

Interaction Design

Chapter 5 (June 8th, 2011, 9am-12pm):
Sketching Interaction

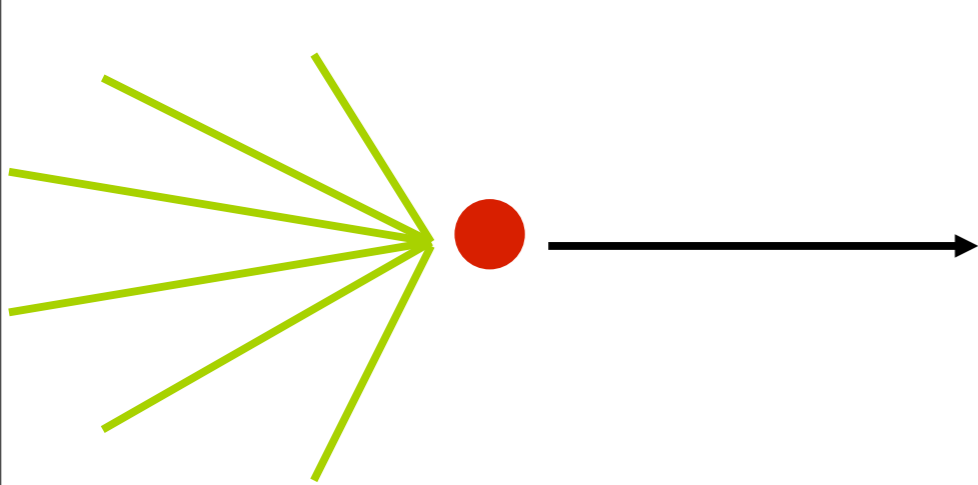
Sketching Interaction

- The Definition of Sketching
- Characteristics of Sketches and Sketching
- Sketches and Prototypes
- Is it a Sketch ?
- Sketching Techniques
- Storyboarding
- Visual Thinking and Video Sketching

Recap:

ANALYSIS

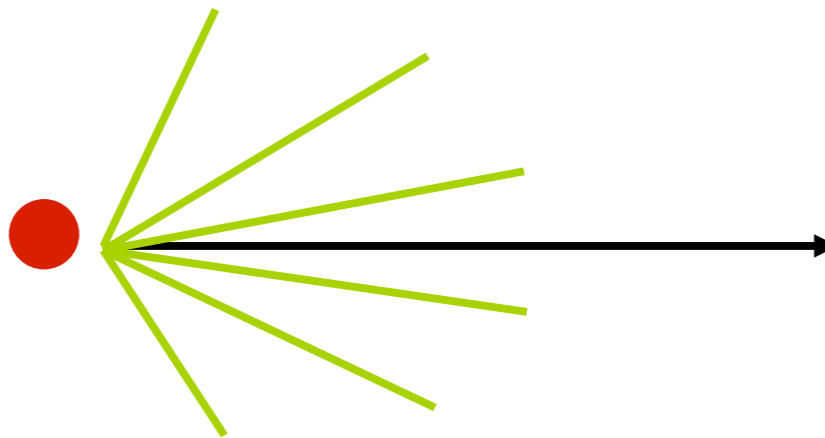
Definition of the system
What is the problem?



The designer is a
'problem-scouter'

EVALUATION

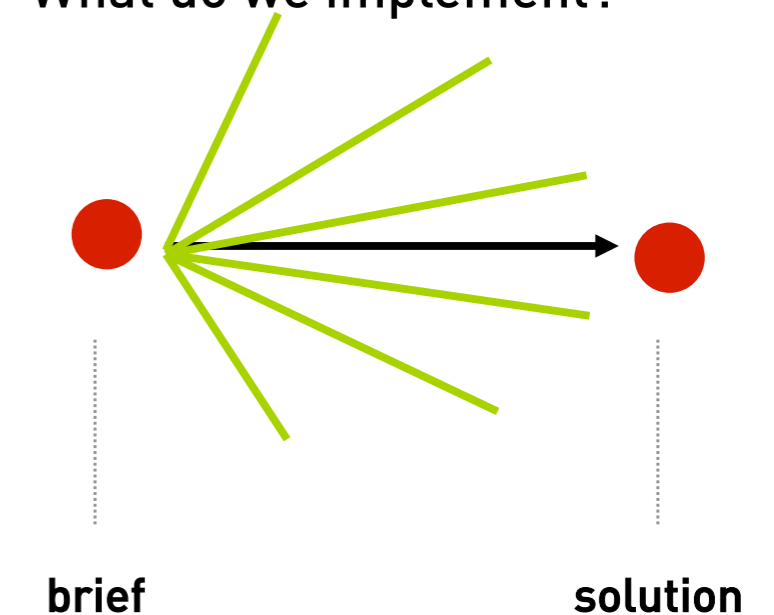
Possible alternatives
What future do we want?



The designer is a
'story-teller'

SYNTHESIS

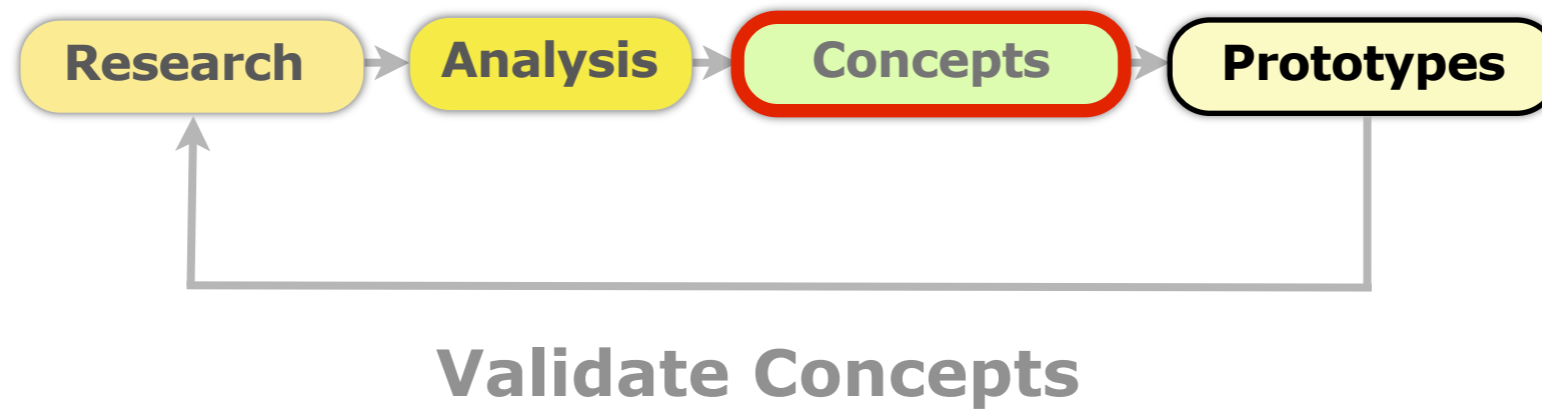
Design of final solutions
What do we implement?



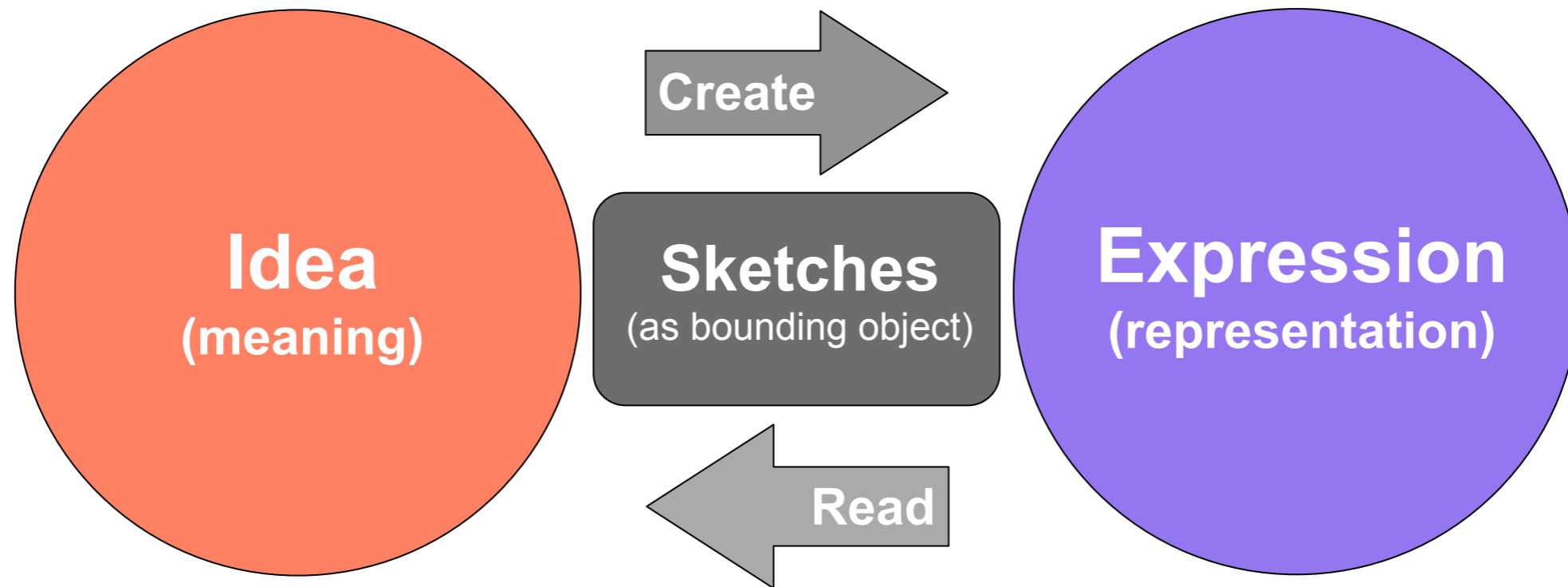
The designer is an
'executor'

source: [4]

Recap:



source: [4]



Sketching is an activity, where design ideas arise from action in the dialog (personal as well as collective) with the situation at hand

In this **dialectic process** the coupling between design idea and design expression will be established and transformed

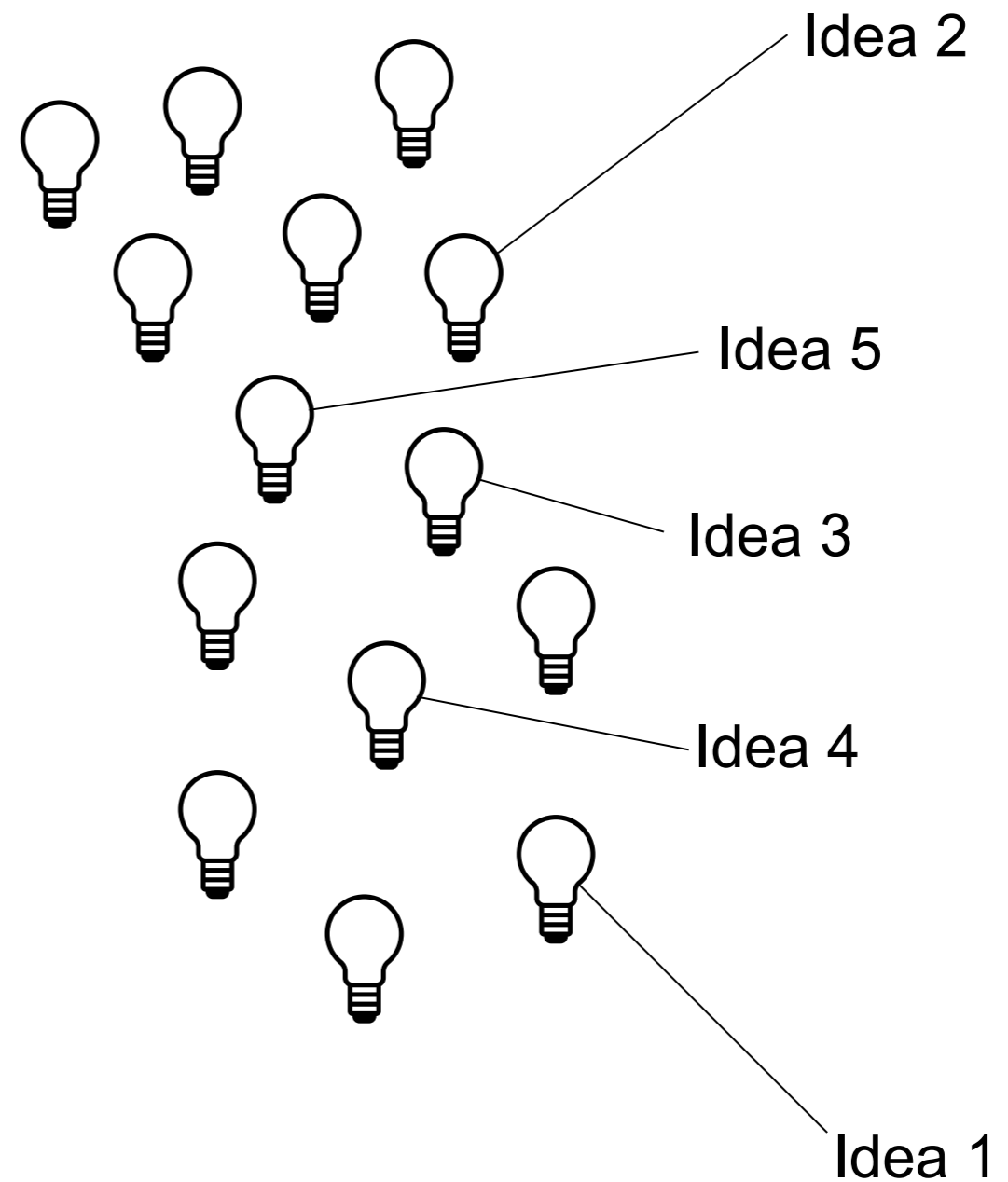
source: [1]

Why Sketches

Getting the Design Right:

(a) **Generate** an idea &

(b) Iterate and **develop** it



source: [1]

Why Sketches

Getting the Right Design:

Design in **wicked situations**:

not just define a solution, but also define design space is part of the game

Typically, we tend to fixate on first idea:

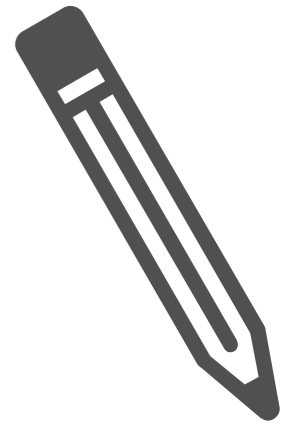
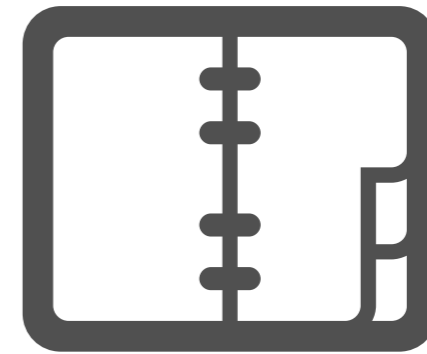
Sketching is a strategy, **not making premature commits**, but exploring the design space:

- (1) generate many **ideas and variations**
- (2) **reflect** and choose
- (3) then **iterate and develop** your choice

source: [1]

Why is sketching useful?

