

Administrative Stuff

Examples of project processbooks and link to a project prototype on the website

Next Week:

Evaluation methods, cultural probes

Prototyping

Irene Rae
Computer Sciences

CS-570 Introduction to Human-computer Interaction

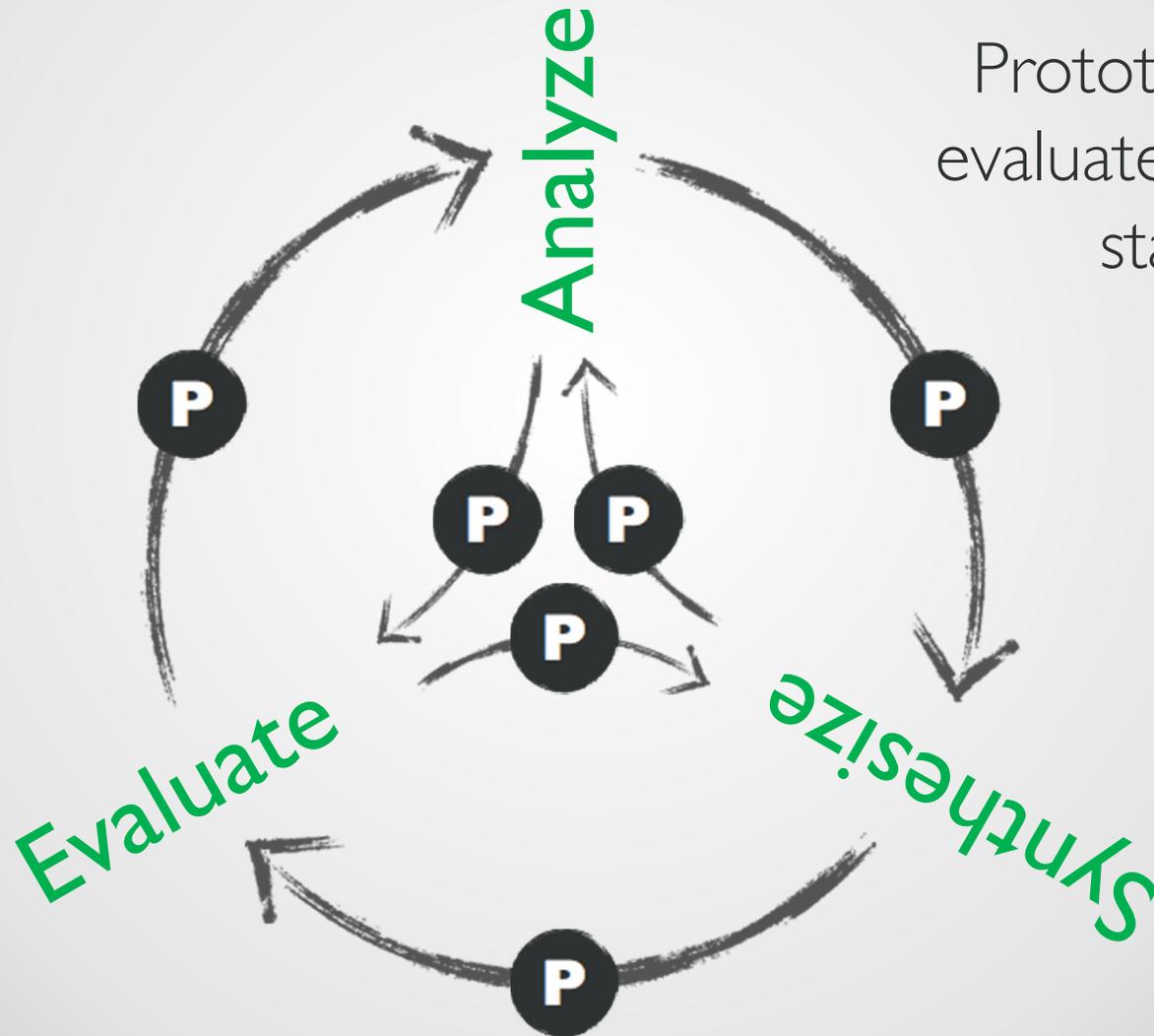


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Today: Prototyping



The Design Process



Prototype and
evaluate at every
stage!

Why Prototype?

Users often can't say what they want

If you give them something they get to use, they know what they don't want

Need a *bridge* between talking to users in the abstract about what they might want and building a full-blown system

Prototyping is that *bridge*

Benefits of Prototyping

Get quick feedback on a design

Experiment with alternatives

Fix problems before writing code

Keep design centered on the customer

Brings subtleties and nuances into the light

Gives us something to user test

What Counts as a Prototype?

Storyboard

Wizard of Oz prototypes

Computer animation

Partially working system

Cardboard computers

Video prototype

Hyperlink prototypes

Flash or VB prototypes

Sketches

Photoshop screens

Paper flipbooks

Role-playing scripts

Alpha & beta versions

Prototyping Approaches

Throwaway vs. evolutionary vs. incremental

Horizontal vs. vertical

Low vs. high fidelity

Throwaway (Revolutionary) Prototypes

Built, tested, and thrown away (useful in early stages)

Knowledge gained contributes to final system/next prototype

Can be expensive (if hi-fidelity)

Evolutionary Prototypes

Are not discarded but serve as a basis for the next iteration of the design

Danger of initially bad designs persisting

Incremental Prototypes

Final system built as separate components which are released separately and gradually incremented

Horizontal vs. Vertical

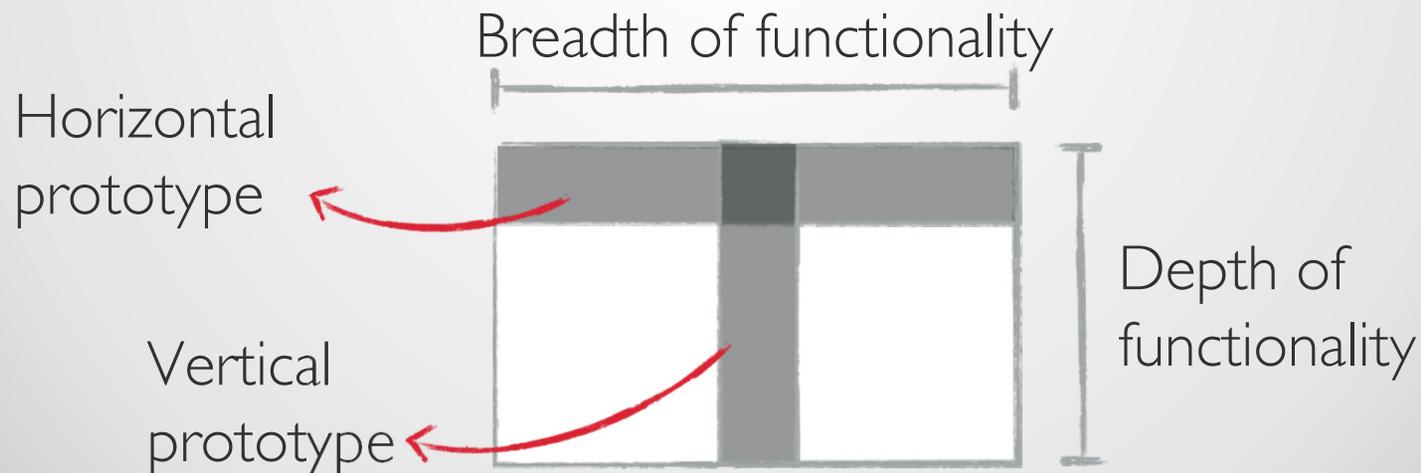
Horizontal prototypes

Give broad coverage of features but less depth

Superficial functionality

Vertical prototypes

Cover reduced number of features but in greater depth



Fidelity in Prototypes

Paper prototype

Proof of concept

Finished product

Design schematic

Beta release

Low fidelity

High fidelity

Not fully functioning

Fully functioning

The design may have sketch-like quality

Polished design

Quick to create or revise

More labor-intensive to create or revise

Low associated cost

High associated cost

Low-Fi Prototypes

Questions?

