

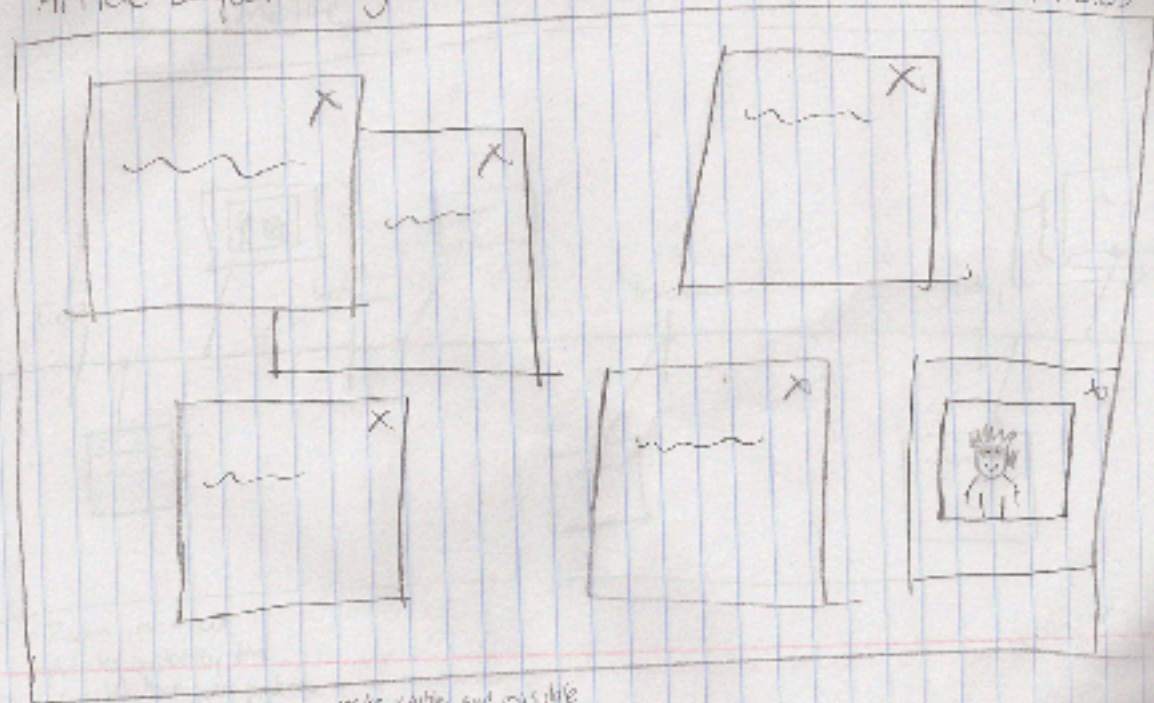
# Prototyping

SWE 432, Fall 2018

Web Application Development

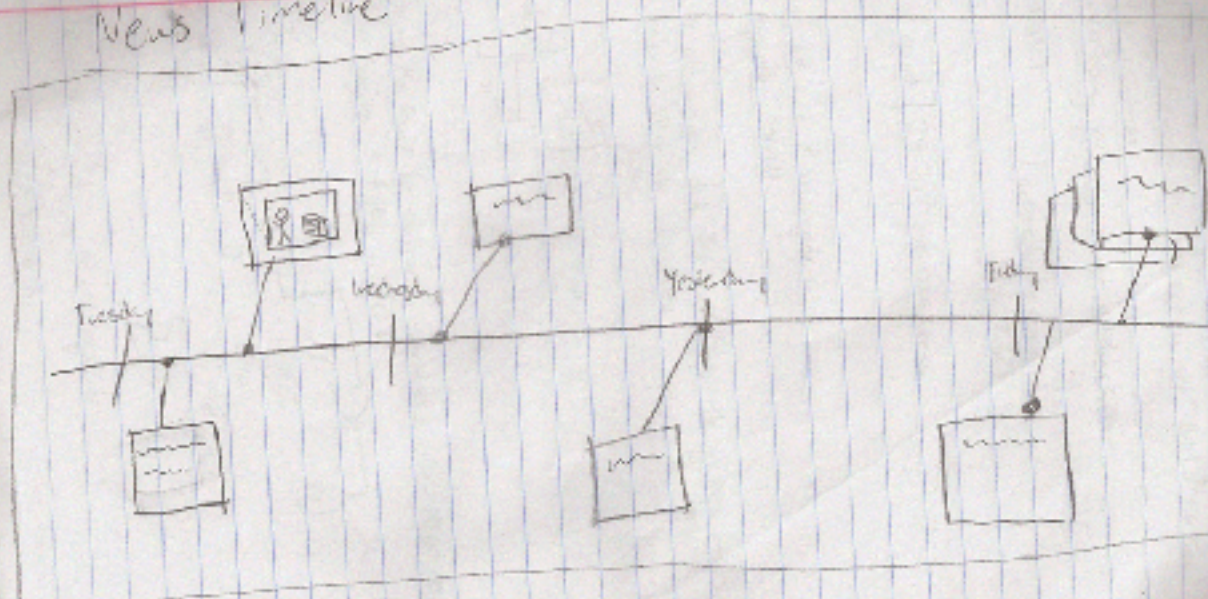


## Article Layout through movable windows (DADA) - drag and drop articles



- Movable windows
- closeable
- layout by importance
- make rather than misfile

## News Timeline



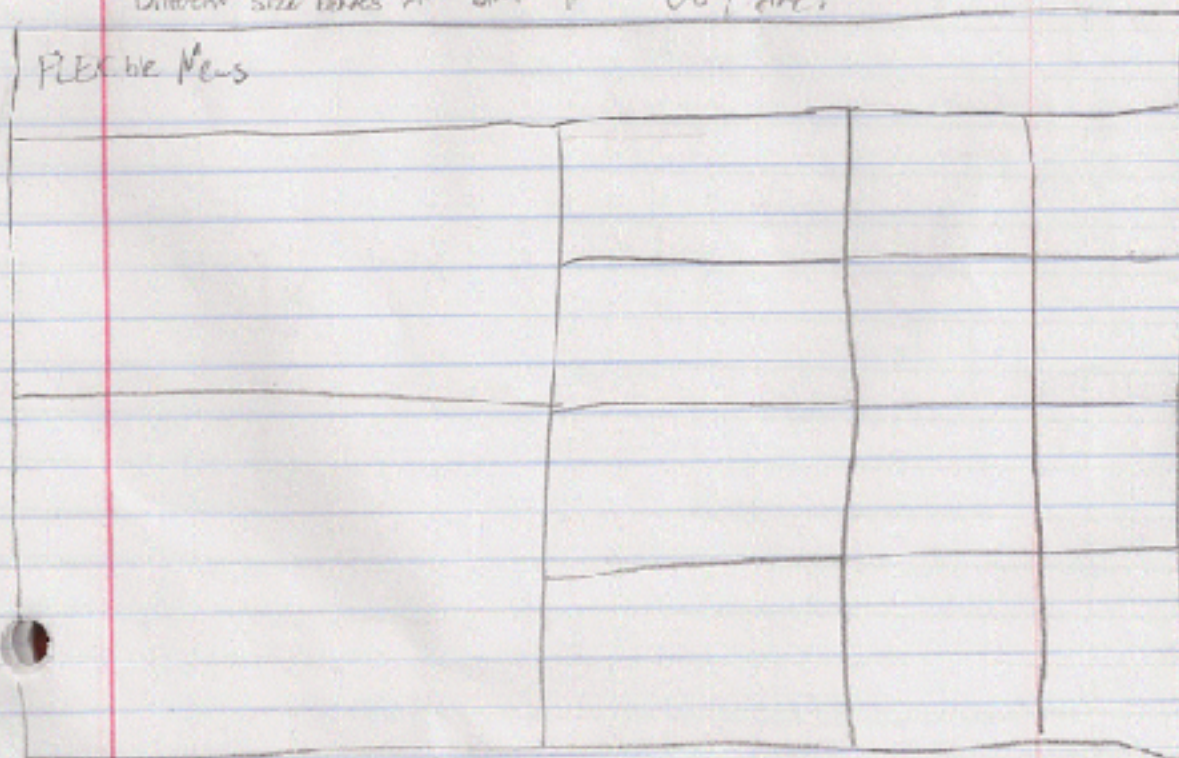
- Zoom in & out
- Articles sorted by time
- Could use just pictures

## UID Wireframe



- Even boxes?