- **Early** ideation
- **Think** through ideas
- **Force** you to visualize how things come together
- **Communicate** ideas to others to inspire new designs
- **Active** brainstorming



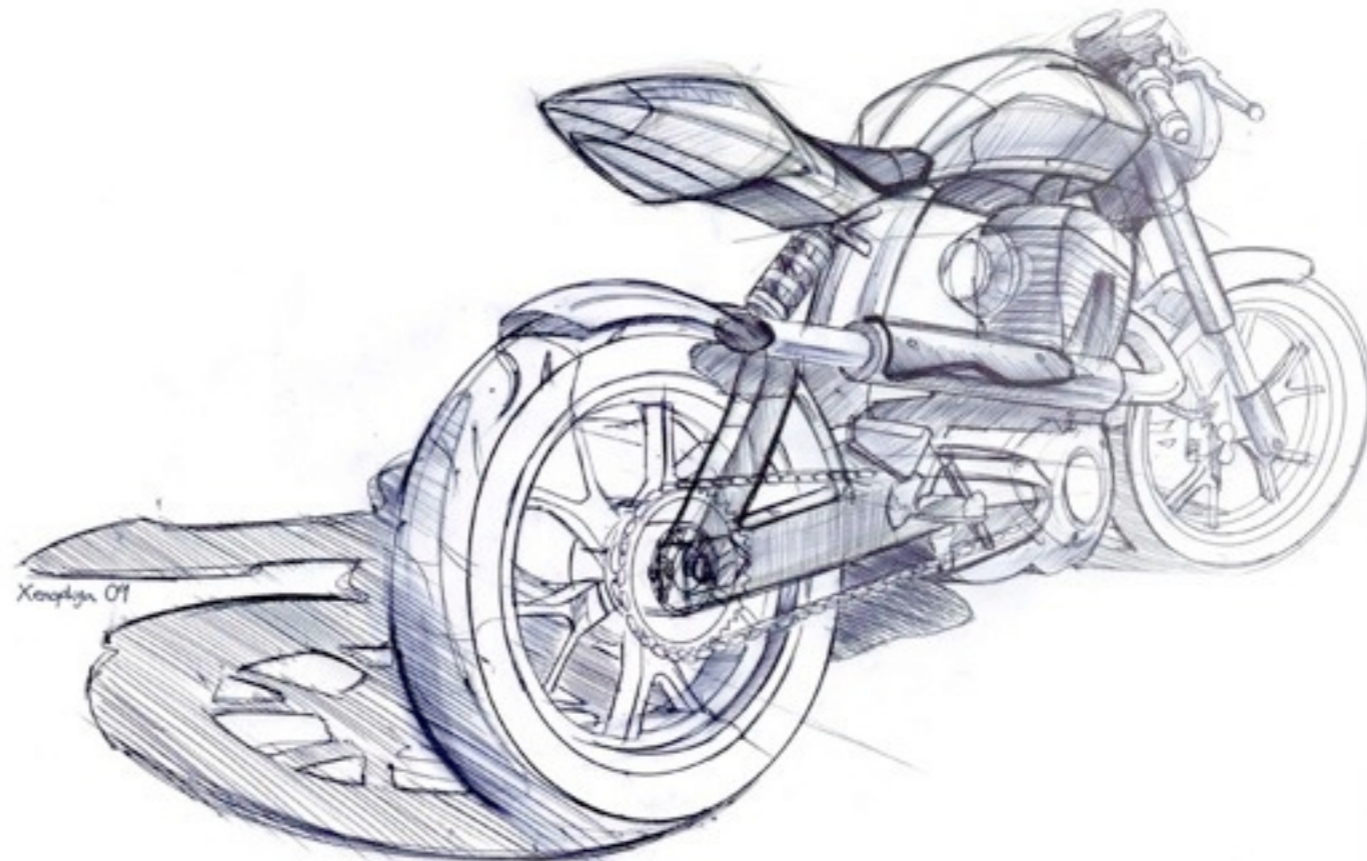
source: [6]

Sketching Interaction

- The Definition of Sketching
- Characteristics of Sketches and Sketching
- Sketches and Prototypes
- Is it a Sketch ?
- Sketching Techniques
- Storyboarding
- Visual Thinking and Video Sketching

Buxton's Sketch Properties

- Quick
- Timely
- Inexpensive
- Disposable
- Plentiful
- Clear vocabulary
- Distinct gesture
- Minimal detail
- Appropriate degree of refinement
- Suggest and explore rather than confirm
- Ambiguity



source: [1]

Quick

- A sketch is **quick to make**, or at least gives that impression



Timely

- A sketch can be **provided when needed**



source: [1]

Inexpensive

- Cost must not inhibit the **ability to explore a concept**, especially early in design



Prototyping an architect's computer with the help of a Pizza-box [E10 Apple Design Project, 1992].

source: [1]

Disposable

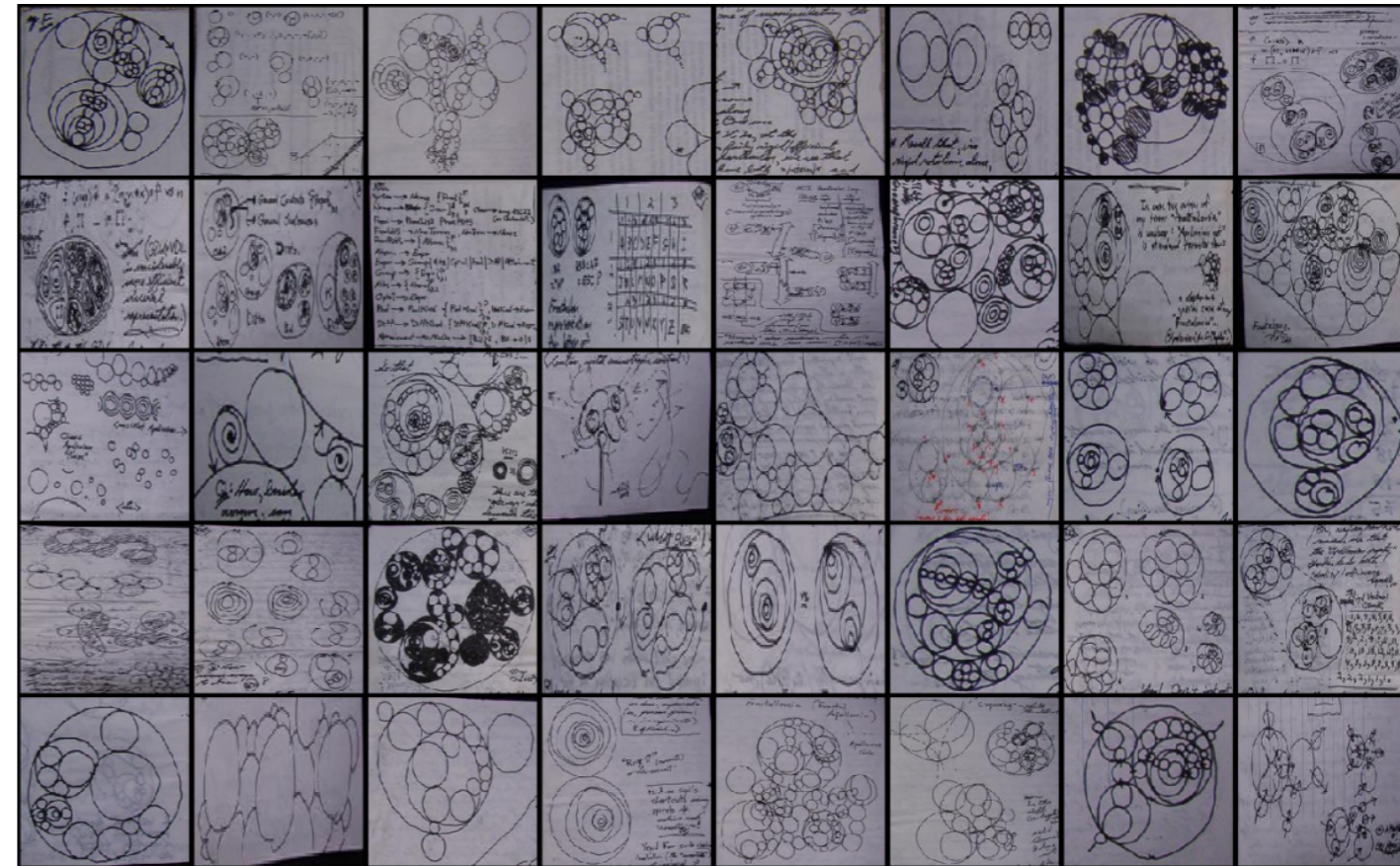
- If you can't afford to **throw it away**, it's not a sketch
- **Investment is in the process**, not the physical sketch
- However, not **“worthless”**



source: [1]

Plentiful

- They don't exist in isolation
- Meaning & relevance is in the context of a collection or series

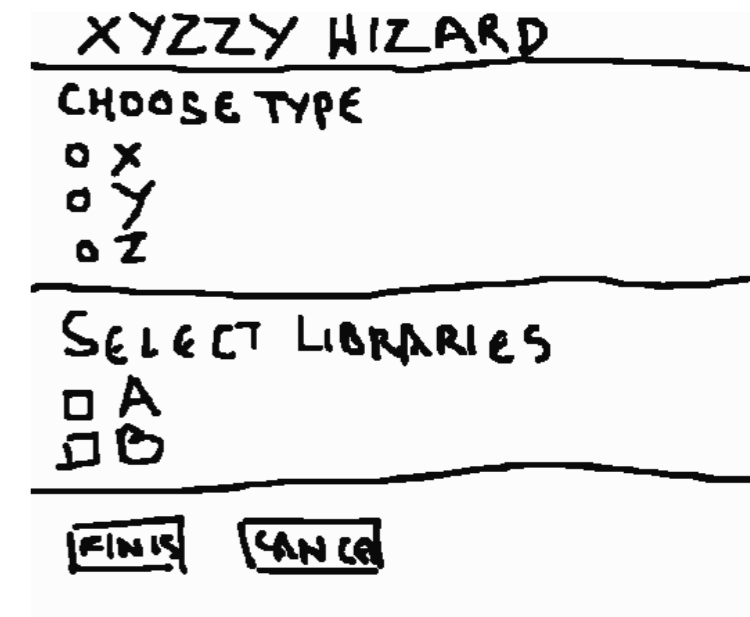


source: [1]

Clear vocabulary

- The way it's rendered (e.g., style, form, signals) makes it **distinctive** that it is a sketch

(This matter is also responsible for receiving different feedback from the indented user in early tests)

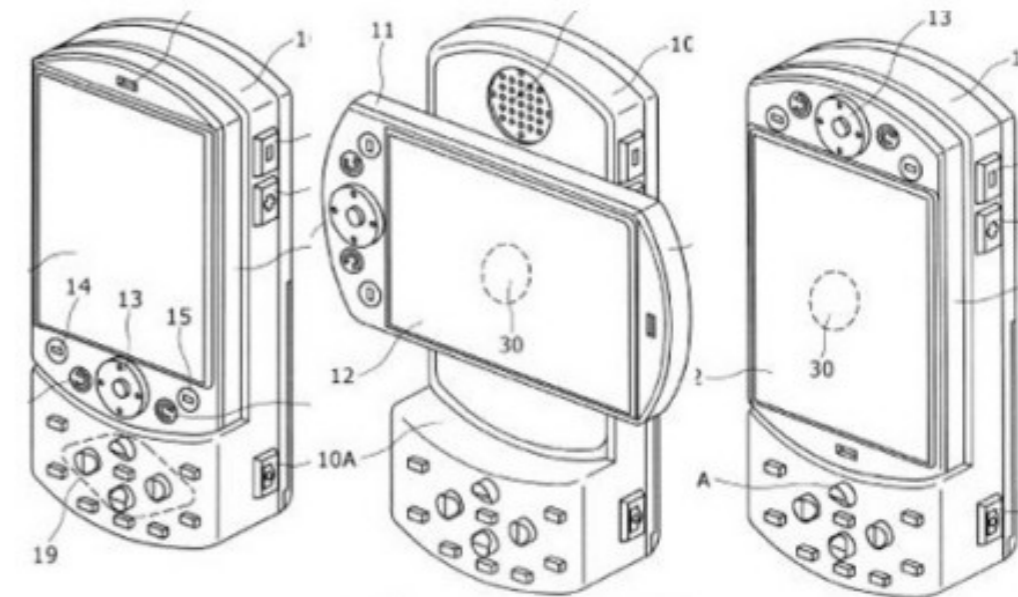
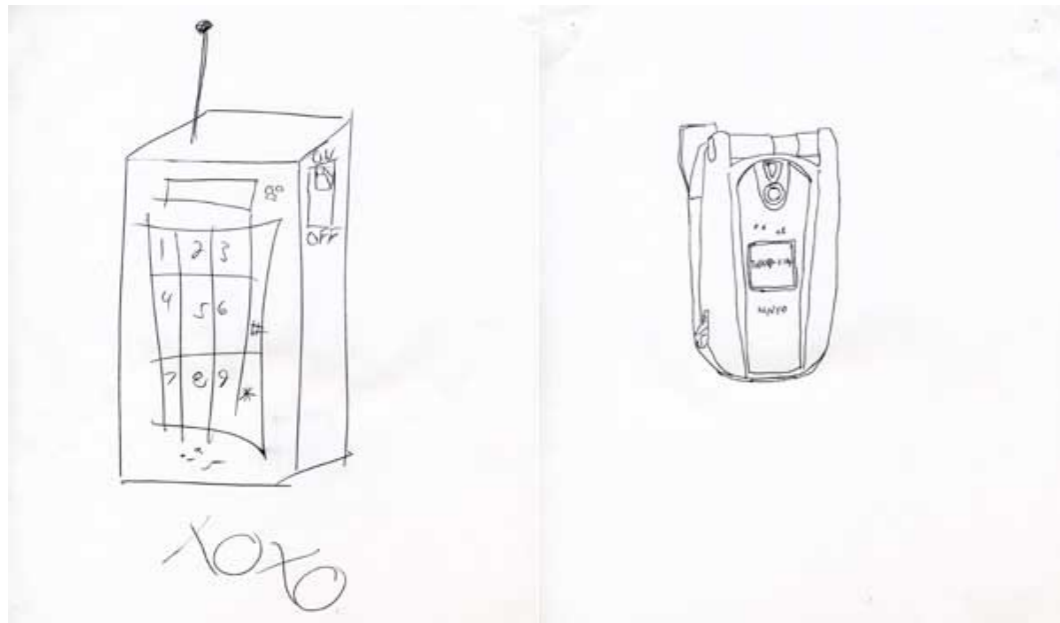


source: [1]