TopHat Question

Low-Fidelity Prototypes

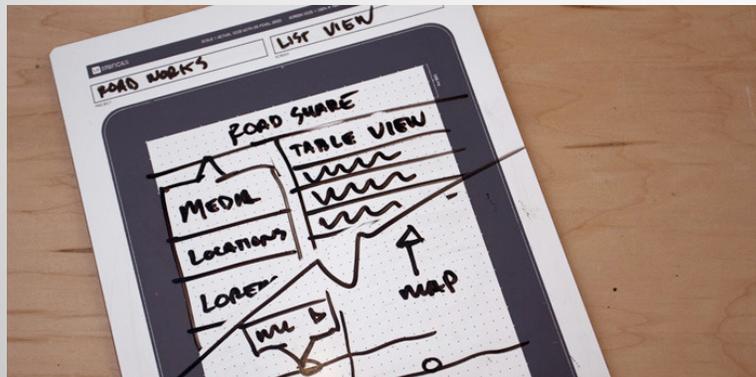
Quick paper- or cardboard- based designs that emphasize overall concepts but leave many details unresolved



Quick to make

Easy to change

Reactions are mostly conceptual



Low interactivity

Hard to “fake” interactivity

Can't be used to assess detailed choices

Not Done!

Use no higher resolution than necessary

Do not suggest that they are further along than they really are

Explore instead of **confirm**

“This is an idea! I’m not done!”

“The more “done” something appears, the more narrow and incremental the feedback.”



Looks Done

Mocked up in Photoshop, a multimedia program (Director, Flash, etc.), or a GUI builder (NetBeans, Visual Studio, etc.)

“Can you change the font on that “T”?”

Not sure I like the bevel line weight..”

Feedback: detailed tweaks to specific features. Very focused and incremental.



Visio, Powerpoint, etc.

Illustrated using a professional drawing or presentation tool.

“I don’t like the two-column layout for tools. Can we have them go across the top?”

Feedback: tweaks to the ‘screen’ or page as a whole. Incremental improvements.



Rough Sketch

Scanned from a hand-drawing, made with a drawing app and a tablet, or using the Napkin Look and Feel skin.

“Maybe the tools should be context-specific... Let’s kill the toolbar and bring up only the tools that make sense at that moment..”

Feedback: higher-level features are questioned, bigger changes possible.



Storyboard or Use Case

The “story” of how the user might need or want to interact with the interface (app, book, product, etc.)

“We should NOT try to put a drawing feature in here... it’s featuritis without a key benefit to most users.”

Feedback: big-picture ideas, possibility for revolutionary changes.

Low-Fidelity Examples

Paper sketches

Paper flipbooks

Hyperlink flipbooks with scanned sketches

Cardboard Computers

Foam core mockups

Role-playing scripts

Low-Fidelity Tools

Large, heavy white paper

Colored paper

Thumbtacks

Cardboard or foam core

Index cards

Tape or glue

Pencils, pens, markers

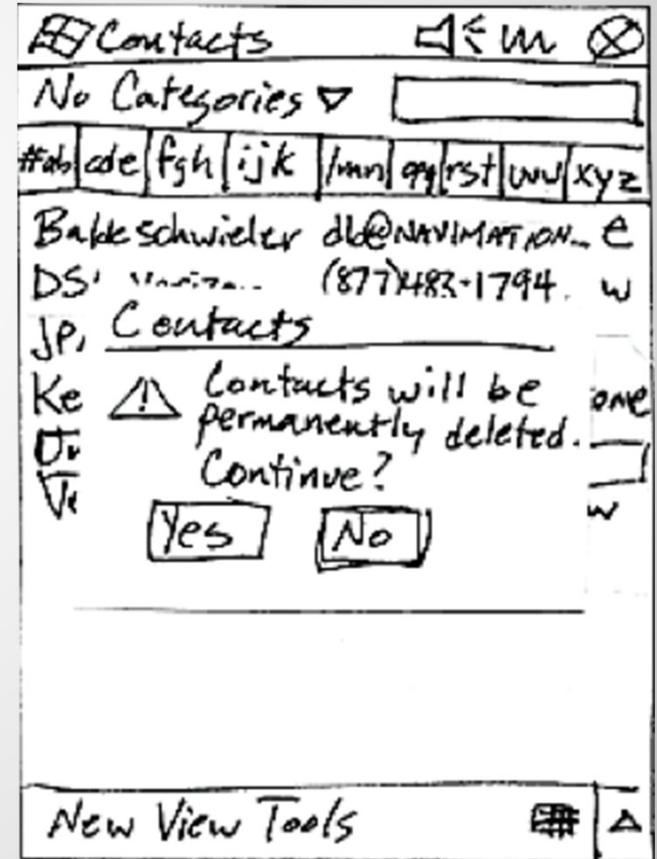
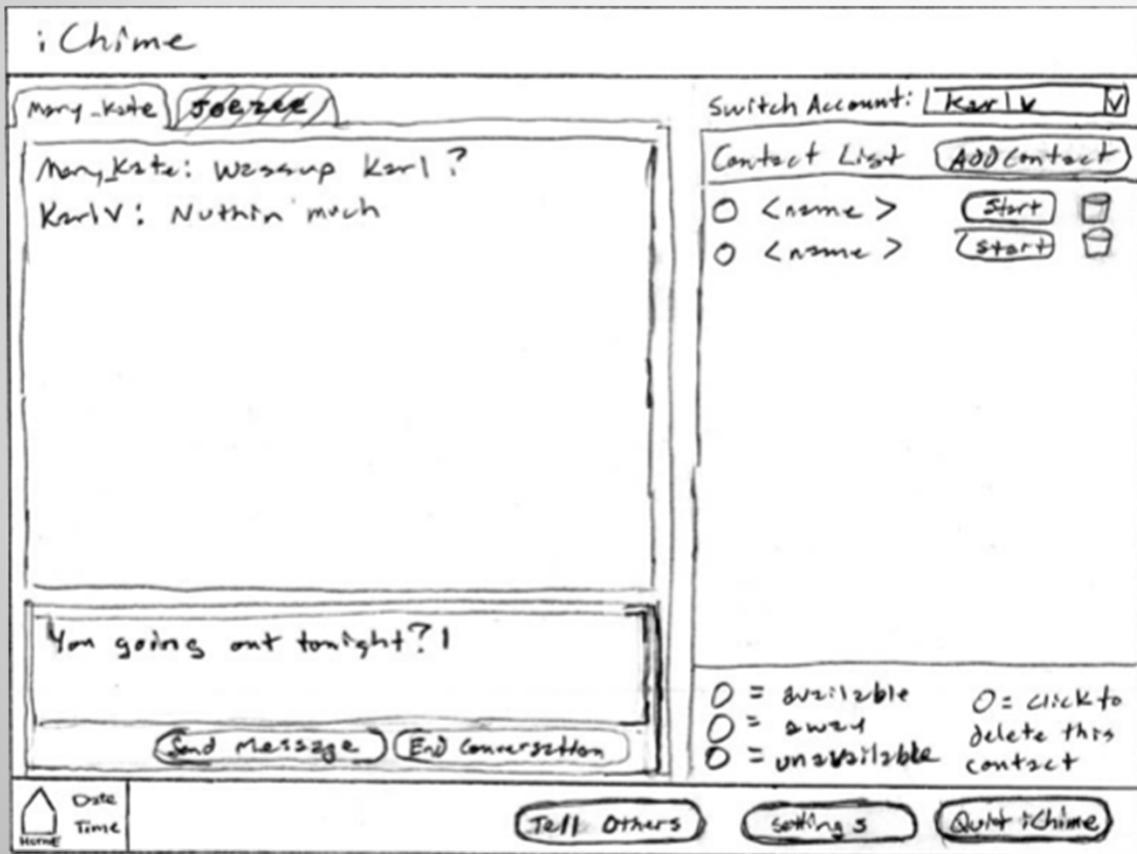
Overhead transparencies

