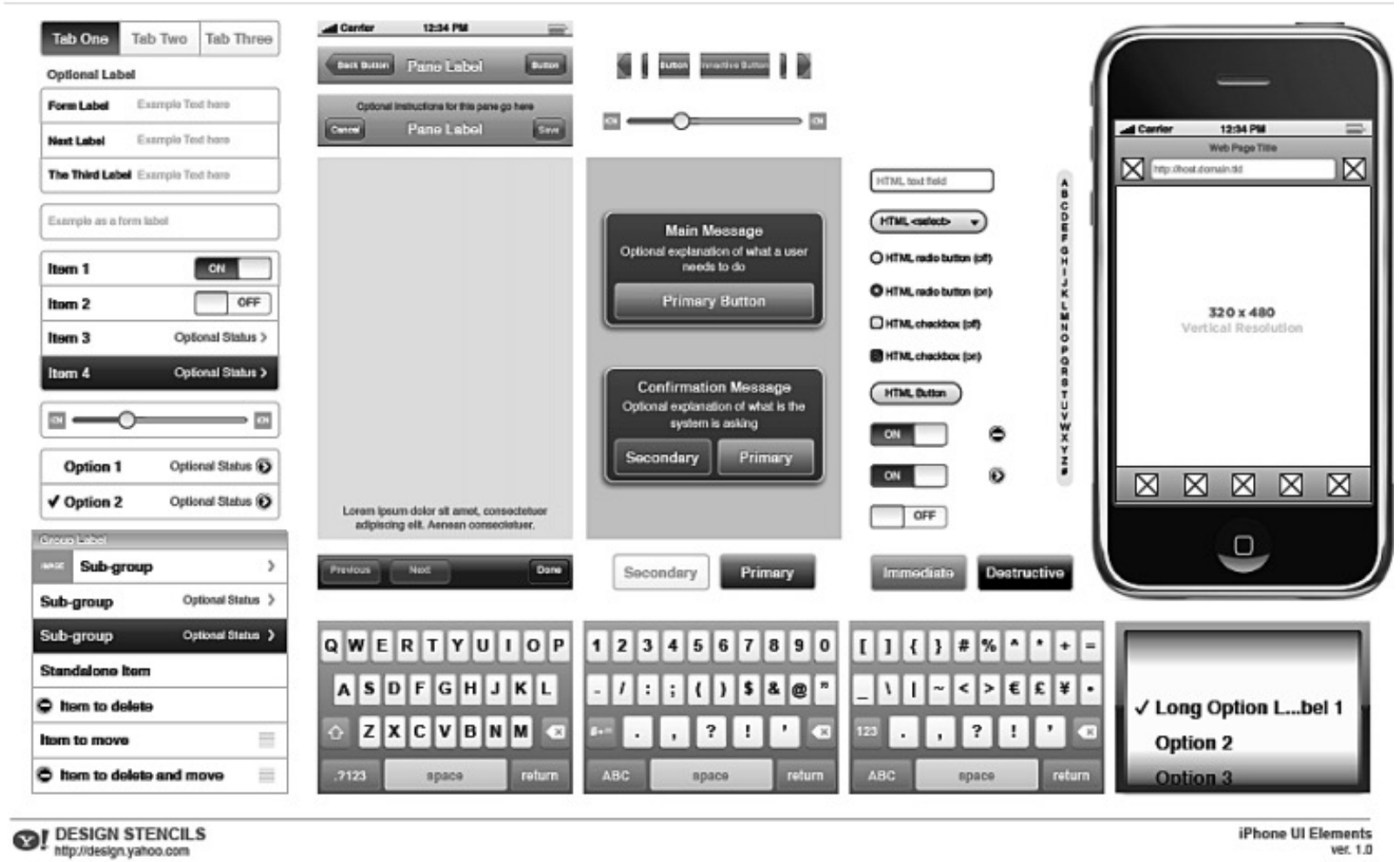
Product rating:
Add to cart
Some areas of the design may be “active” (link to a new page)

UI Design libraries

Stencils for UI elements



Some tools for wireframing

https://balsamiq.com/wireframes/
https://balsamiq.cloud/

https://moqups.com/

https://www.mockplus.com/

https://gomockingbird.com/

Example

Step 1 e B-Step 1

Step 2 3

Step 4 5a

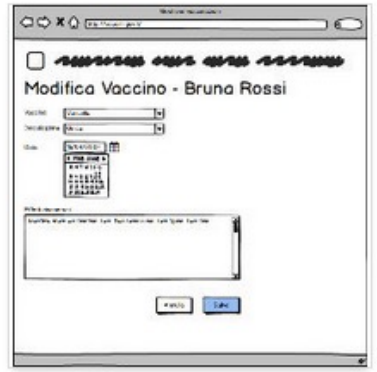
Step 2a

Step 4b

B-Step 6

B-Step 5a1 5a2

B-Step 5a3 5a4



B-Step 5c1 5c2

B-Step 5c3 5c4

Powerpoint-based Interactive mockups

Chiamata da contatto

Chiamata da sconosciuto

SMS ricevuto

Chiamata persa

Wireframing tools: drawbacks

- Click, not interact
  - No text entry, no data entry, no real selection of listed data
  - Widgets aren't active
- Paths are static
- The tester is engaged in a "hunt for the hotspot", to find the (few) only widgets that really clickable
  - Good for testing understanding of the UI and the workflow
  - Not good for testing the UI behavior