Distinct Gesture

- Fluidity of sketches gives them a **sense of openness and freedom**

(Opposite of engineering drawing, which is tight and precise)



source: [1]

Minimal Detail

- Include **only what is required** to render the intended purpose or concept



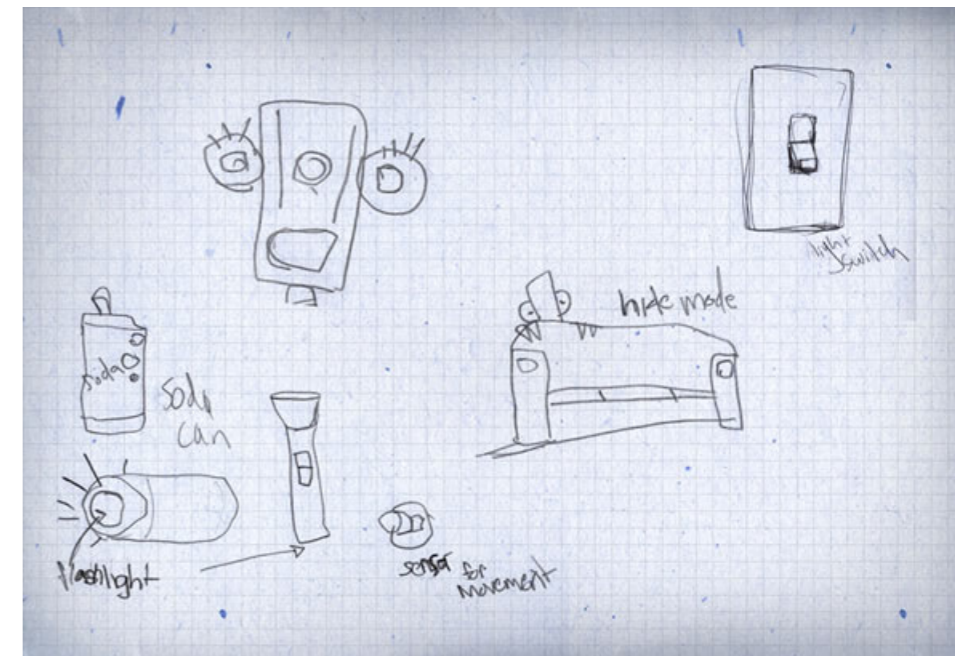
source: [1]

Appropriate Degree of Refinement

- Make the sketch be as refined as the idea:

(a) If you have a **solid idea**, make the sketch look **more defined**

(b) If you have a **hazy idea**, the sketch will look much **rougher and less defined**



source: [6]

Suggest and explore rather than confirm

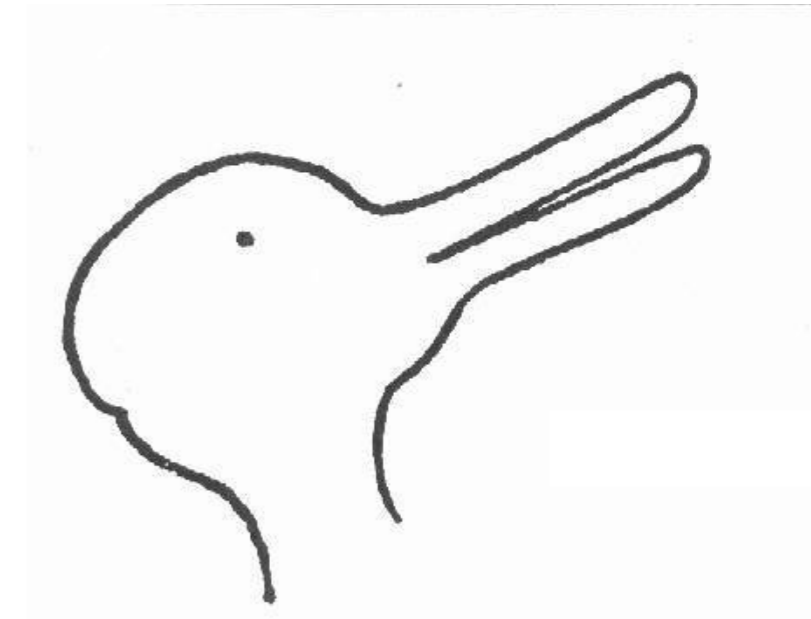
- Sketch should act as a **catalyst** to the desired and appropriate **behaviors, conversations, and interactions**



source: [6]

Ambiguity

- Intentionally **ambiguous**
- Value comes from being able to be **interpreted in different ways**, even by the person who created them



source: [1]

Sketching Interaction

- The Definition of Sketching
- Characteristics of Sketches and Sketching
- Sketches and Prototypes
- Is it a Sketch ?
- Sketching Techniques
- Storyboarding
- Visual Thinking and Video Sketching

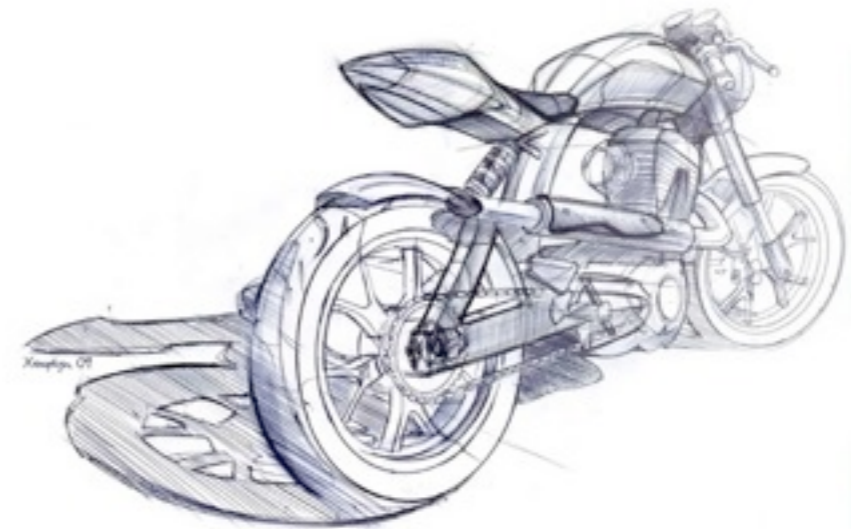
Sketching vs. Prototyping

Sketches

- Invite ↔
- Suggest ↔
- Explore ↔
- Question ↔
- Propose ↔
- Provoke ↔

Prototypes

- Attend
- Describe
- Refine
- Answer
- Test
- Resolve



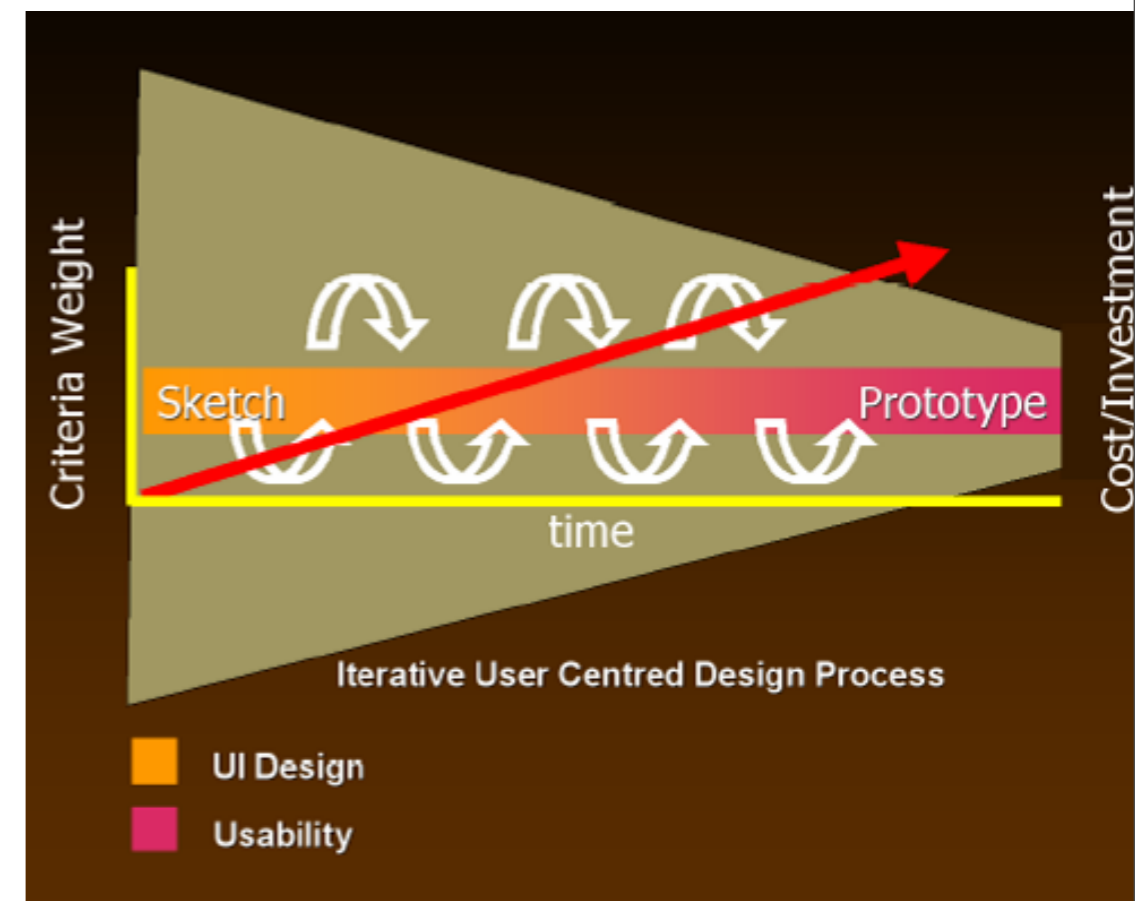
Sketching and Prototyping

Low cost sketches

as investment in design increases (red arrow), exploring the design space from the **user interaction point of view**

From design to evaluation

similarly, interface design (idea generation) progresses to usability testing (evaluate a design idea)



source: [1]

Forms of sketching

Buxton properties don't mention anything about form factor

- Can be pencil/pen drawing on paper
- Something scraped together in Photoshop
- Quick-and-dirty prototyping
- Magazine cut-outs
- Modifications to existing objects

source: [6]

The Sketchbook

Why a sketchbook?

- capture many initial ideas – **both good and bad**
- **explore & refine** ideas both in the large and in the small
- **develop variations**, alternatives, details
- **keep a record** of your ideas
- **reflect** on changing thought processes over time
- **communicate ideas** to others by showing
- **choose** ones worth developing
- capture good ideas you **see elsewhere**
- **collect** photos, tape them into your book



source: [6]

Sketchbook examples

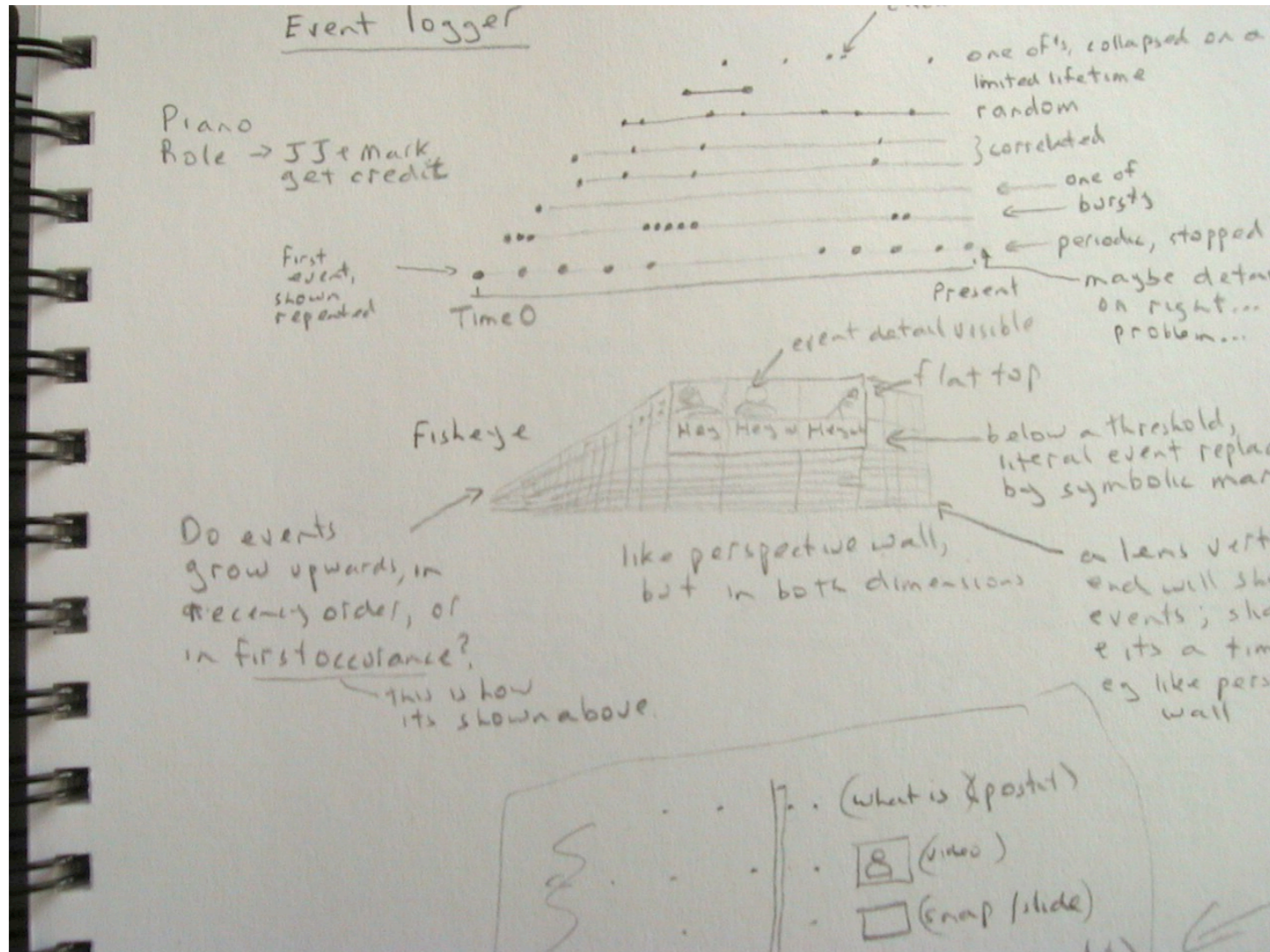


Artist variations studies

artist's sketch page <http://www.fmhs.cnyric.org/art/StudioFoundation/Sketchbook/sketchbook.html>