Scissors

Exacto Knife

Paper Sketches

Screenshots drawn by hand, one screen per page

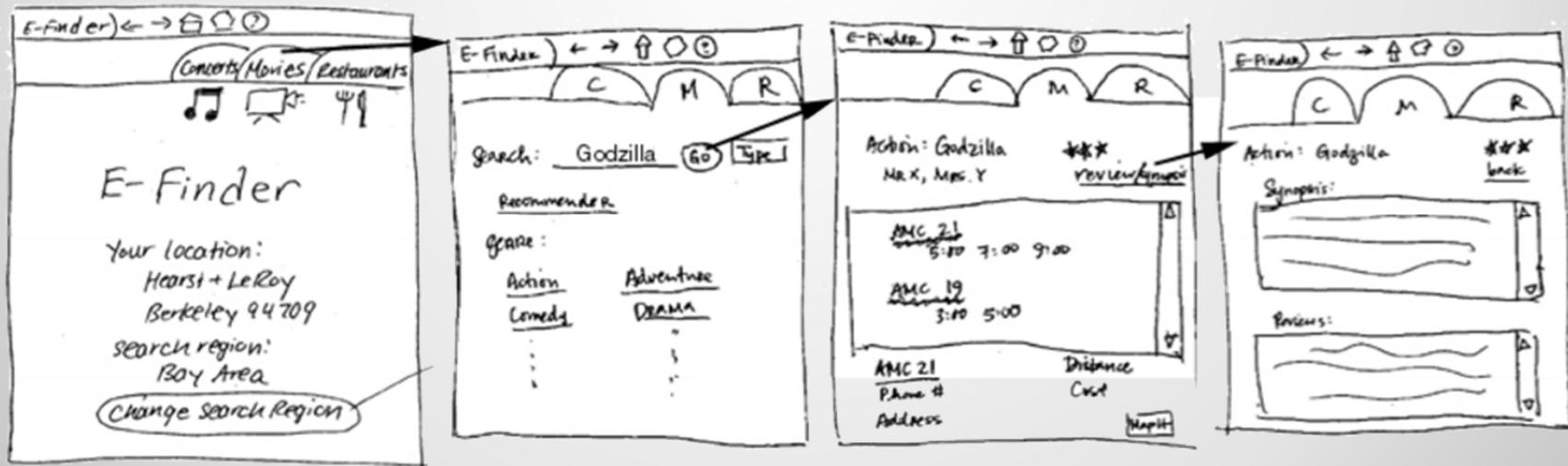


Paper Flipbooks

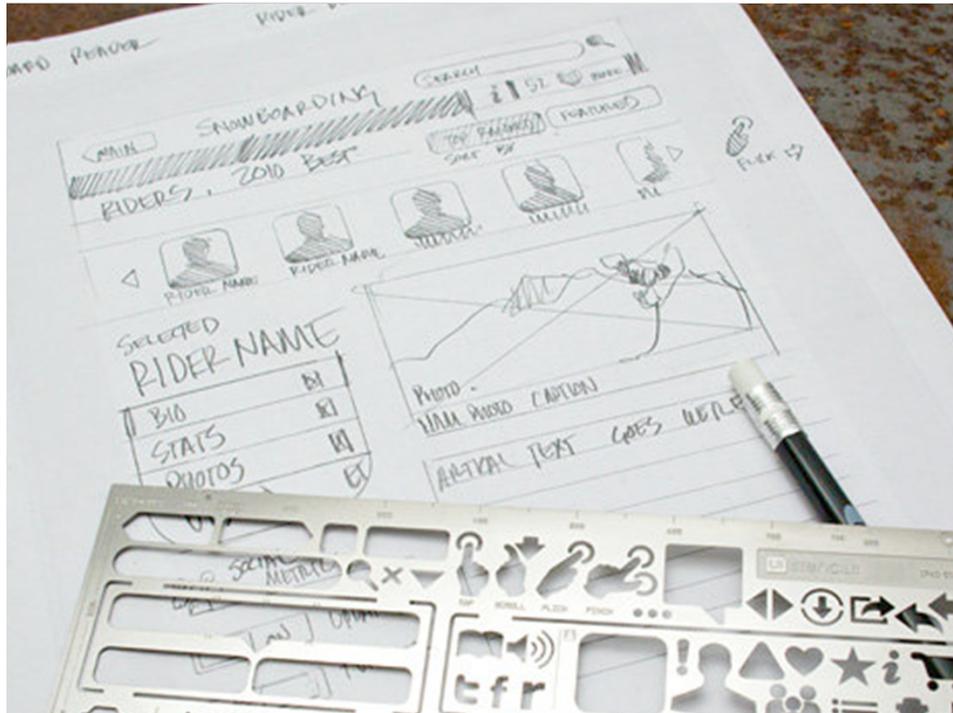
Use multiple paper sketches to simulate interaction.