- Different size boxes with same format every time?

## Flexible News



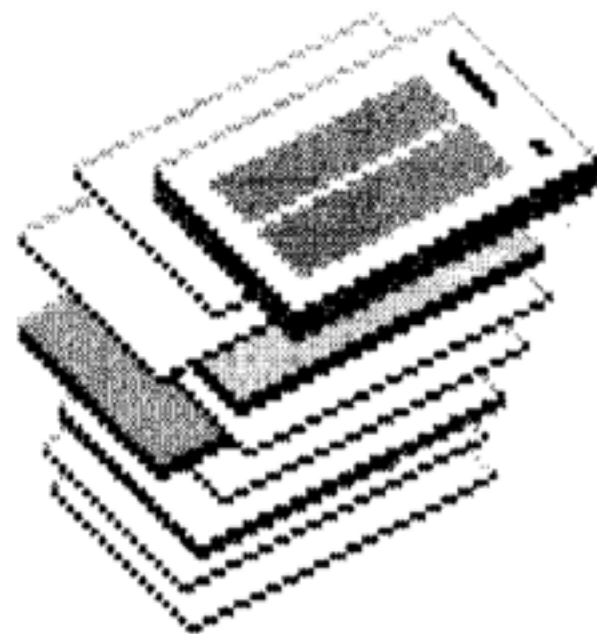


# Conceptual design

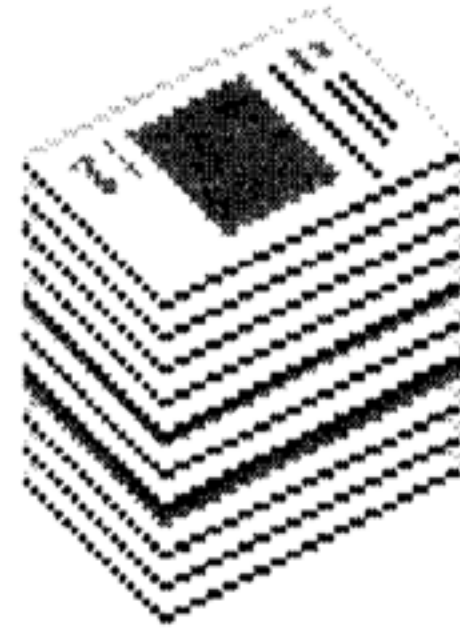
- Goal: match users' **mental model**
- Tool: Metaphor - analogies from existing system
  - Offers expectations about what system does & what can be done
- Examples
  - Email <—> physical mail
  - Backup software <—> time machine
  - OS desktop <—> top of a desk

# Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
  - System-created piles



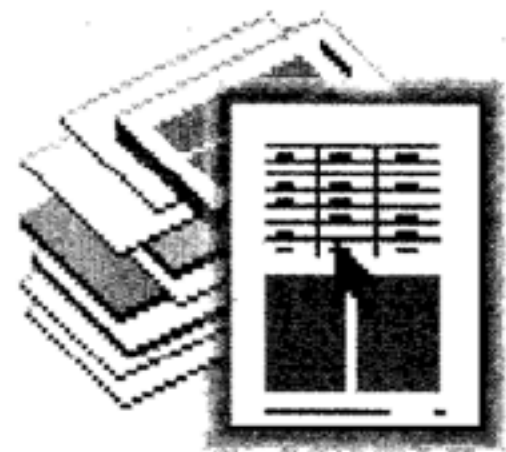
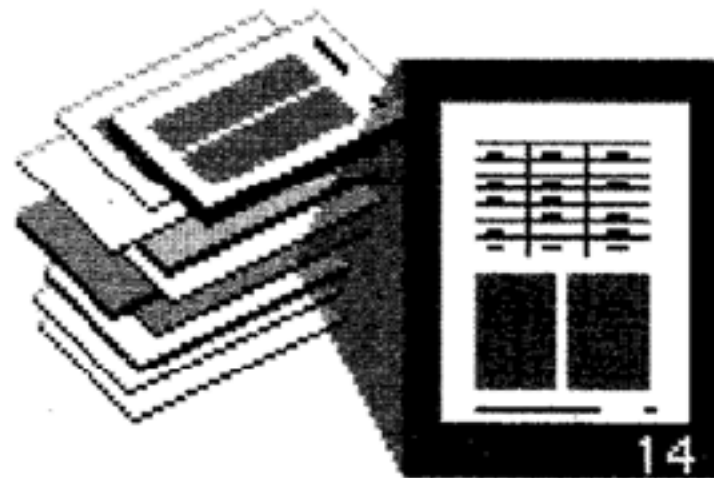
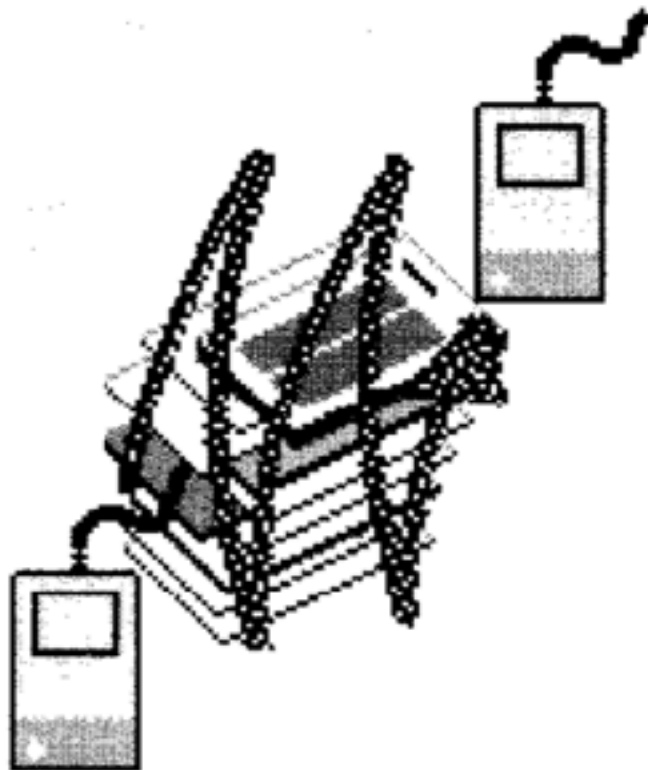
User-created pile  
(messy)



System-created  
pile (Organized)