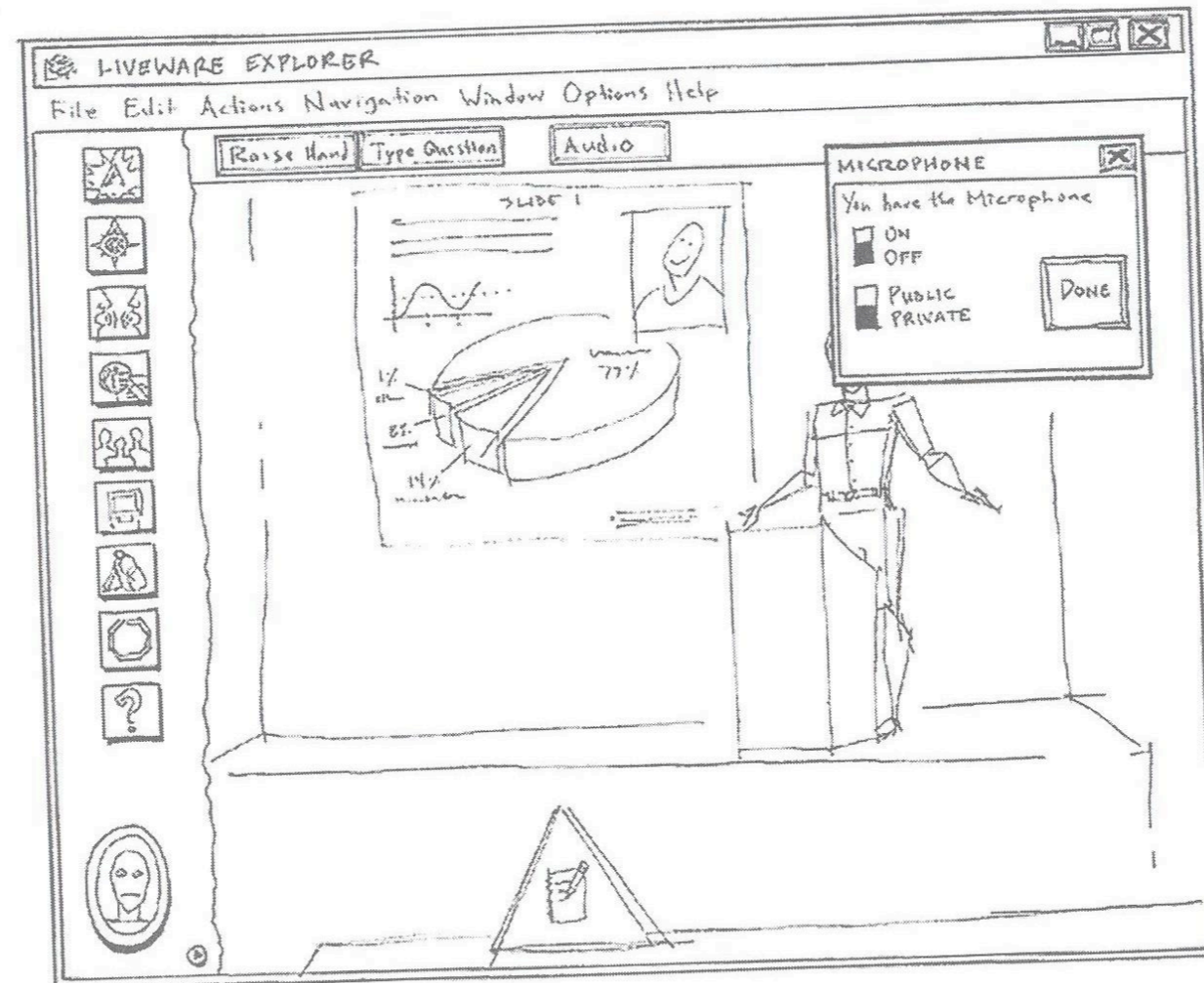
source: [6]

Sketchbook examples



crude drawings & annotations

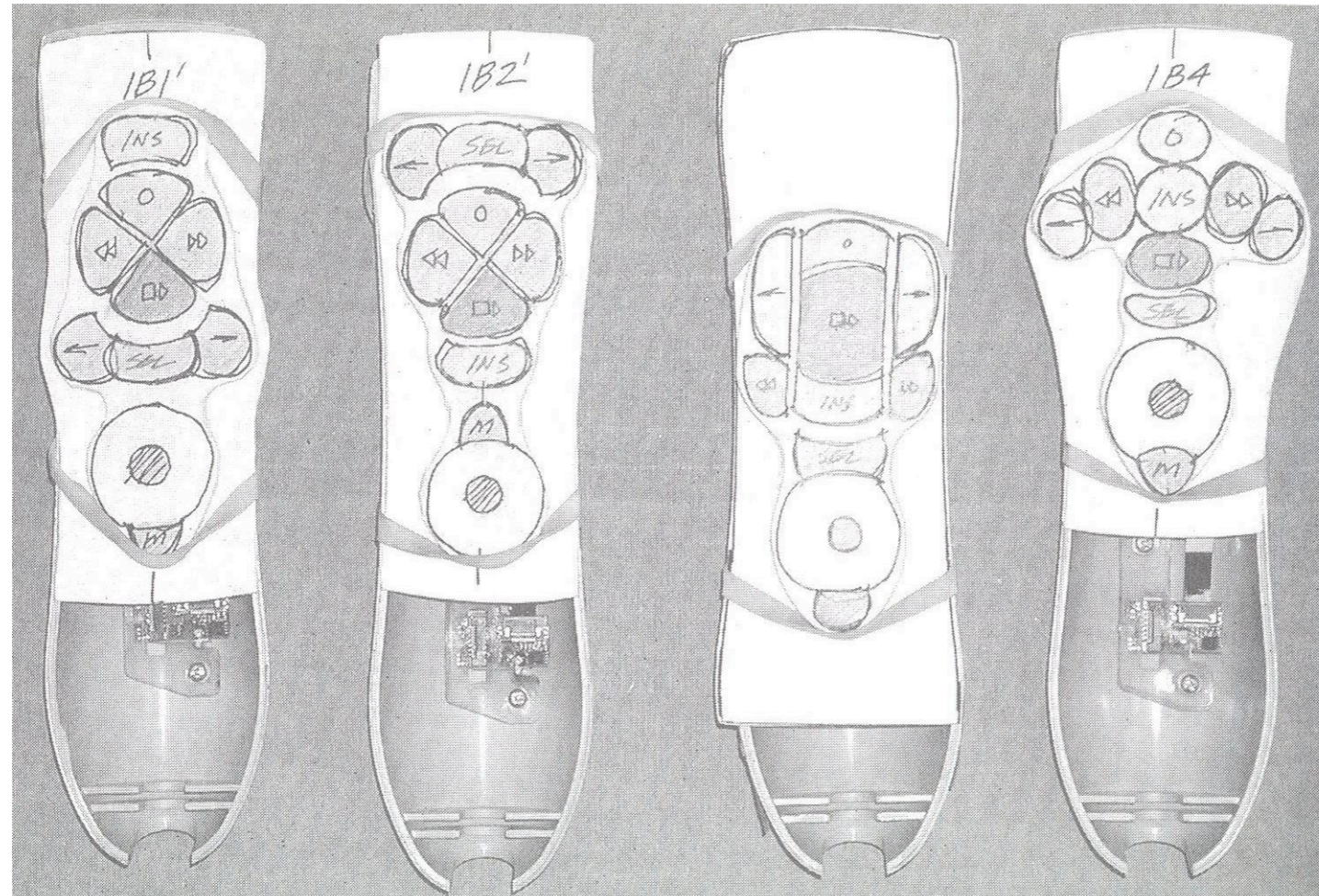
Sketchbook examples



Screenshot

source: [5]

Sketch examples – design variations



source: [5]

Sketch examples - Storyboard Translations

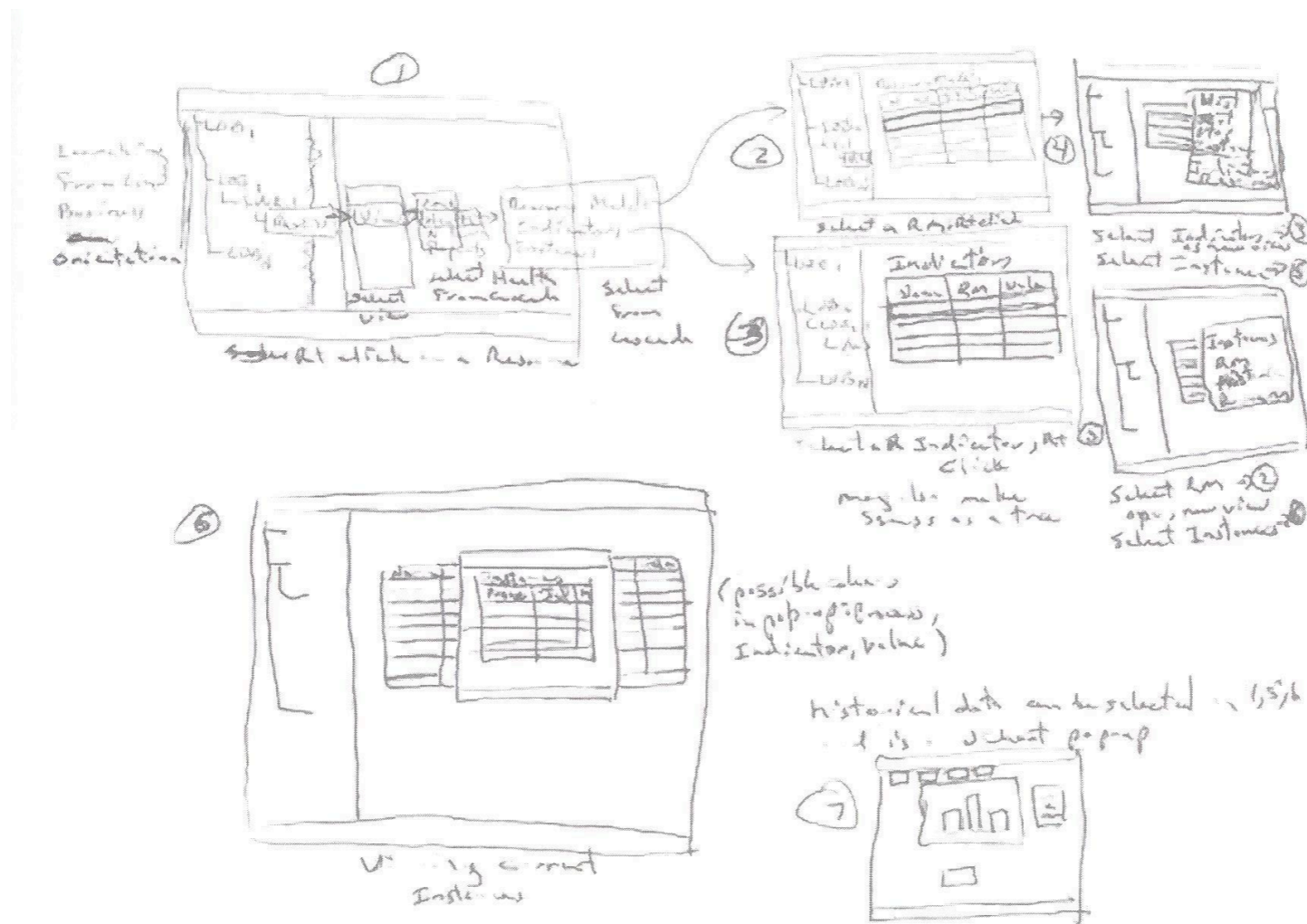
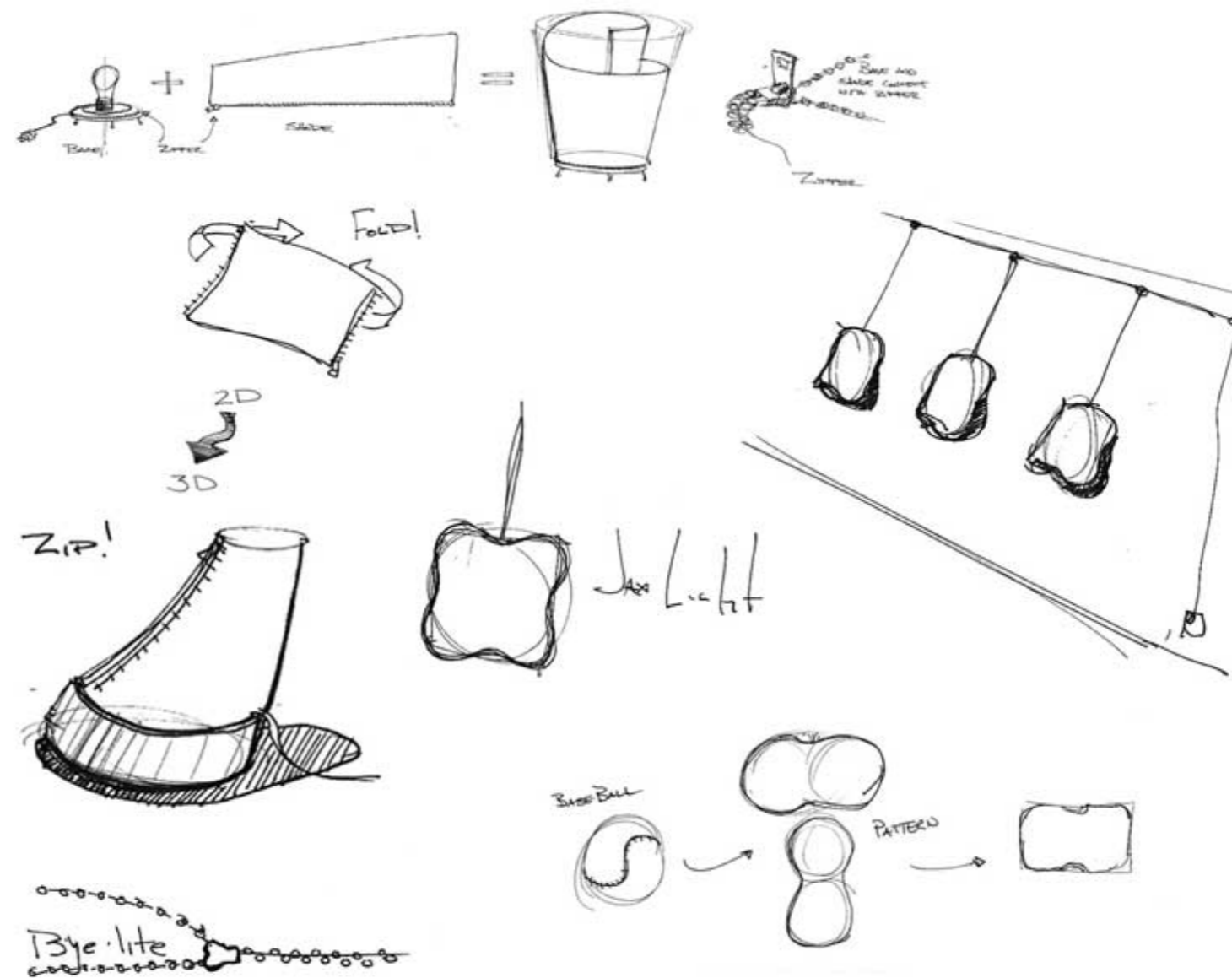


Figure 4.14. A storyboard showing a sequence of seven screens for a user interface.