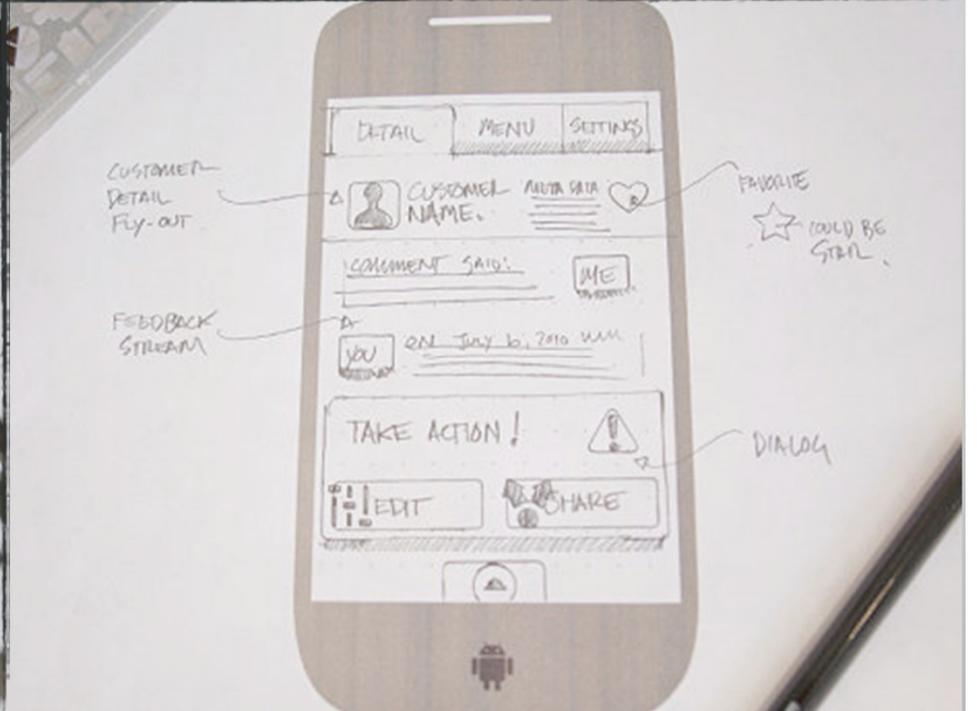
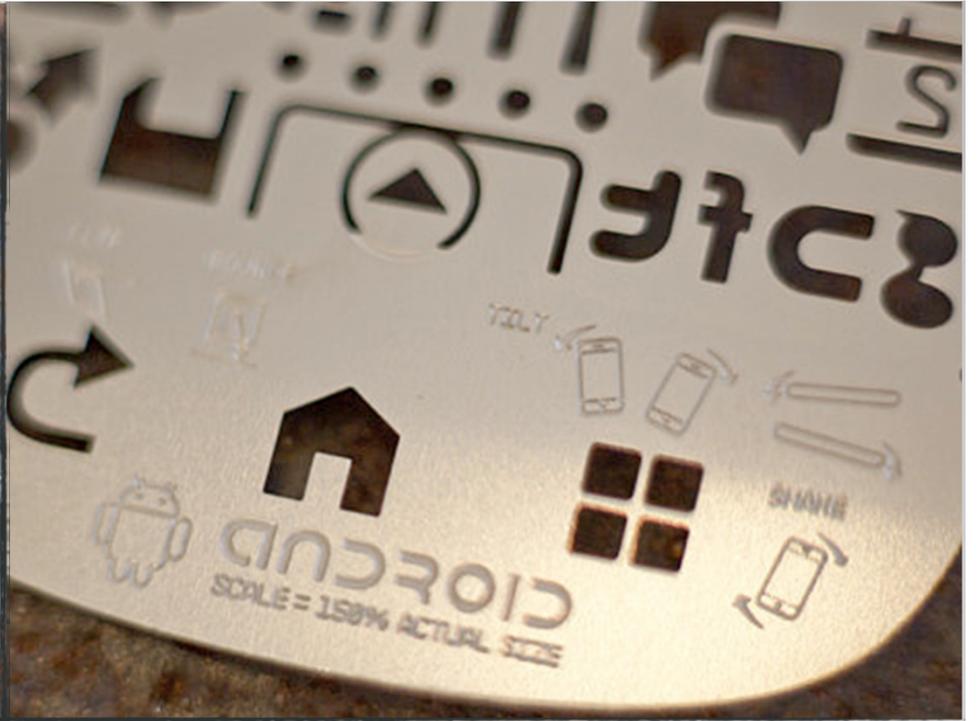
When user “clicks” with their finger, flip to proper screen.

Use photocopying to avoid re-sketching everything

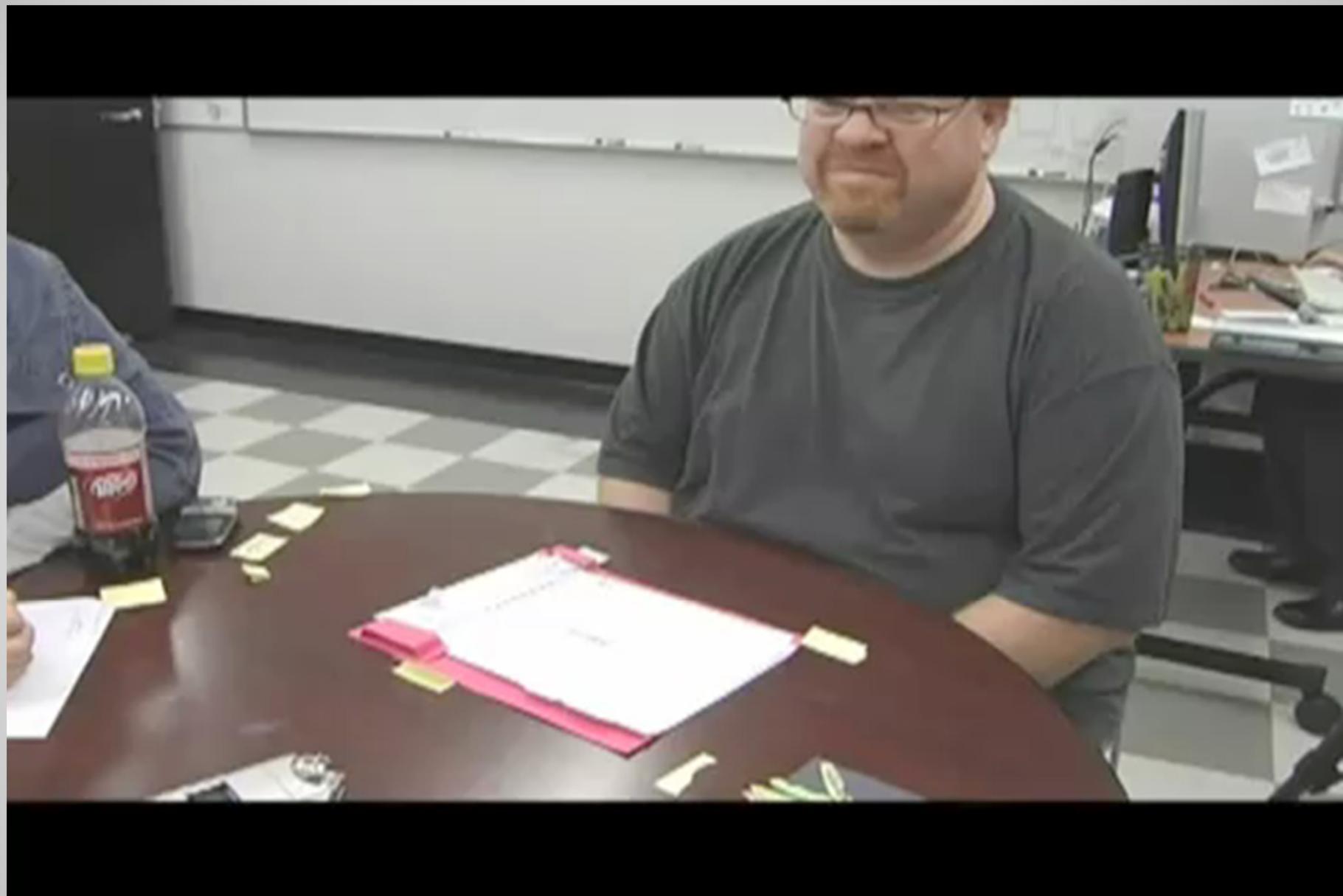


(Each screen would be a separate page.)