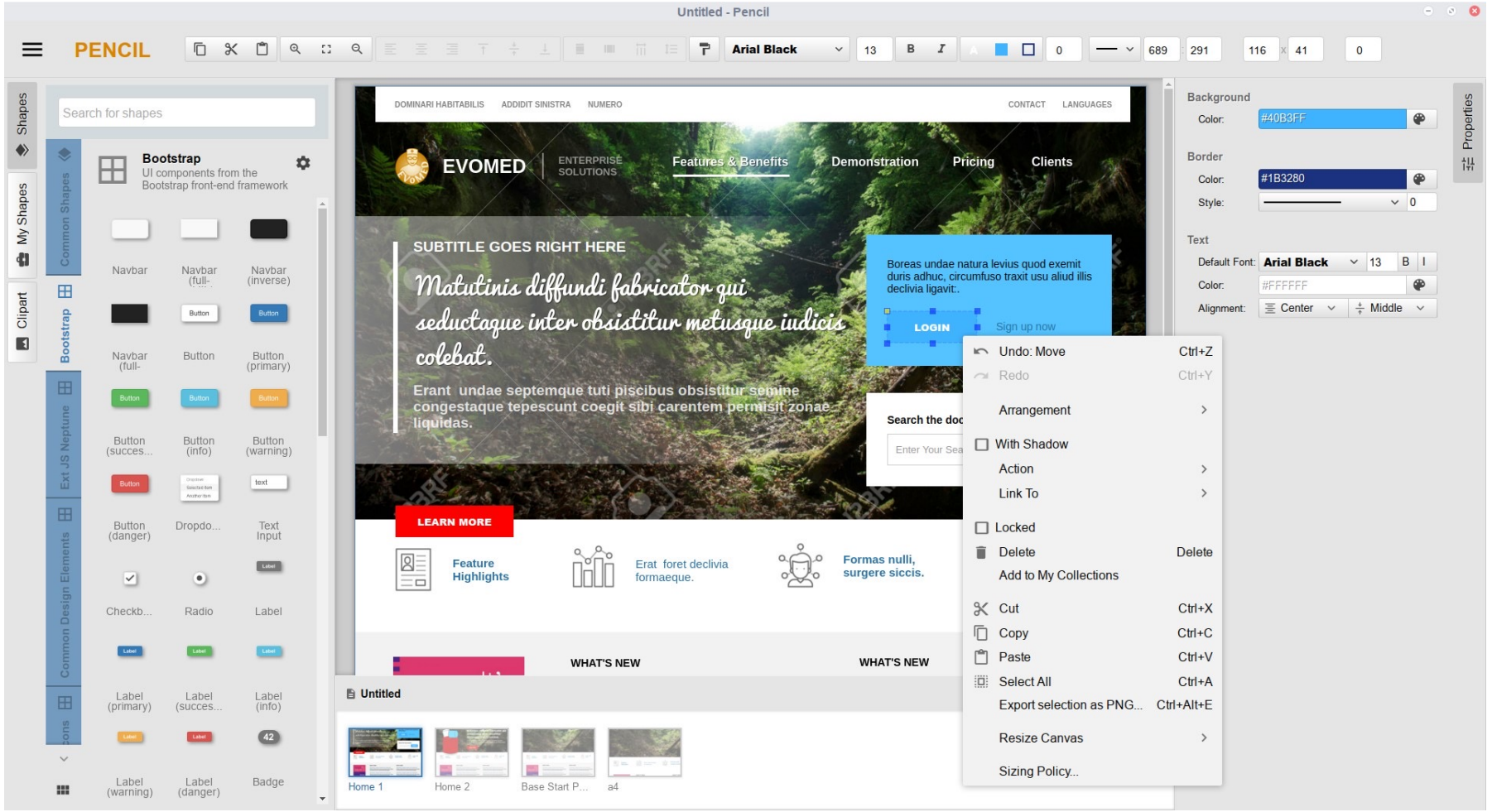
Hi Fidelity Prototypes

They look like the real thing. Widget behave realistically. But it’s still an illusion.

Hi-Fi Prototypes (Digital Mock-ups)

- Actual computer application, with final-looking layout, colors, and graphics
  - May use design prototyping tools
  - May use real application code
- Much more expensive to build
- More time is spent with graphic design than interaction design

High-fidelity computer prototypes
Semi-interactive



What can we learn from hi-fi interactive prototypes?

- Screen layout
  - Is it clear, overwhelming, distracting, complicated?
  - Can users find important elements?
- Colors, fonts, icons, other elements
  - Well-chosen?
- Interactive feedback
  - Do users notice & respond to status bar messages, cursor changes, other feedback
- Efficiency issues
  - Controls big enough? Too close together? Scrolling list is too long?

Suggested video

- **Prototyping fake it till you make it**
- By Apple Design Team
- https://youtu.be/3lqh-A5Jy4Q

Some tools for interactive hi-fi prototypes

https://www.invisionapp.com/

https://www.figma.com

https://froont.com/

https://webflow.com/

https://principleformac.com/

References

- Google, Begin Today With Rapid prototyping, https://www.youtube.com/playlist?list=PL9KVIdeJ2K8NDpsiyYpcbB_qifd3y5CYZ
- MIT, http://web.mit.edu/6.813/www/sp18/classes/11-prototyping/#reading_11_prototyping
- Scott Klemmer, Storyboards, Paper Prototypes, and Mockups, https://youtu.be/z4glsttyxw8

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