Sketching Interaction

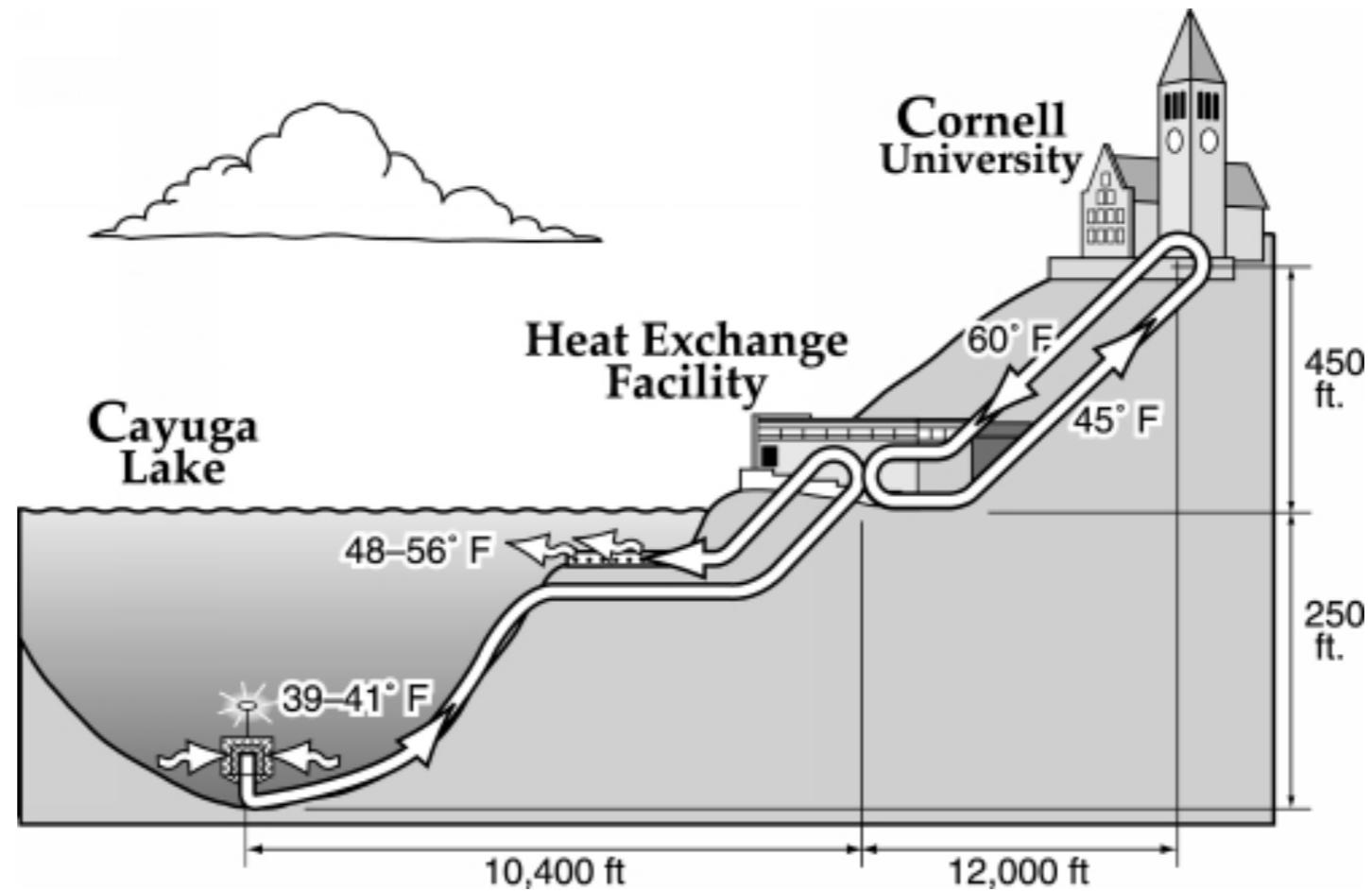
- The Definition of Sketching
- Characteristics of Sketches and Sketching
- Sketches and Prototypes
- Is it a Sketch ?
- Sketching Techniques
- Storyboarding
- Visual Thinking and Video Sketching

Is this a sketch? Why or why not?



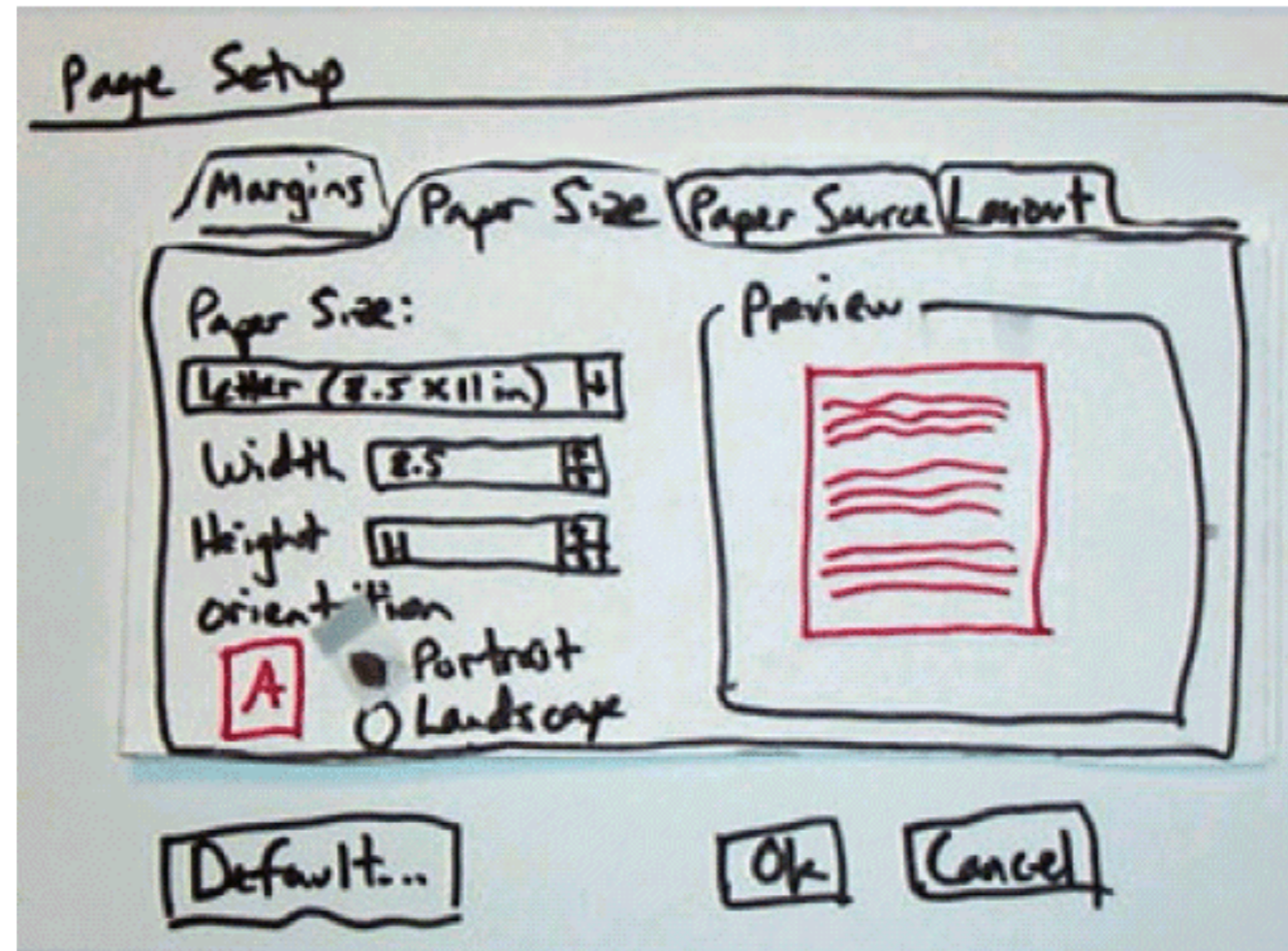
source: [6]

Is this a sketch? Why or why not?



source: [6]

Is this a sketch? Why or why not?



source: [6]

Is this a sketch? Why or why not?



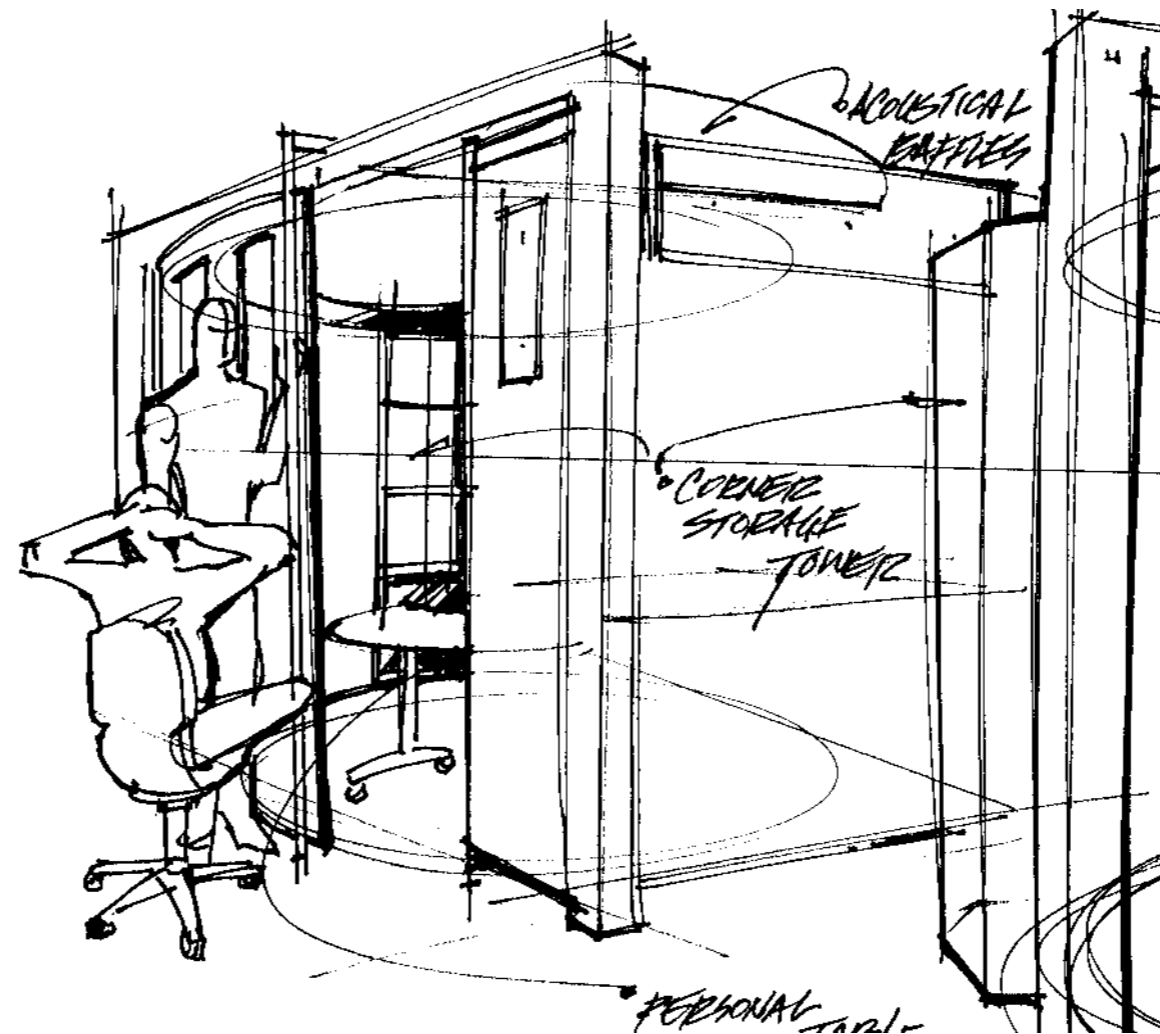
source: [6]

Is this a sketch? Why or why not?



source: [6]

Is this a sketch? Why or why not?



source: [6]