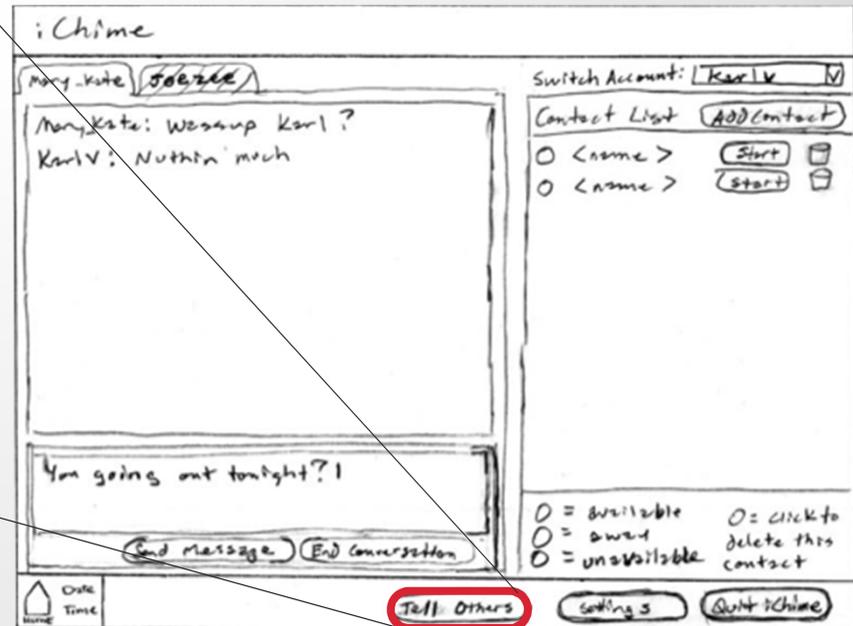


Hyperlink Flipbooks

Link drawn screens together in HTML by using image maps

```
<body>

  <map name="buttons">
    <area shape="rect"
coords="128,132,241,179"
      href="screen3.html">
    <area shape="circle" coords="68,211,35"
      href="screen4.html">
    <area shape="polygon"
coords="19,44,45,11,87,37,82,76,49,98"
      href="screen2.html">
  </map>
</body>
```



<http://www.javascriptkit.com/howto/imagemap.shtml>

Cardboard Computers

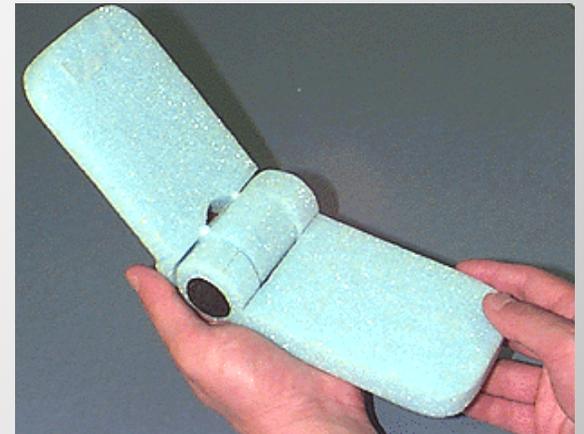
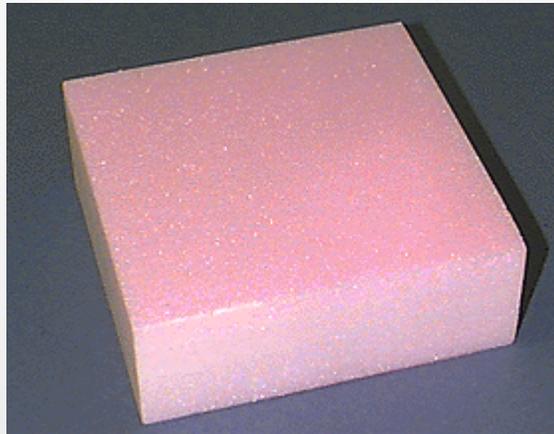
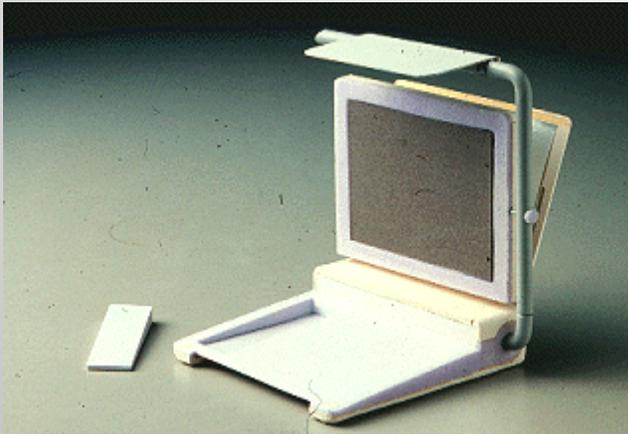
Use cardboard to create physical computer size and shape

Often use the “screen” to host a paper flipbook



Foam Core Mockups

Foam core can be shaped, cut, filed, sanded, and painted quickly and without fancy tools



Scenarios & Role-playing



Designers and possibly participants act out a futuristic scenario to demonstrate a new user experience.

Low-Fi Prototype Pros

Involve users early in design and evaluation

Cheap, fast to learn and use

Less attachment to designs on the part of the designer

Shifts emphasis to creating the design rather than using the tool

Elicits comments on conceptual design rather than style details

Potential for creative designs

Low-Fi Prototype Cons

Low interactivity

Difficult to store, edit, and search

Inadequate as a stand-alone design specification

Inappropriate for impressing clients

Layout and design choices may fail to take account of system constraints or platform specific guidelines

Do not allow realistic use

Questions?

Hi-Fi Prototypes

High-Fidelity Prototypes

Interactive computer-based designs that convey details of the visual and interaction design

Strengths

Details are visible

User testing can be more realistic/fluid

Design can be more strongly communicated

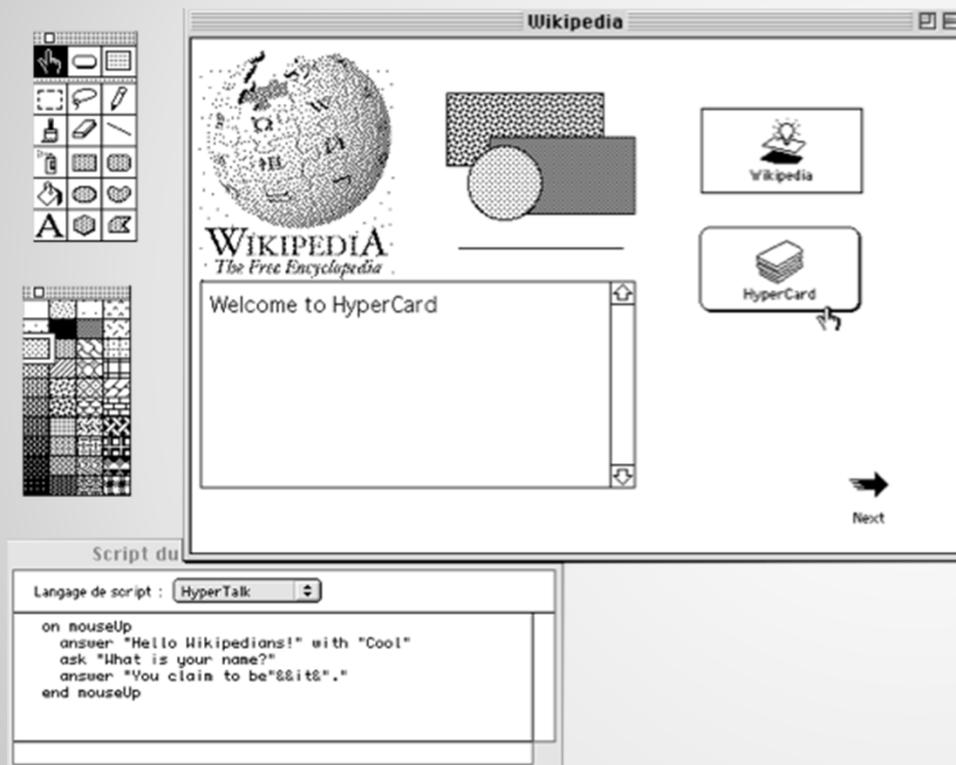
Weaknesses

Encourages nit-picky feedback (e.g., colors)