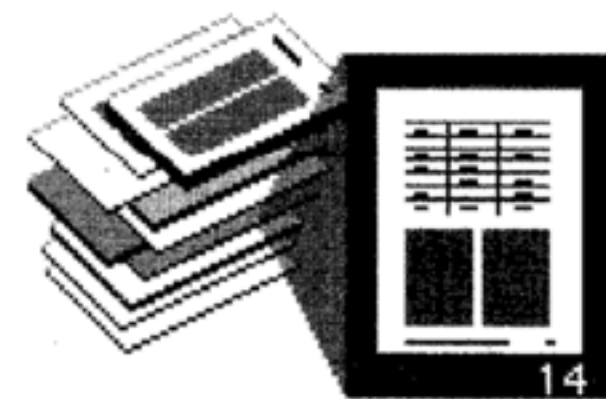
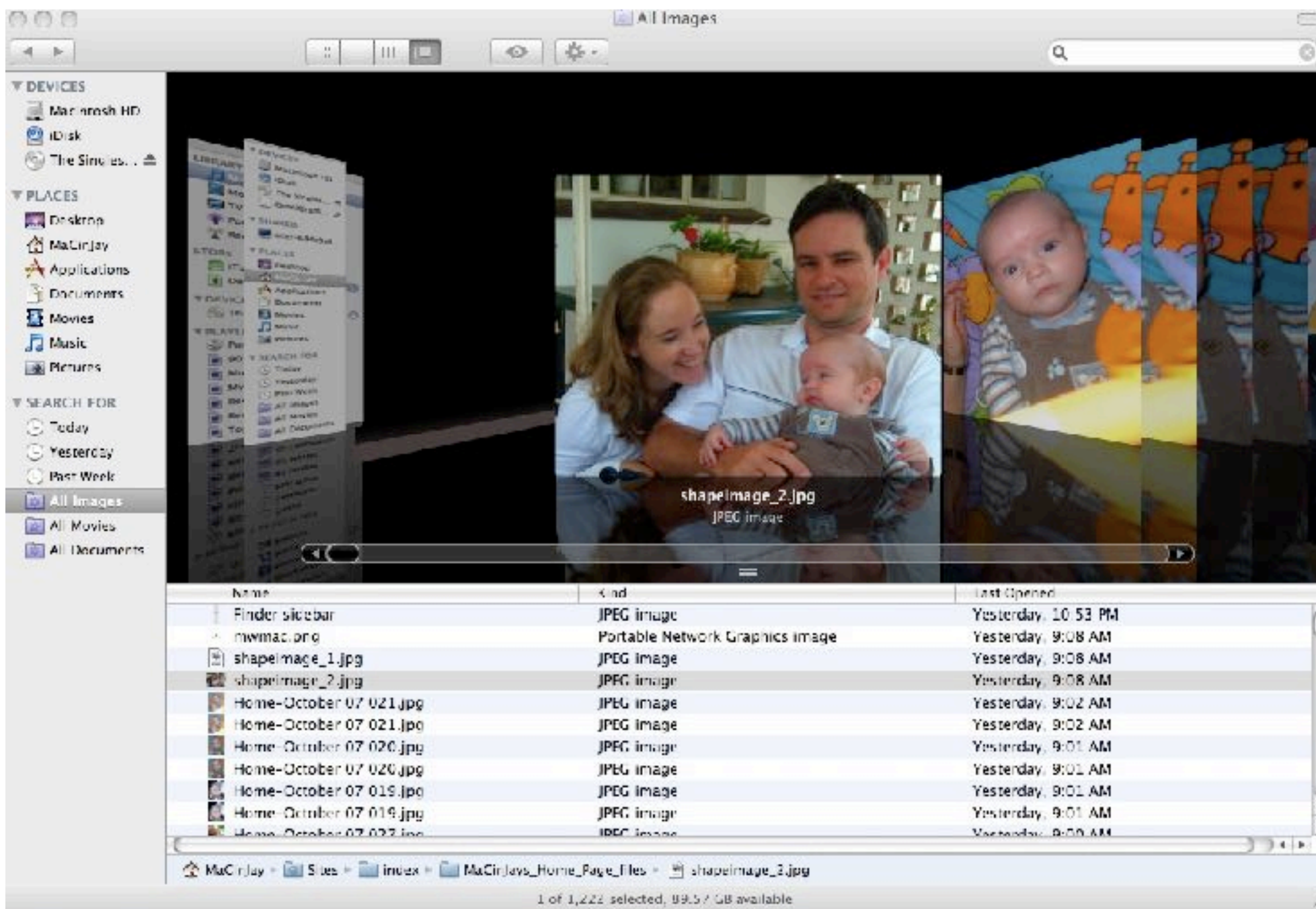
# Piles - Sketches

- Created sketches to facilitate discussion and evaluation
- Example features:
  - Browsing and maintaining structure (kind of like hinge)



# Piles - Legacy

- Patent issued to Apple in 2001
- 2007 (OS 10.5) introduced Cover Flow



# Today

- How do we set ourselves up to build good interfaces from the start?
- What is the iterative process by which we start out with a lot of ideas, and end up with some good, end result interface?

For further reading:

<http://interchangeproject.org/2013/11/02/paper-prototyping/>

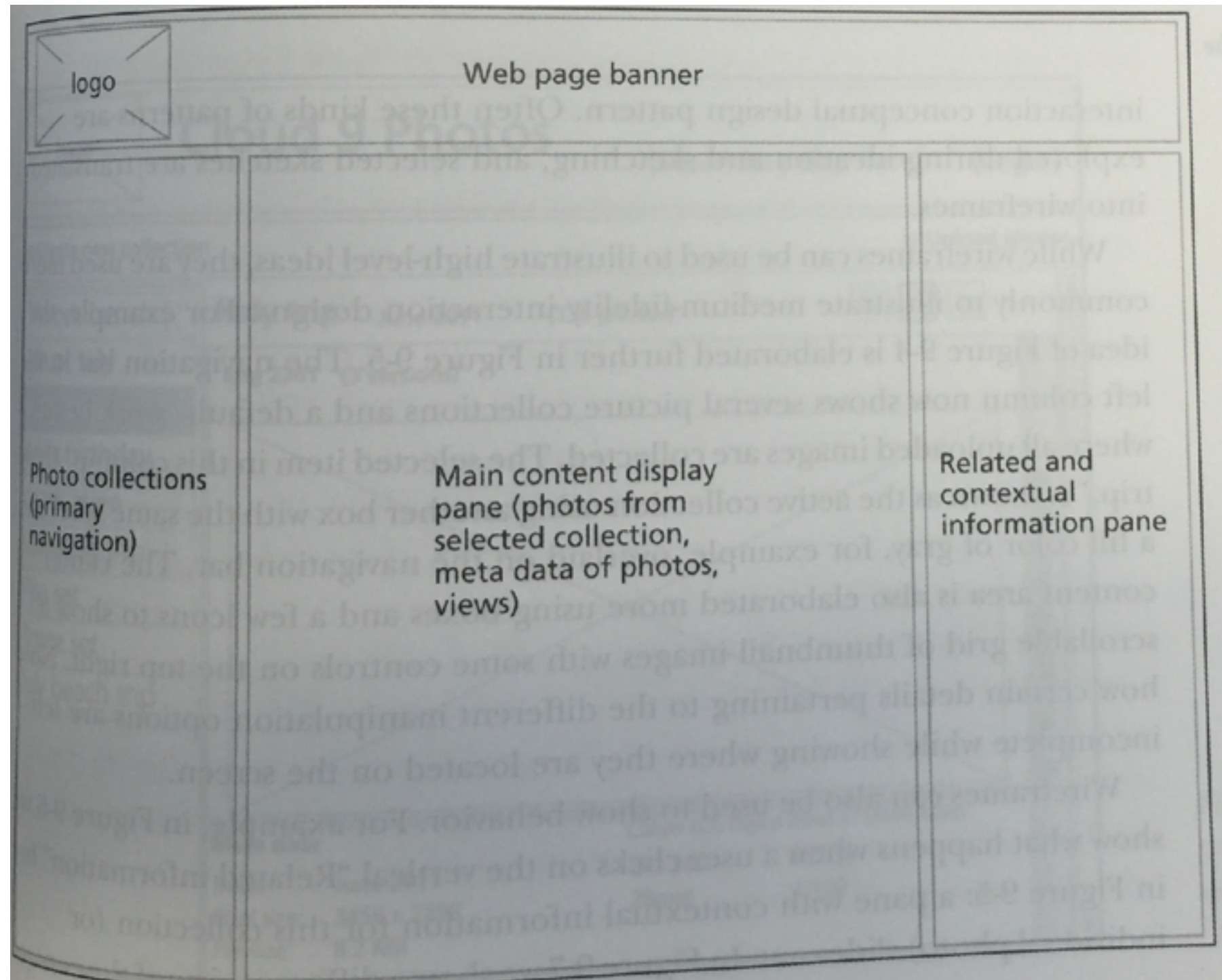
# Wireframes



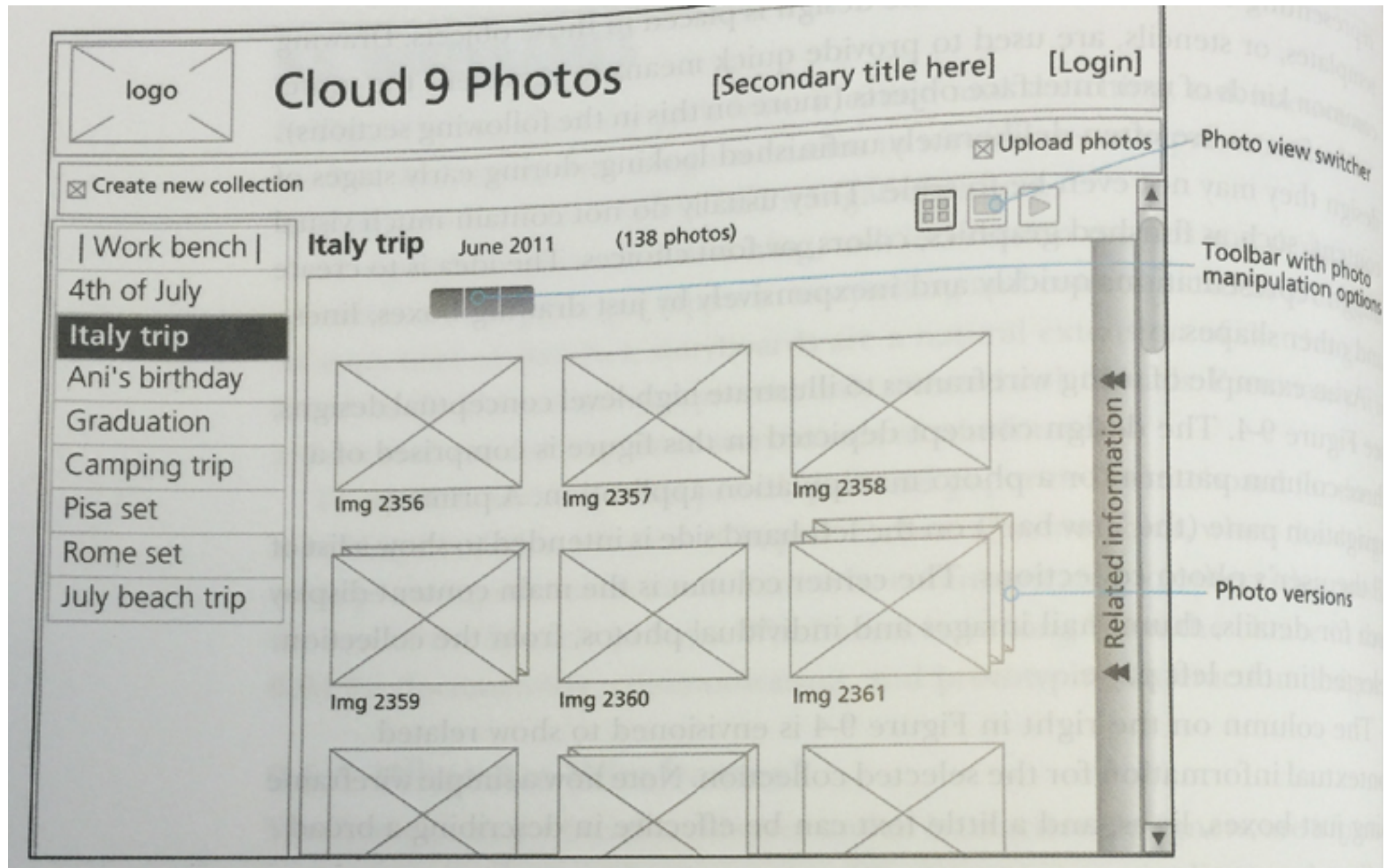
# Wireframes

- Lines & outlines (“wireframes”) of boxes & other shapes
- Capturing emerging interaction designs
- Schematic designs to define screen content & visual flow
- Illustrate approximate visual layout, behavior, transitions emerging from task flows
- Deliberate unfinished: do not contain finished graphics, colors, or fonts