Sketching Interaction

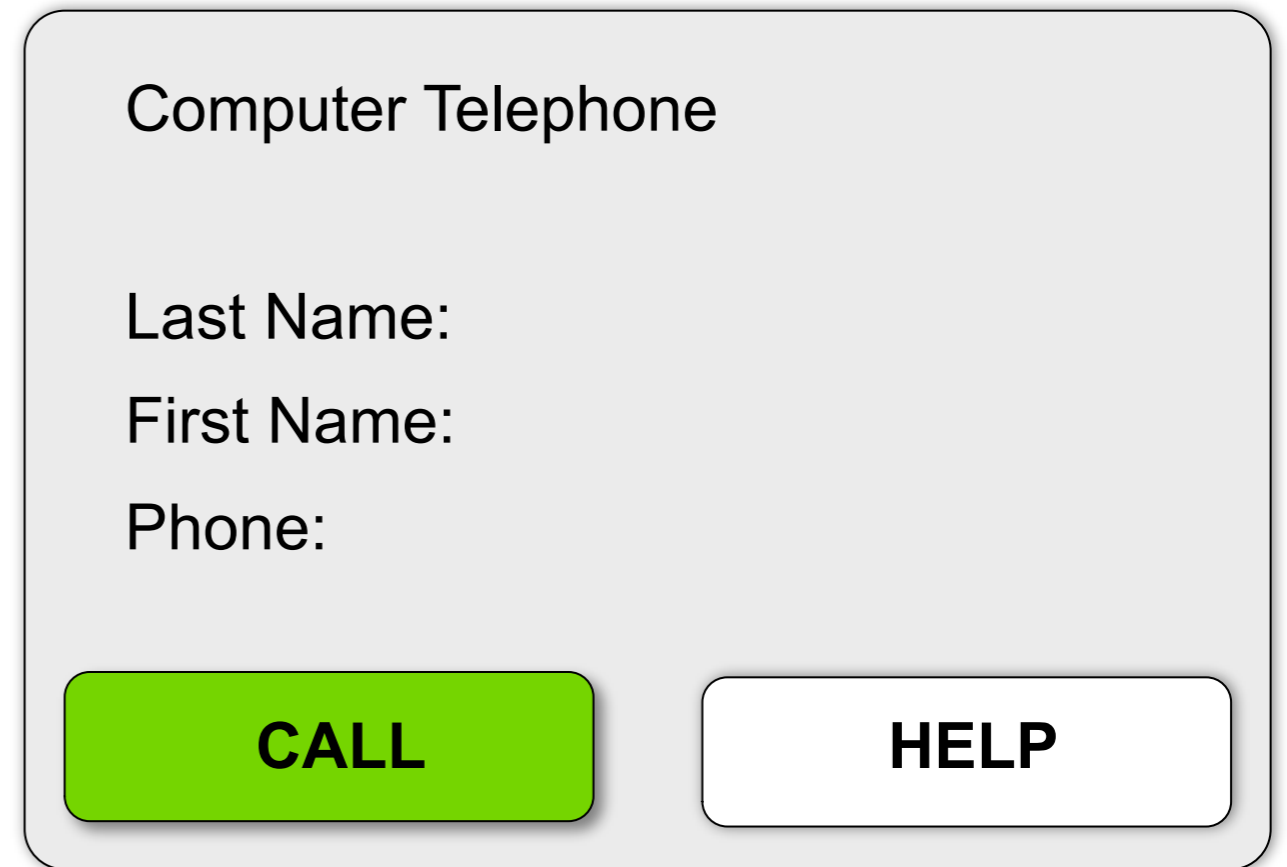
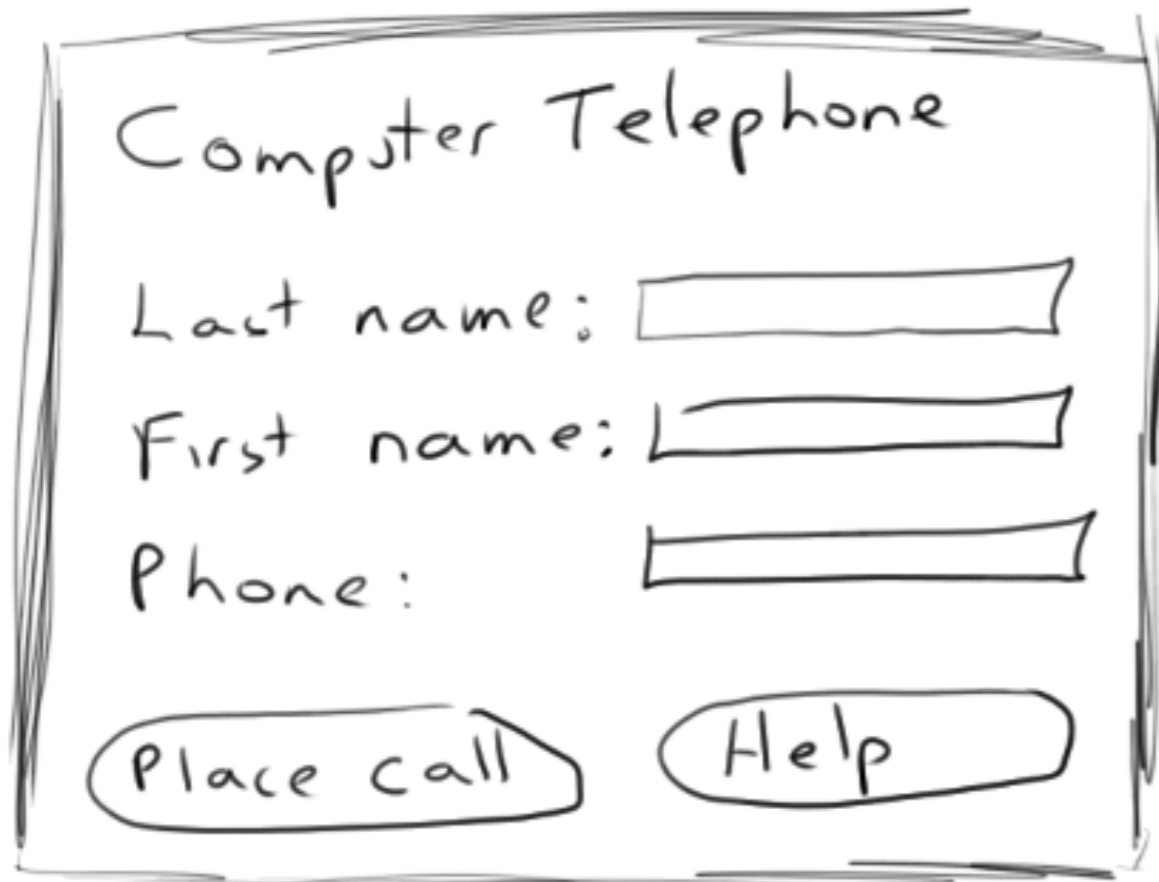
- The Definition of Sketching
- Characteristics of Sketches and Sketching
- Sketches and Prototypes
- Is it a Sketch ?
- Sketching Techniques
- Storyboarding
- Visual Thinking and Video Sketching

Technique: Reduce to essentials

How much fidelity do we really need?

- **Constrained resolution**
 - no higher than required to capture its concept
- **Consistency with state**
 - rendering fidelity matches the actual state of development of the concept
- **Suggest & explore rather than confirm**
 - suggests and provokes what could be
- **A catalyst**
 - evokes conversations and discussion

source: [6]



Low Fidelity

High Fidelity



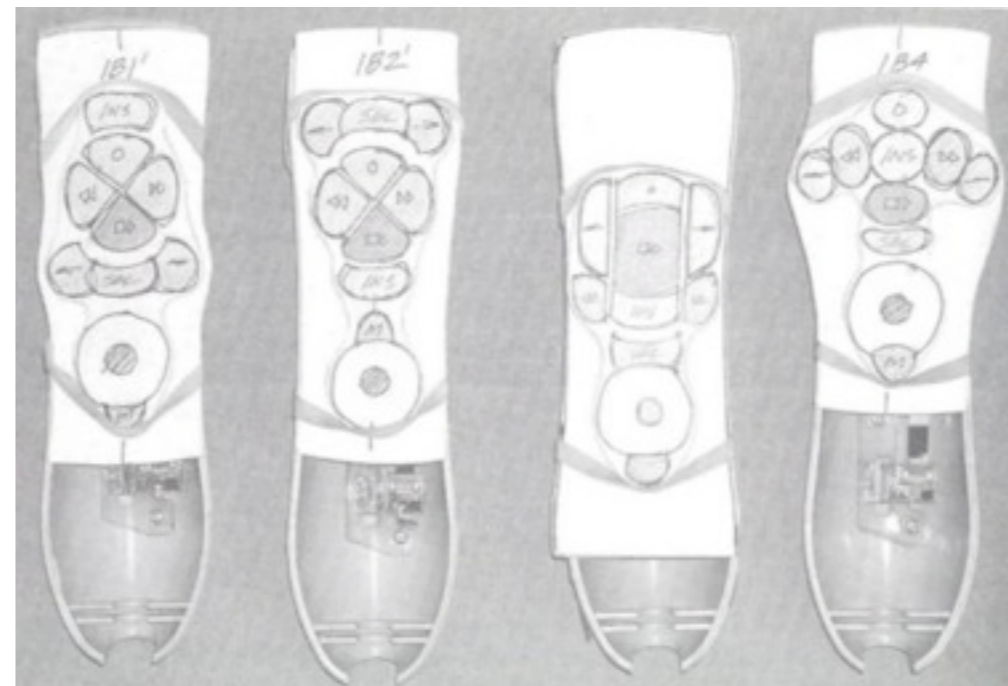
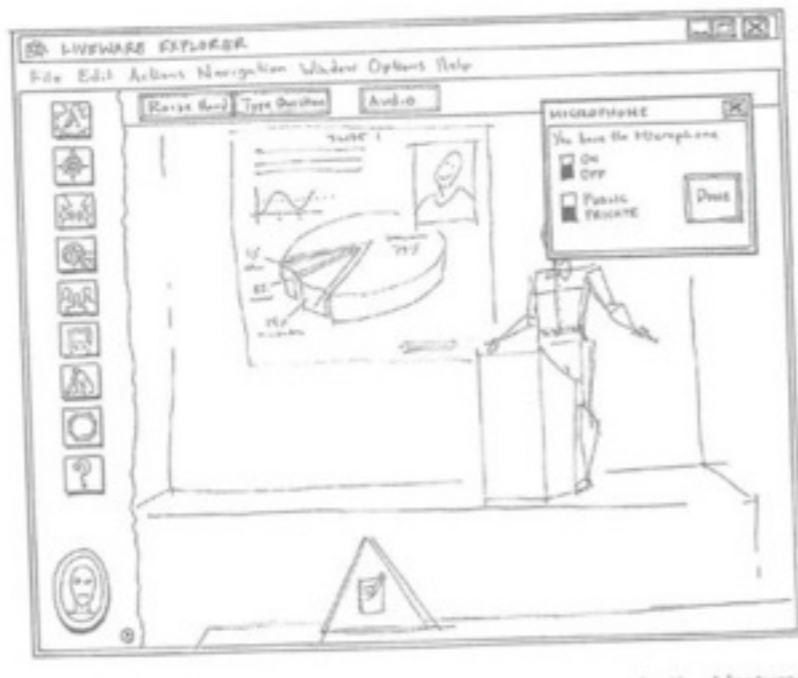
source: [6]

Technique: Reduce to essentials

- **Scribble drawing**
 - sketch anywhere, anytime,
 - sketch in the dark (while watching a movie)
 - speed sketching (1 minute or less)
- **Trick**
 - draw only essentials
 - scribbles suggest details

Sketching moments in time

- Captures:
- an essence of an idea
- a moment in time
- the look of an interface
- multiple variations of the concept



source: [5]

Technique: Tracing

source: [1]

Technique: Tracing

- **Basic idea**
 - copy / trace the fixed elements of an existing interface/screen
- **Technology**
 - camera, photograph, tracing paper or...
 - Photoshop or equivalent (trace over image on a separate layer)
- **Drawing skill required**
 - almost zero

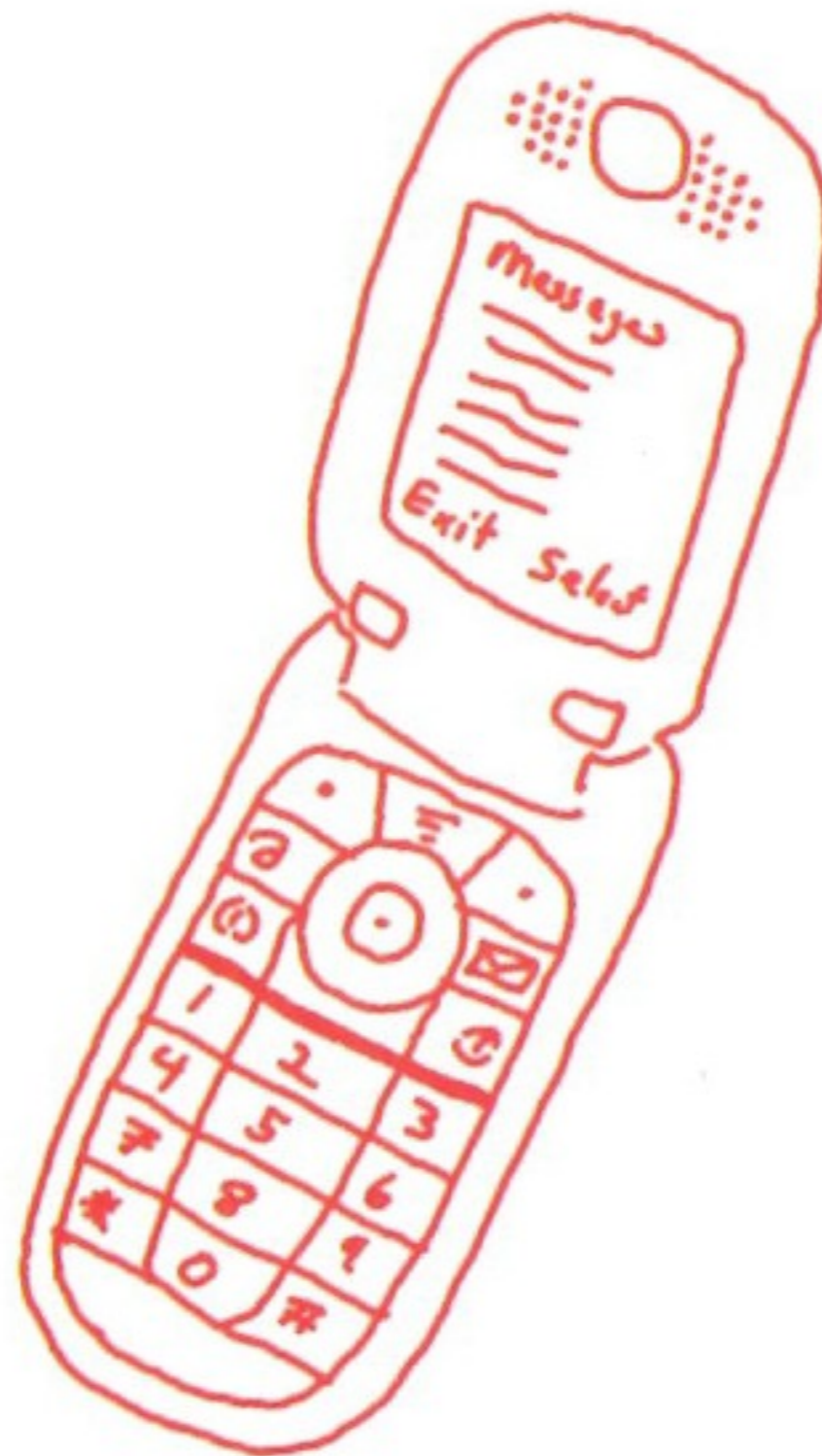
source: [1]



source: [1]