Takes longer to build

Designers become attached to them

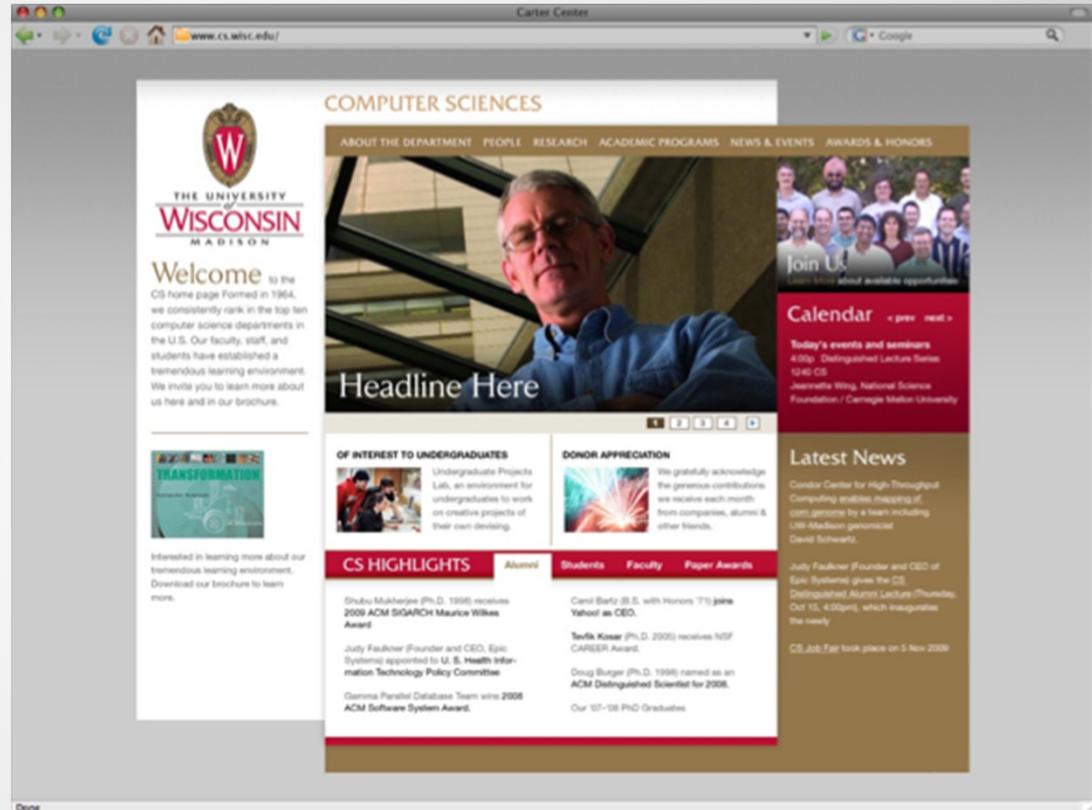
Hi-Fi Examples



Flash prototypes
Visual Basic prototypes
HyperCard stacks
Photoshop screens
D/HTML flipbooks
Video prototypes
Wizard of Oz
prototypes

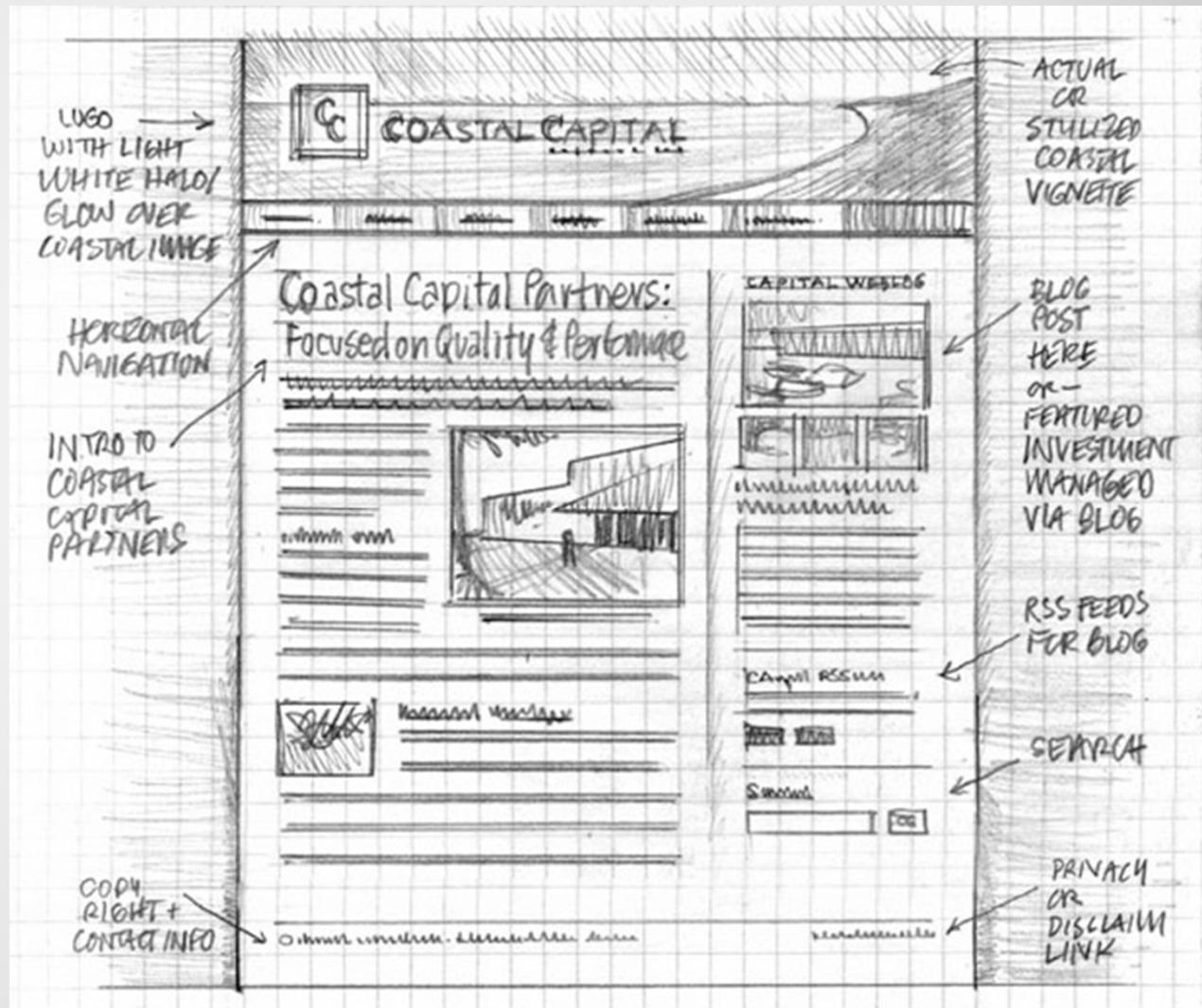
Photoshop Screens

High-fidelity mockups that aren't interactive but can be used in flipbooks or to elicit user reactions