# Example



# Example

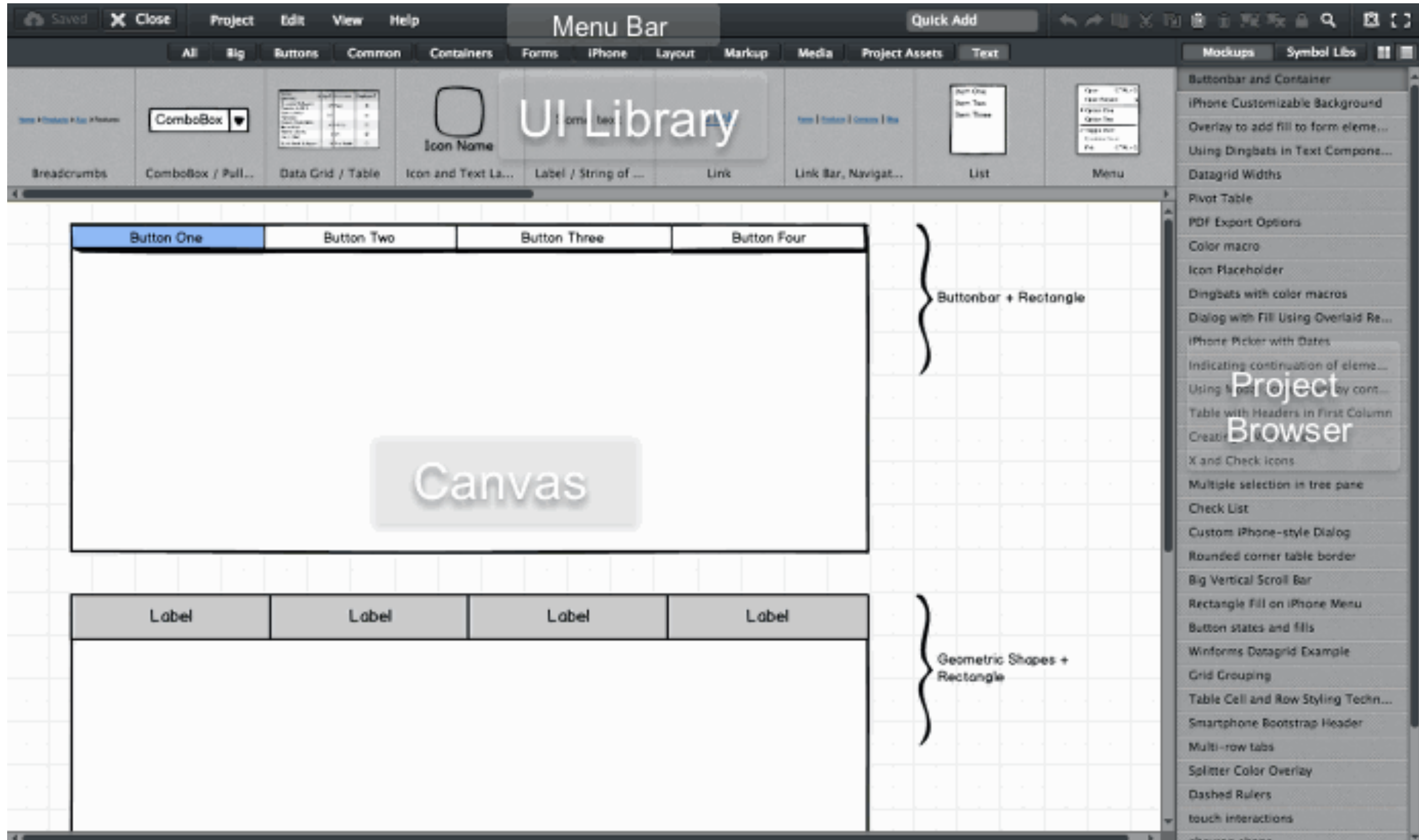




# Wireframes

- Can be used to step through a particular scenario
- Focus on key screens rather than every screen
- Tools can help
  - Can be made clickable
  - Can use stencils & templates; copy & edit similar screens

# Example tool - Balsamiq



# Prototyping



# Prototyping

- How do you know your system design is right before you invest the time to build it?
- Answer: prototyping!
  - Evaluation performed **before** investing resources in building finished product
  - Early version of system constructed much **faster** & with less expense used to evaluate & **refine** design ideas

# Fidelity of prototypes

Kind of Iteration	Purpose	Types of Prototypes
Ideation and sketching	To support exploring ideas, brainstorming, and discussion (so design details are inappropriate)	Sketches, fast and disposable mockups, ultralow fidelity
Conceptual design	To support exploration and creation of conceptual design, the high-level system structure, and the overall interaction metaphor	Evolution from hand-drawn paper, computer-printed paper, low-fidelity wireframes, high-fidelity wireframes, to pixel-perfect interactive mockups (to communicate with customer)
Intermediate design	To support interaction design for tasks and task threads	Evolution from paper to wireframes
Detailed design	Support for deciding navigation details, screen design and layout, including pixel-perfect visual comps complete specification for look and feel of the "skin"	Detailed wireframes and/or pixel-perfect interactive mockups
Design refinement	To support evaluation to refine a chosen design by finding and removing as many UX problems as possible	Medium to high fidelity, lots of design detail, possibly a programmed prototype