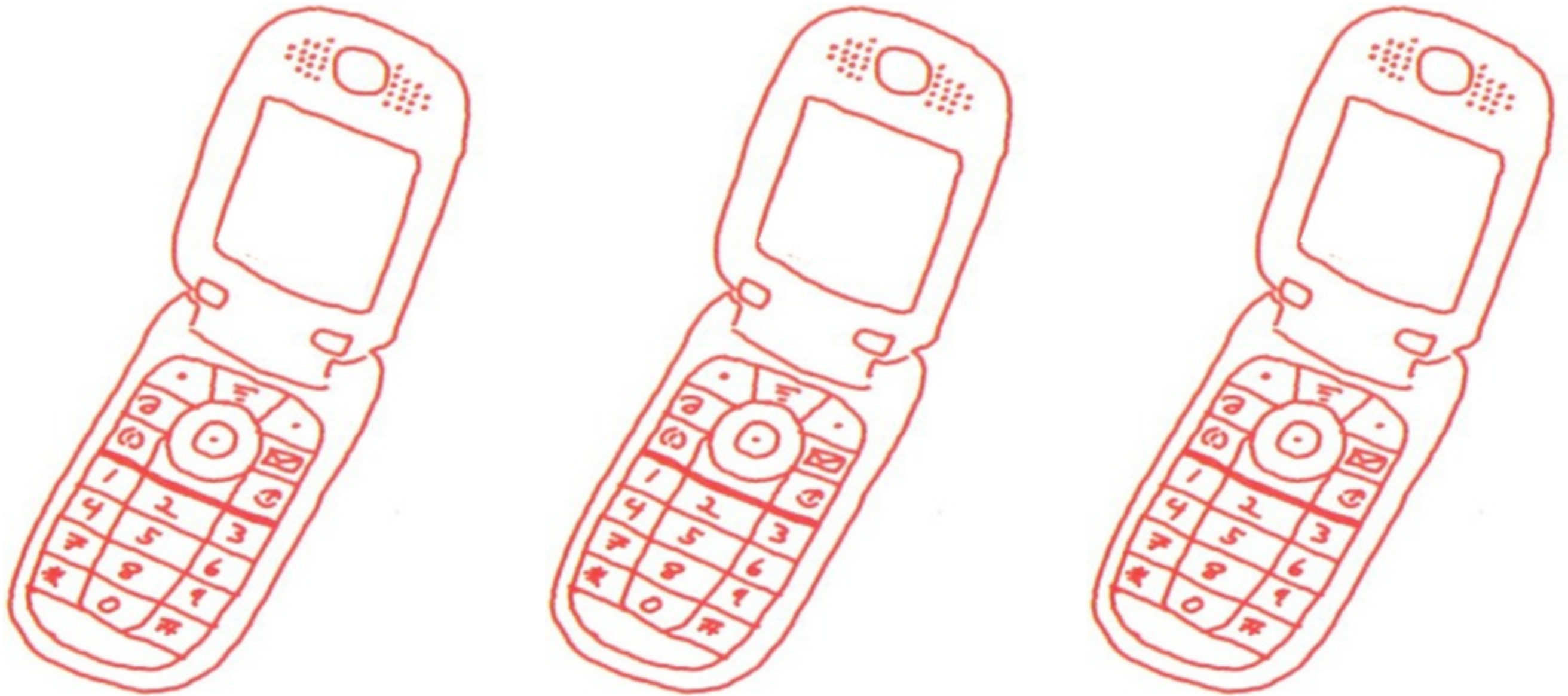
source: [1]



source: [1]

Generate blanks for your designs

- Screen can be filled in, phone is constant



source: [1]

Technique: Hybrid Sketches

source: [1]



source: [1]

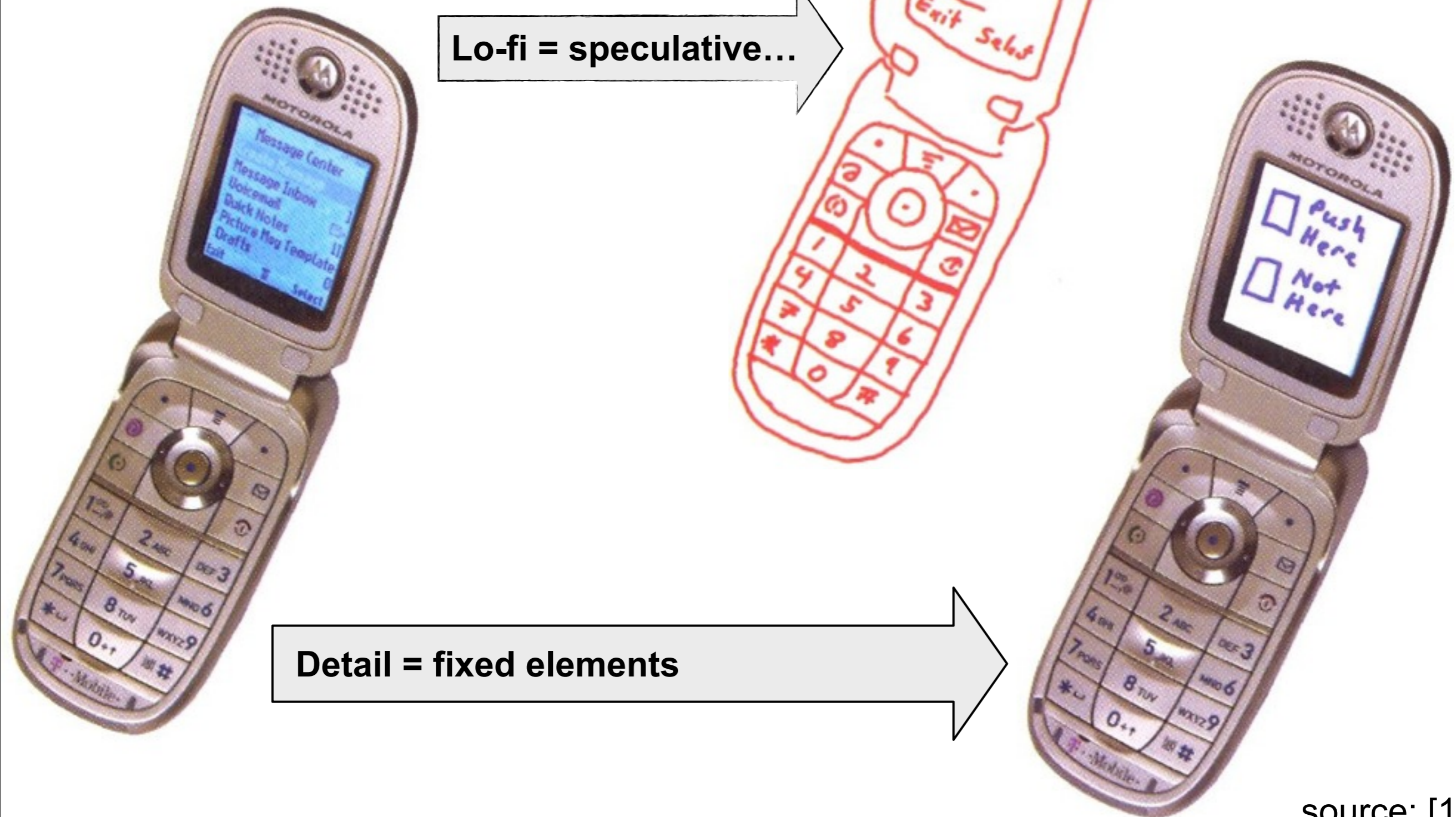
Technique: Hybrid Sketches

- **Mixes full and low fidelity elements**
- **High fidelity parts:**
 - fixed design elements
- **Low fidelity parts:**
 - speculative components
- **Contrast**
 - makes certain parts of sketch stand out over others



source: [1]

Hybrid Sketches



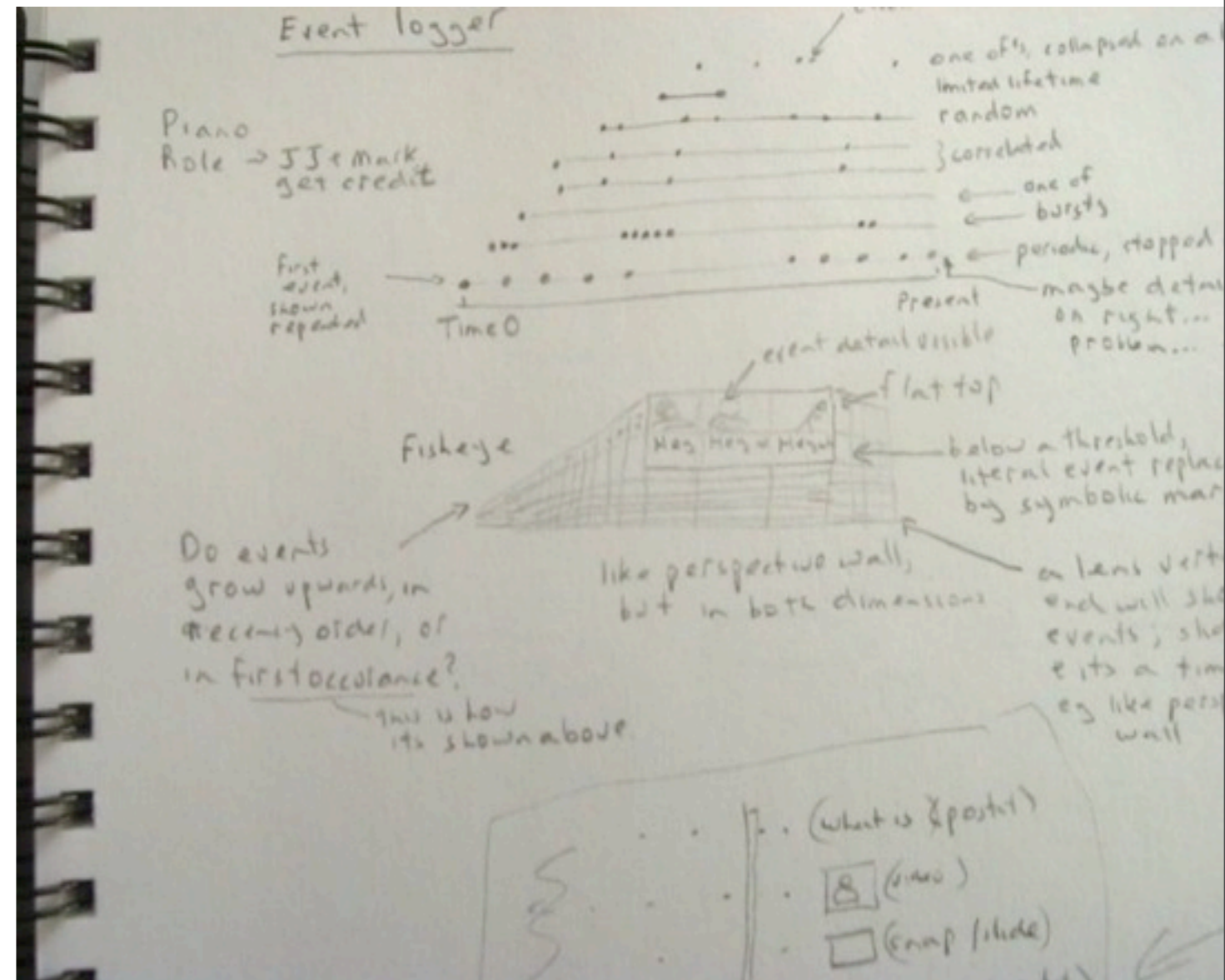
source: [1]

Technique: Annotations

source: [6]

Technique: Annotations

- **Augment a sketch**
 - directly on sketch
 - as layer
 - tracing
 - Photoshop layer
 - over dynamic media



source: [6]