Wireframes

Hand-drawn sketch



Wireframes

Plain HTML
(Content prototype)



HEADER (600 x 100)

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MISSION STATEMENT

"Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world." - Albert Einstein

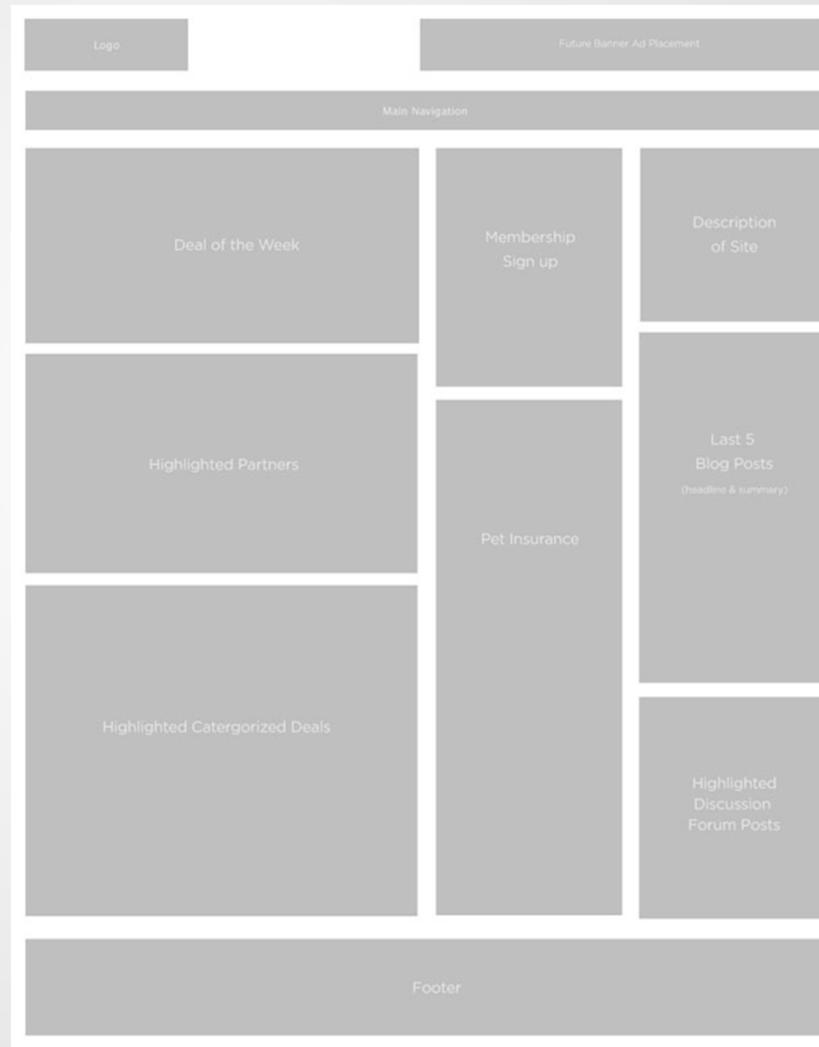
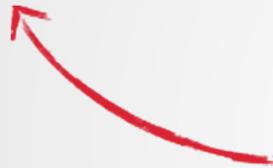
VISION STATEMENT

"Art has the power to bring us together while fostering an appreciation for our differences and celebrating our similarities." - Val Vigiotti, Founder

Copyright 2009

Wireframes

Layout prototype



Wireframes

Functioning components



TiddleLeWeb the social conferencing tool

Uh-oh! The free conference wifi is playing up. **!**
Your action has been **queued** and will complete when the network comes back.

Make notes | Post to blog | Shout to microblog > | Queue **3**

Day 1 | Day 2 | Workshops

0900 - 1000 **SpeakerName1**

1000 - 1100 **SpeakerName2**

1200 - 1300 **SpeakerName3**

- You
- PhilHawksworth
- JonLister
- PhilWhitehouse
- StrangerUser
- AnotherUser

1430 - 1530 **SpeakerName4**

1530 - 1630 **SpeakerName5**

1630 - 1730 **SpeakerName6**

My message

Twitter

Pownce

Jaku

#LeWeb3. You can post things to multiple social sites from this single box.

Post

SpeakerName3 close

1200 - 1300 **Session subtitle goes here** close others

Perhaps a synopsis... Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. edit

Your own notes... Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. share

SpeakerName3 from PhilHawksworth code close close others

Phil's notes... Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

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Wireframes

Visual &
typographical
elements



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A la une

Surtitre | publié le 12/12/07
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■ Voir l'article ■ Tags : lorem, ipsum, diligat

WEBZINE ECODEFI Question.du.mois | publié le 12/12/07
Placements des collectivités locales : une loi encore beaucoup trop restrictive ?
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Voir l'article ■ Tags : collectivités, ecodéfi

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Interviews

Claire Dupond
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postée le 24/01/08 [↗ tous les interviews](#)

Agenda

23 janvier Lorem ipsum et diligat
Integer ante liquam erat volutpat et eenean sem liquam.
Du 23 au 28 décembre 2007

12 février Lorem ipsum et diligat
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Du 23 au 28 décembre 2007

15 mars Lorem ipsum et diligat
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Du 23 au 28 décembre 2007

05 avril Lorem ipsum et diligat
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Du 23 au 28 décembre 2007

Fil d'info

Localita
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Integer ante liquam erat volutpat et eenean sem liquam, et diligat lipsum. Integer ante liquam erat

Hospimedia
Etiam oremet investus
Integer ante liquam erat volutpat et eenean sem liquam, et diligat lipsum. Integer ante liquam erat

Trier par Expertises

- ◆ Finances et fiscalité
- ◆ Investissement et équipements
- ◆ Environnement
- ◆ Habitat / urbanisme
- ◆ Santé
- ◆ Social / Services
- ◆ Transport

WEBZINE ECODEFI
ENQUETE
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QUESTION DU MOIS
Integer ante liquam erat volutpat et eenean sem liquam.

WEBZINE ACTIONS COMMUNES

BILAN CARBONE
Integer ante liquam erat volutpat et eenean sem liquam, eenean sem liquam.