# Interactivity of prototypes

- Scripted, click through prototypes
  - Prototype w/ **clickable** links to move between screens
  - Live action storyboard of screens
  - Simulates real **task flow**, but w/ static content
- Fully-implemented prototypes
  - Usually **expensive** to implement actual system
  - But can build key piece of system first to evaluate



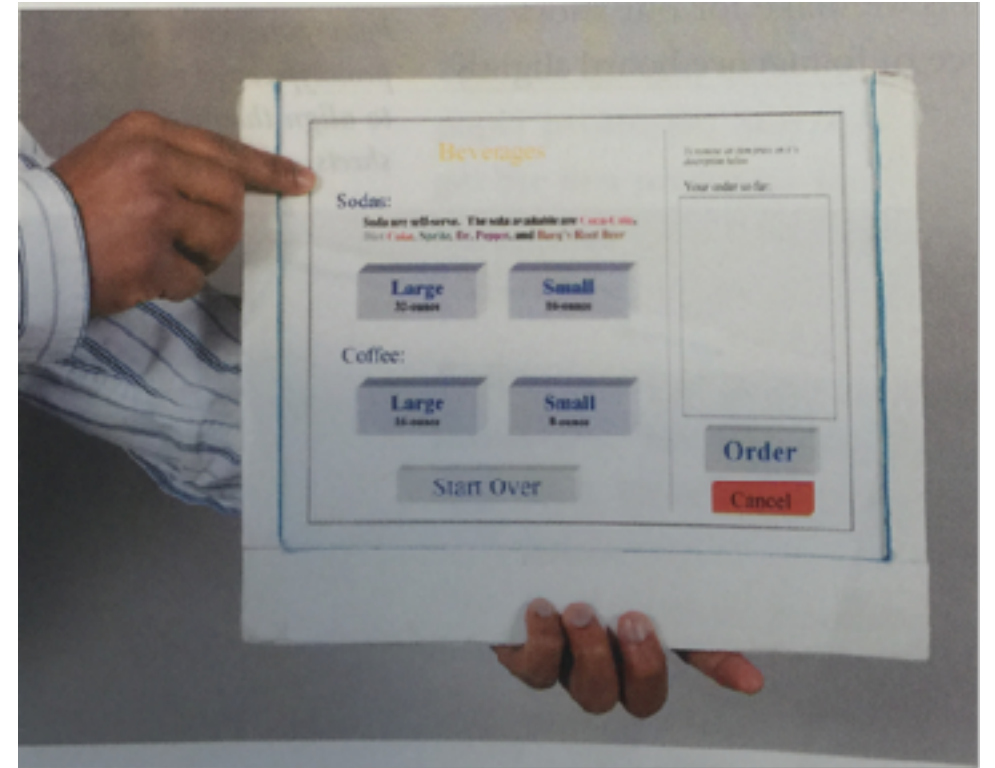
# Wizard of Oz

- Goal: **simulate** actual system w/ out building it
  - Want user to interact **as if** they were interacting w/ real system
  - Helps explore how users would interact w/ novel interaction if it were to exist
- Example: natural command line (Good et al 1984)
  - Users typed in commands to interact w/ computer
  - Commands intercepted by hidden human who interpreted commands & executed them

# Paper prototypes

- **Low fidelity** prototype w/ paper mockups
- Goal: get feedback from users early w/ very low cost interactive prototype of envisioned interaction design

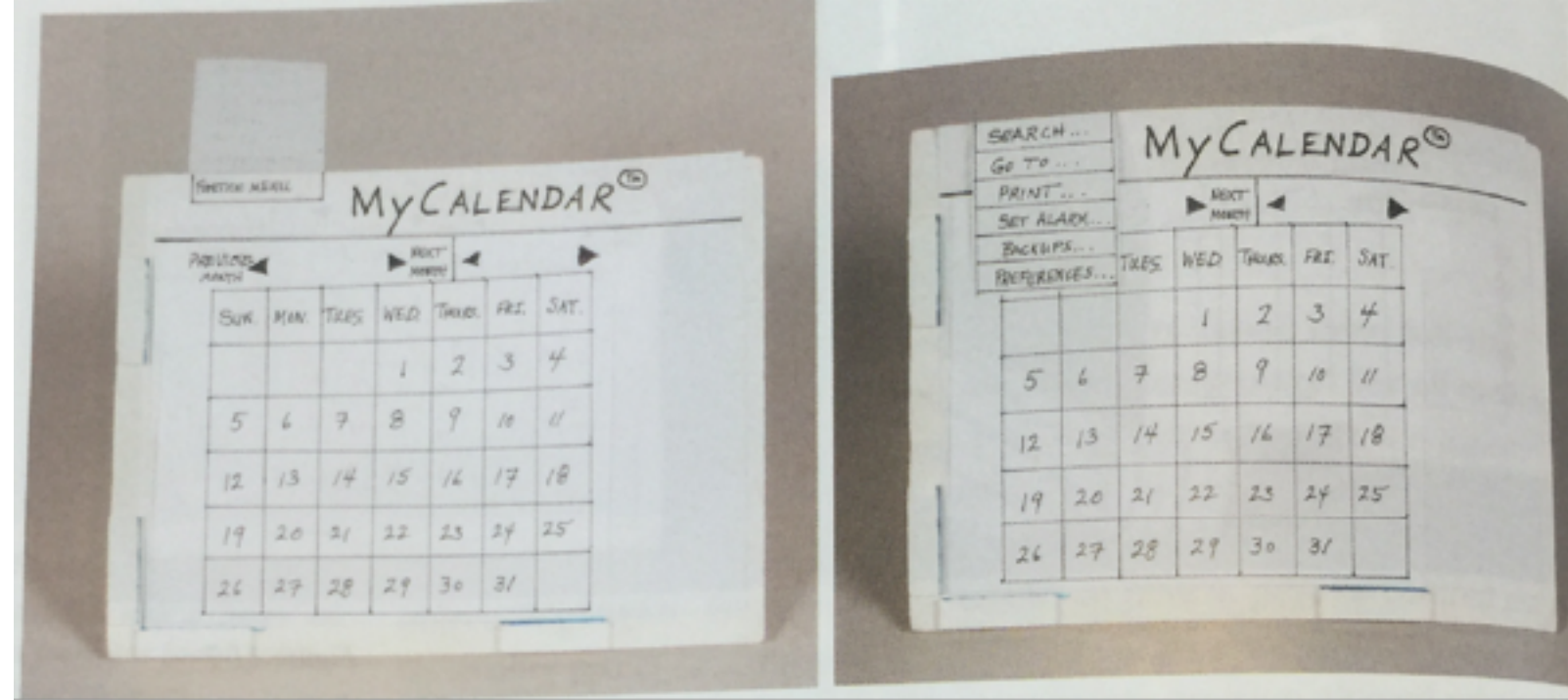
# Paper prototyping (1)



- Set a realistic deadline
- Gather set of paper prototyping materials
- Work **fast** & do not color within the lines
- Reuse existing sketches & mockups
- Make underlying paper mockups of key screens



# Paper prototyping (2)



- Use paper cutouts & tape onto full-size transparencies as “interaction sheets” for moving parts, making modular by including only a small amount
- Do not write or mark on interaction sheets
- Be creative
- Reuse at every level
- Cut corners wherever possible (trade accuracy against efficiency)
- Make a “this feature not implemented” message

# Paper prototyping (3)



- Include “**decoy**” user interface objects not needed for expected tasks
- Accommodate data value entry by users w/ blank transparencies
- **Organize** materials to manage complex task threads
- **Pilot** test thoroughly







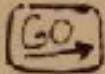
Currently listening to

Video Stage

MASTER CONTROL

Enter a search term

Welcome to VideoStage!

- ① Enter a search term above.
- ② Click on a video to select it.
- ③ Click  to send selected videos to the stage.

SEARCH

FAVORITES






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SEARCH

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Help

Currently listening to

video Stage

MASTER CONTROL

Sports

- ① Enter a search term above.
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SEARCH

FAVORITES





Help

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video Stage

MASTER CONTROL

sports



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Football 14x7



weather

SEARCH

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Spy Satellite



Help

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video Stage

Sports



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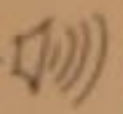


SEARCH

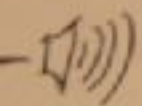
FAVORITES



MASTER CONTROL







MASTER CONTROL

SEARCH

FAVORITES

video Stage

Currently listening to

Help





# Evaluating a Prototype

- After team builds a paper prototype, can run an evaluation on it
- Participants:
  - User
  - Facilitator
  - Computer(s)
  - Scribe

# Paper Prototype Approach

- Design the prototype
  - Work fast (sketchy)
  - Design for interactivity - use separate pieces of paper for everything, tape, post-it notes, transparencies — things that are easy to manipulate
- Prepare scenario - specific tasks
- Assign team members to roles
- Practice



# Paper Prototype Approach

- Run experiment
  - Facilitator gives instructions for tasks and asks for “think aloud” comments from participant
  - Computer(s) respond to participants interactions
  - Scribe silently takes notes
  - Team members debrief participant after the experiment is over
- Analyze results, design changes, repeat

# Advantages of prototyping

- Offers concrete baseline for communication between users & designers
- Provides conversation “prop” to communicate concepts
- Allows user to “take design for a spin”
- Give project visibility & buy-in with customers
- Encourage early user participation and involvement
- Give impression that design is easy to change
- Afford designers immediate observation of user performance & consequences of design decisions

# Disadvantages of Lo-Fi Prototypes

- Very rough appearance - can't be used to find detailed layout/design issues
- Does not reflect the actual speed of your system (and responsiveness)
- Human computer's logic may be difficult to capture in code
- Limited scenarios

# Variation: Concept Videos

- To get higher realism, can also create non-interactive concept videos
- Act out scenarios to show human context and where interactions fit in





# LiveSlides web content

To view

**Download the add-in.**

[liveslides.com/download](https://liveslides.com/download)

**Start the presentation.**



# Hi-fi design concept video example

- This video was produced (from concept to final cut) in *six weeks*
- More info at <http://www.dubberly.com/articles/the-making-of-knowledge-navigator.html>

# Conceptual Design of Transit Card Vending

- Design an interface for a machine that vends transit cards
- The machine accepts cash, coins, and credit cards
- The machine sells and reloads transit cards
- Transit cards can be loaded with:
  - Passes - valid for unlimited travel in the given period (1,7,30 days)
  - Value - Direct proxy for cash, used to pay fares
- Things to think about:
  - How does user decide to reload vs buy new card?
  - Can a card have both value and a pass on it? How does that work?