Nouvelle génération internet

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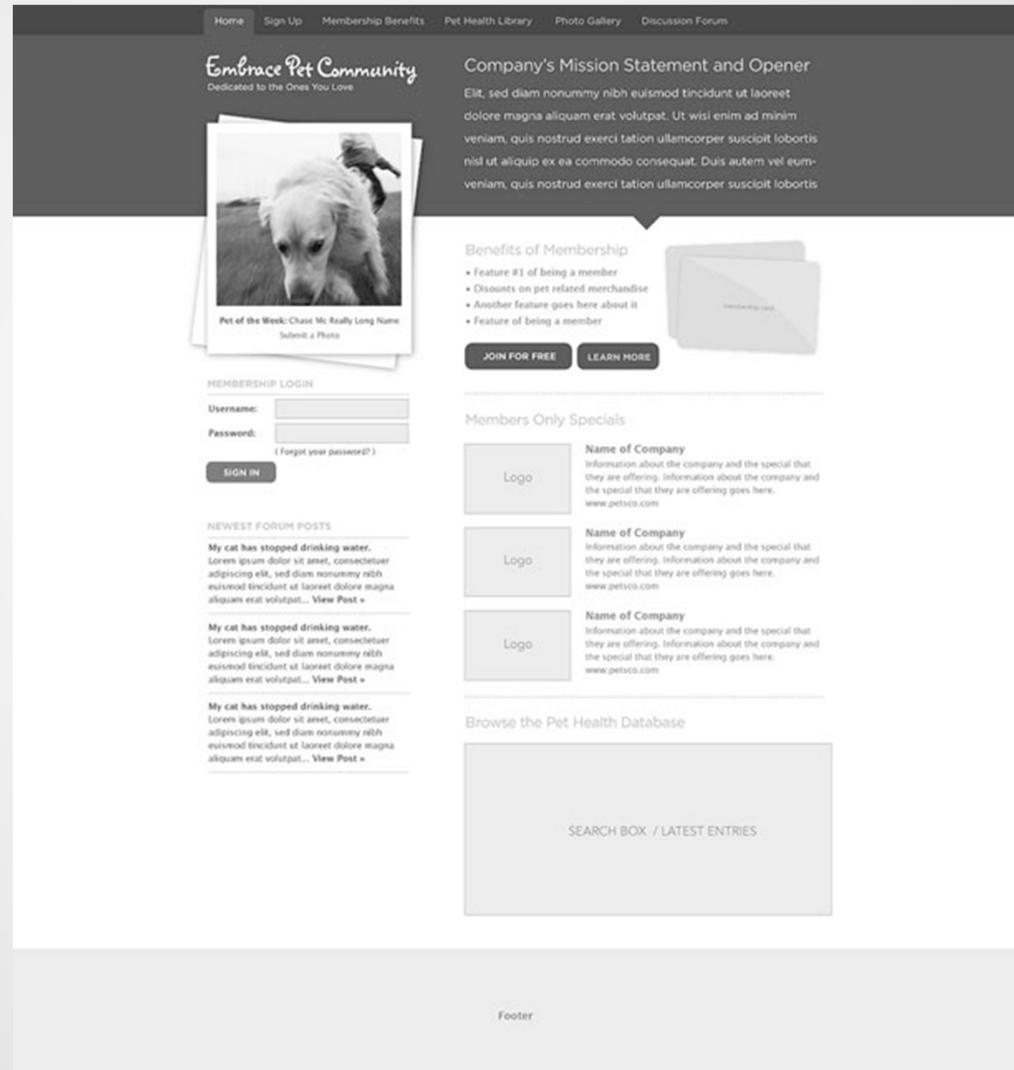
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◆ Mentions légales

Contact
◆ Contactez-nous
◆ FAQ
◆ Envoyez vos questions

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Wireframes

Images, color
scheme, final-ish
content



Wireframes

Final-ish outline,
content, and color
scheme



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Ellen Lupton
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About author

Ellen Lupton is a writer, curator, and graphic designer. She is director of the Graphic Design MFA program at Maryland Institute College of Art (MICA) in Baltimore, where she also serves as director of the Center for Design Thinking. As curator of contemporary design at Cooper-Hewitt, National Design Museum since 1992, she has produced numerous exhibitions and books, including Mechanical Brides: Women and Machines from Home to Office (1993), Missing Messages: Graphic Design and Contemporary Culture (1996), Letters from the Avant-Garde (1996), and Skin: Surface, Substance + Design (2002).

[place for bookmark/social icons, print etc.]

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D.I.Y.: Kids
D.I.Y. Kids, by Ellen and Julia Lupton, is a design book for children illustrated with kids' art (2007). Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam rhoncus, felis a lobortis nonummy, quam magna interdum metus, quis cursus velit eros eu felis. Nam vel magna.

D.I.Y.: Design It Yourself (Design Handbooks)
D.I.Y.: Design It Yourself is a design guide for everyone, written and designed with MICA MFA students (2006). Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam rhoncus, felis a lobortis nonummy, quam magna interdum metus, quis cursus velit eros eu felis. Nam vel magna.

Thinking with Type
Thinking with Type is a critical guide to typography, intended for use by anyone who works with words (2004). Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam rhoncus, felis a lobortis nonummy, quam magna interdum metus, quis cursus velit eros eu felis. Nam vel magna.

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Wireframes

Working components and content placed in a final outline



15

inscrit / gestion de compte / Vous / Votre profil

Bonjour Marie - vous avez reçu 1 invitation

Rechercher [] dans les Q-R

MarqueSite La communauté des parents éveillés

Invitez vos ami(e)s

accueillie par Fisher-Price

Questions-réponses Carnets de parents Communauté

Votre compte

Vous

Votre profil Vos enfants Vos préférences

Votre communauté

Vos bookmarks

Vos publications

Votre profil

Données personnelles Vos centres d'intérêts Votre géolocalisation Votre présentation vidéo

Données personnelles

Enregistrer les changements

Prénom

Alias (optionnel)

Nom de famille

Adresse e-mail

Date de naissance

Pays

Code postal

Ville

[Vous voulez changer votre mot de passe ?](#)

Votre photo ou avatar

Choisir un avatar

Cliquez sur un portrait pour le sélectionner

ou sélectionner une de vos photos

Choisir

Google Maps Implementation Proposal



Flash Etc.



Adobe Flash and similar tools can be used to provide prototyping environments for quickly creating interactive user interfaces.

D/HTML Flipbooks

Dynamic HTML or HTML5 can create interactivity

Example: add hotspot rollovers for highlighted buttons

This level of detail usually means you're using hi-fi screenshots made in Photoshop

Video Prototypes

Use video to portray the functioning of a system, even with low-fi elements; or

Short video clips can be used to fake interactivity, sort of like a flipbook, but with video clips

When users take action, play the next appropriate clip

Wizard-of-Oz

The designer sits “behind the curtain” simulating the functioning of the system for a user

Usually involves two connected computers

Example: robot receptionist

Chauffered Prototypes

A third party walks the user through the prototype

Only a select few paths have been implemented

Can be used with a vertical prototype

Example: videogames at expos far before release

Hi-Fi Prototype Cons

Expensive

May freeze a specification

“Owned” by the designer

Imposes a particular style

Can set user expectations too high

Prototyping Tips

Use the right level of fidelity for current stage

Don't go hi-fi too soon!

Don't stay low-fi forever!

Provide just as much detail as necessary: no more, no less

Low fidelity != poor design

Design can impact the effectiveness of the sales pitch at all fidelity levels

Don't get too attached, can stifle innovation

Last Prototyping Tip

The more you can iterate and test, the better your final design will be!

Testing Prototypes

Tips for Testing

Give people tasks or scenarios of use

Ask them to use the interface to complete the task

Ask them to think-aloud as they do the task

Observe breakdowns, shortcuts, confusion

Ask users why they think breakdowns occurred/why they took shortcuts, etc.

Paper Prototype Testing Setup



Questions?

TopHat Question