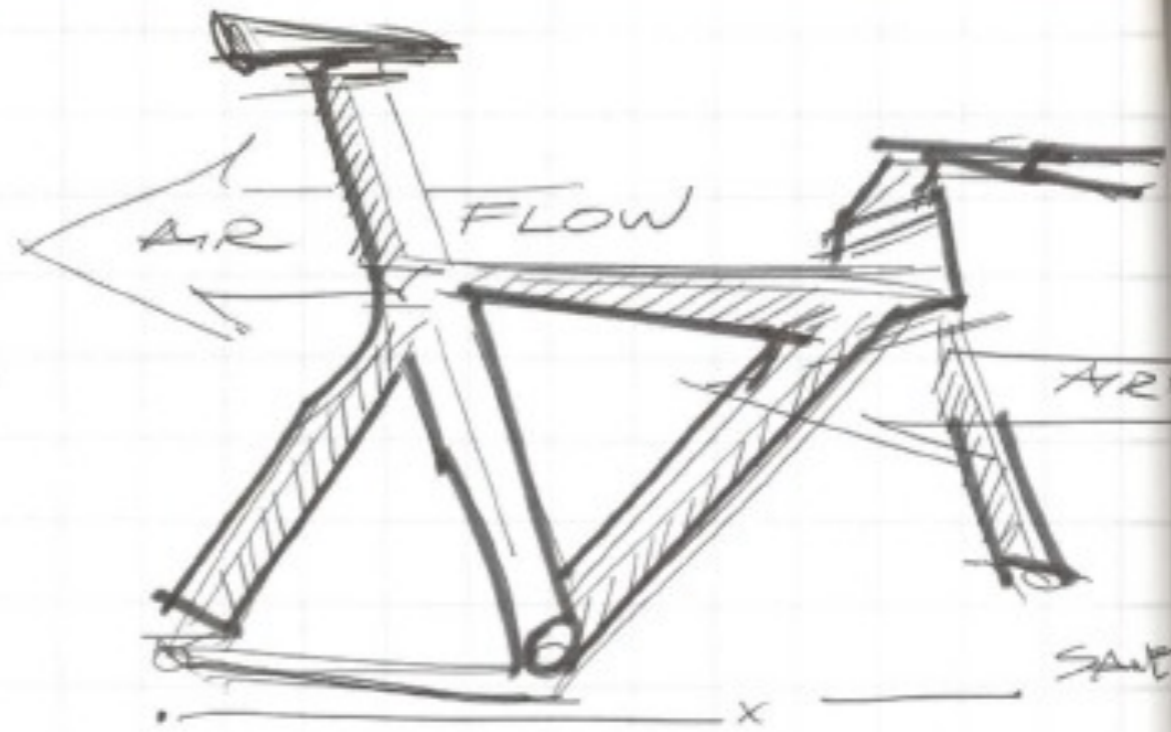
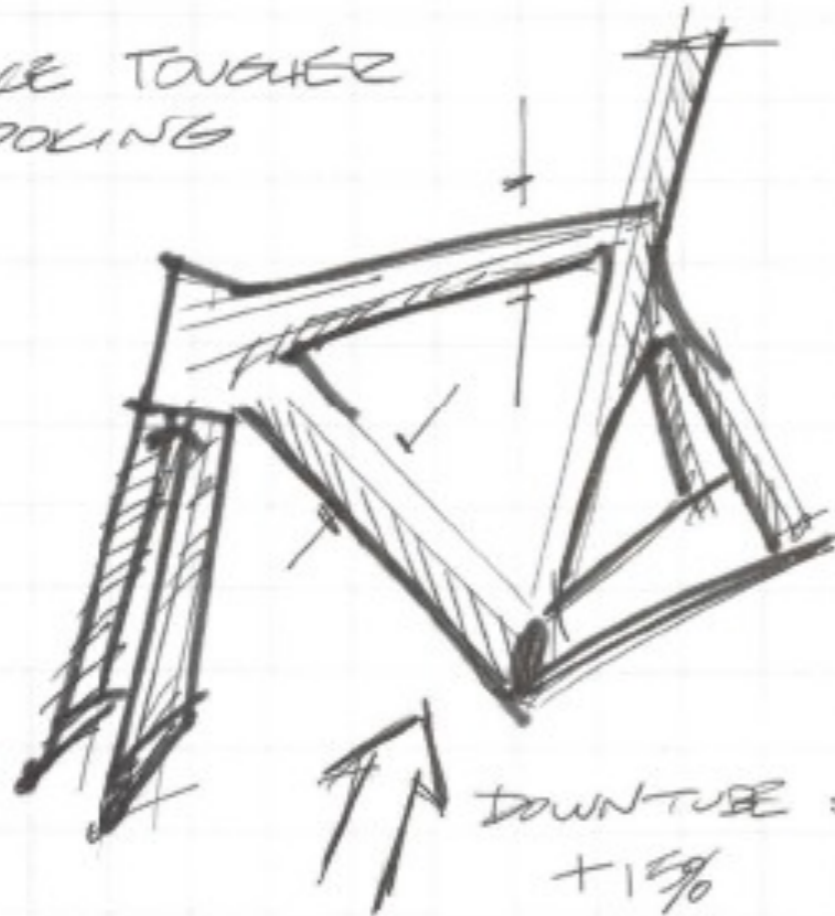
Technique: Annotations

- **Textual notes**
 - name and / or explain things
 - add detail
 - lists of items
 - questions / issues about design...
- **Graphical marks**
 - connects notes to sketch elements
 - relates sketch elements
 - show dynamics of elements or interaction over time...

FIX THUMBNAIL

REDUCE DRAG - 10%
INCREASE STIFFNESS

MAKE TOUCHER
LOOKING



CHANNEL AIR FLOW
- AT TOP TUBE
- ATTACH AT
SEAT STAY

Annotations

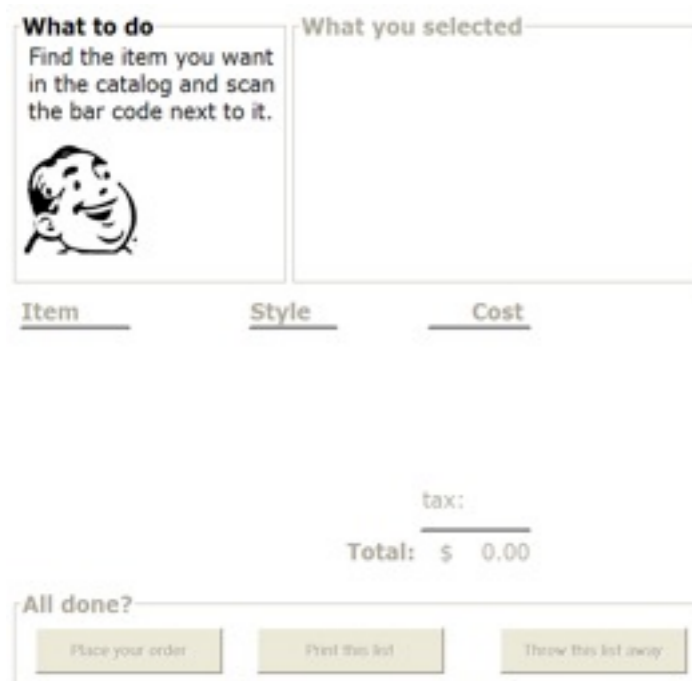
source: [1]

Sketching Interaction

- The Definition of Sketching
- Characteristics of Sketches and Sketching
- Sketches and Prototypes
- Is it a Sketch ?
- Sketching Techniques
- Storyboarding
- Visual Thinking and Video Sketching

Storyboarding

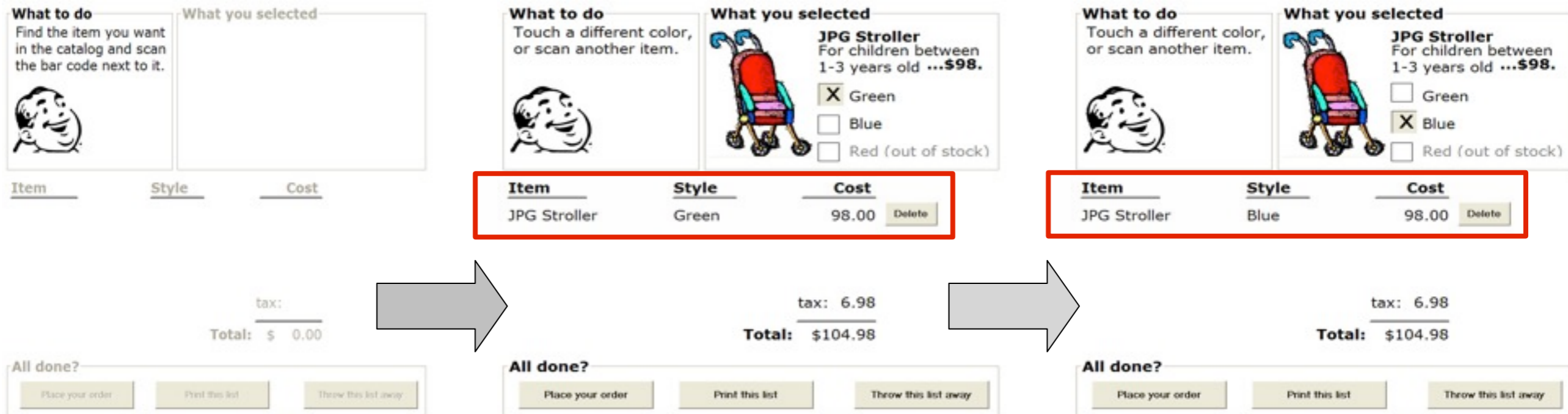
- Problem with **single sketches**
 - hard to capture dynamics of interaction over time
 - captures user interface, not user behavior
- A good sketch should **tell a story**



source: [1]

Storyboarding

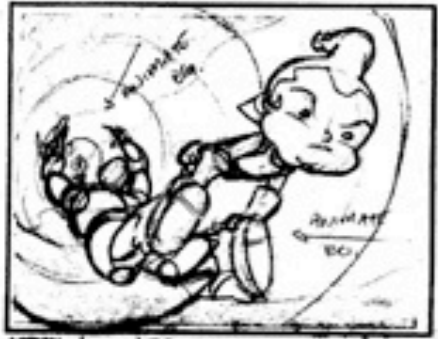
- Solution: use more than one image
 - a series of **key frames** as sketches
 - originally from film; used to get the idea of a scene
 - **snapshots of the interface** at particular points in the interaction
 - **portrays key scenes** in the interface and the transitions that caused the changes



source: [6]

Storyboarding in Animation

SC [] PNL 1



ACTION ANIMATE BG AS RUSTY FLIES. SYNTH-DWAYNE THROWS OUT TUBE FROM RET. DIAL

SC [] PNL 2



ON SYNTH-DWAYNE.

SC [] PNL 2



HE CAREENS HIS ARMS OUT. OUTTHROWING HIS TUBES TO THE TANKER'S DECK. <SPARKS> FLY.

SC [] PNL 1



ON RUSTY. PAUSE AS HE FLIES.

SC [] PNL 2



RUSTY IS JERKED BACK A BIT. HE LOOKS BACK IN SHOCK.

SC [] PNL 2



RUSTY IS PULLED BACK SLOWLY.

SC [] PNL 1



ACTION RUSTY PULLS AS SYNTH-DWAYNE TUBES TO STOP HIM WITH HIS HANDS. SPARKS ON THE EDGES OF THE TUBES. DIAL

SC [] PNL 2



RUSTY PUTS HERO DOWN. HE STRUGGLES. RUSTY - OH NO YOU DON'T!

SC [] PNL 1



PAUSE AS RUSTY GAINS INTO SC.

SC [] PNL 2



RUSTY CONTINUES AHEAD.

SC [] PNL 3



RUSTY FLIES O.S. SYNTH-DWAYNE'S FOOT PULLED INTO SC.

SC [] PNL 4



SYNTH-DWAYNE'S HANDS PULLED INTO SC.

SC [] PNL 5



ACTION SYNTH-DWAYNE'S HAND PULLED INTO SC. DIAL

SC [] PNL 6



S. DWAYNE'S HAND SLIPS AHEAD DOWNSIDE, SPARKING <SPARKS>

SC [] PNL 7



S. DWAYNE'S HAND O.S. SPARKS FOLLOW. D

SC [] PNL 1



STEP 4. BLADES WHIRLING. RAIN FALLS.

SC [] PNL 2



TRUCK IN AS THE SIG. OF DANGER WITH JOAN ON HIS SHOULDER APPEARS IN

note how each scene in this storyboard is annotated

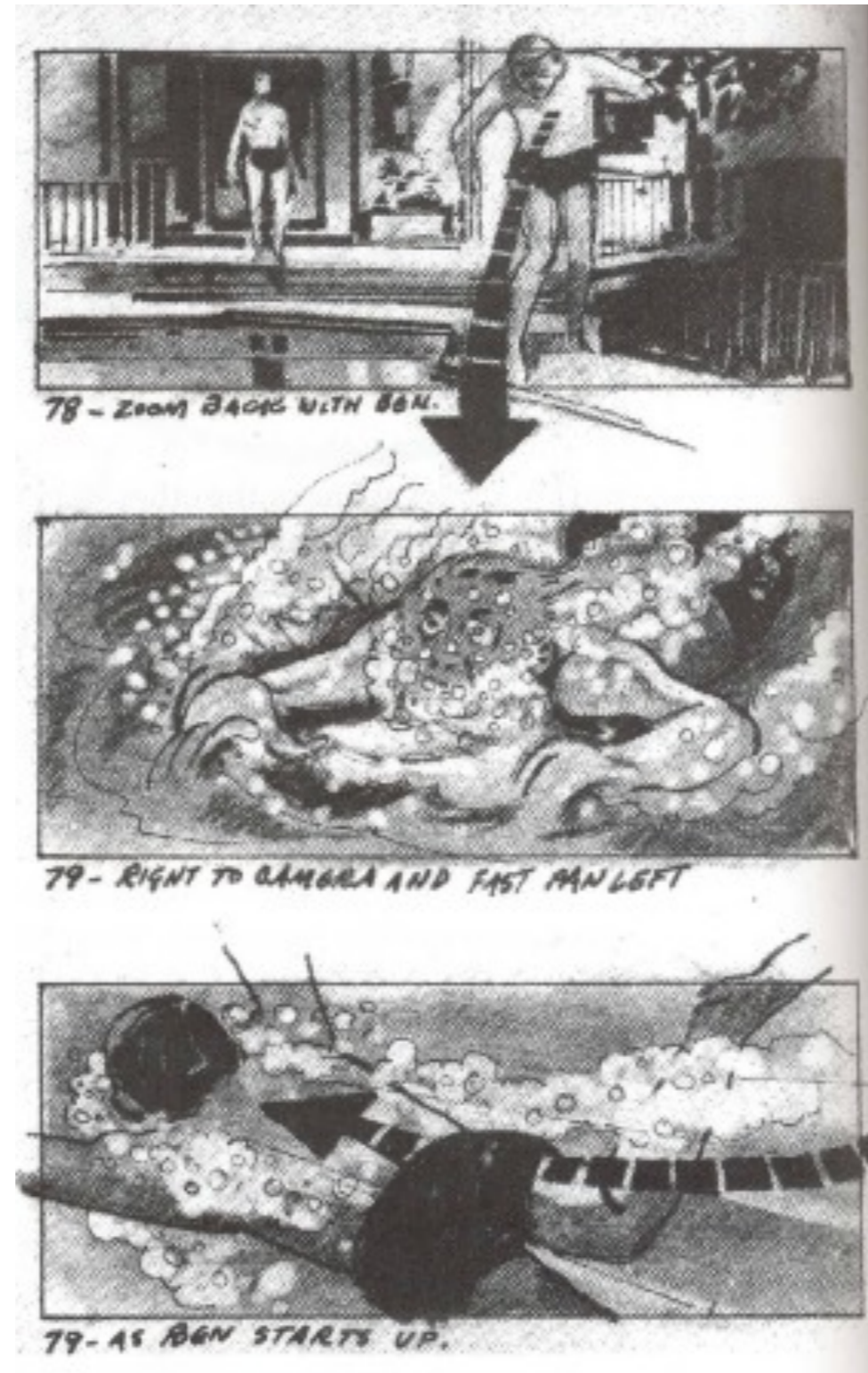
source: [6]

Storyboarding: Transitions are key



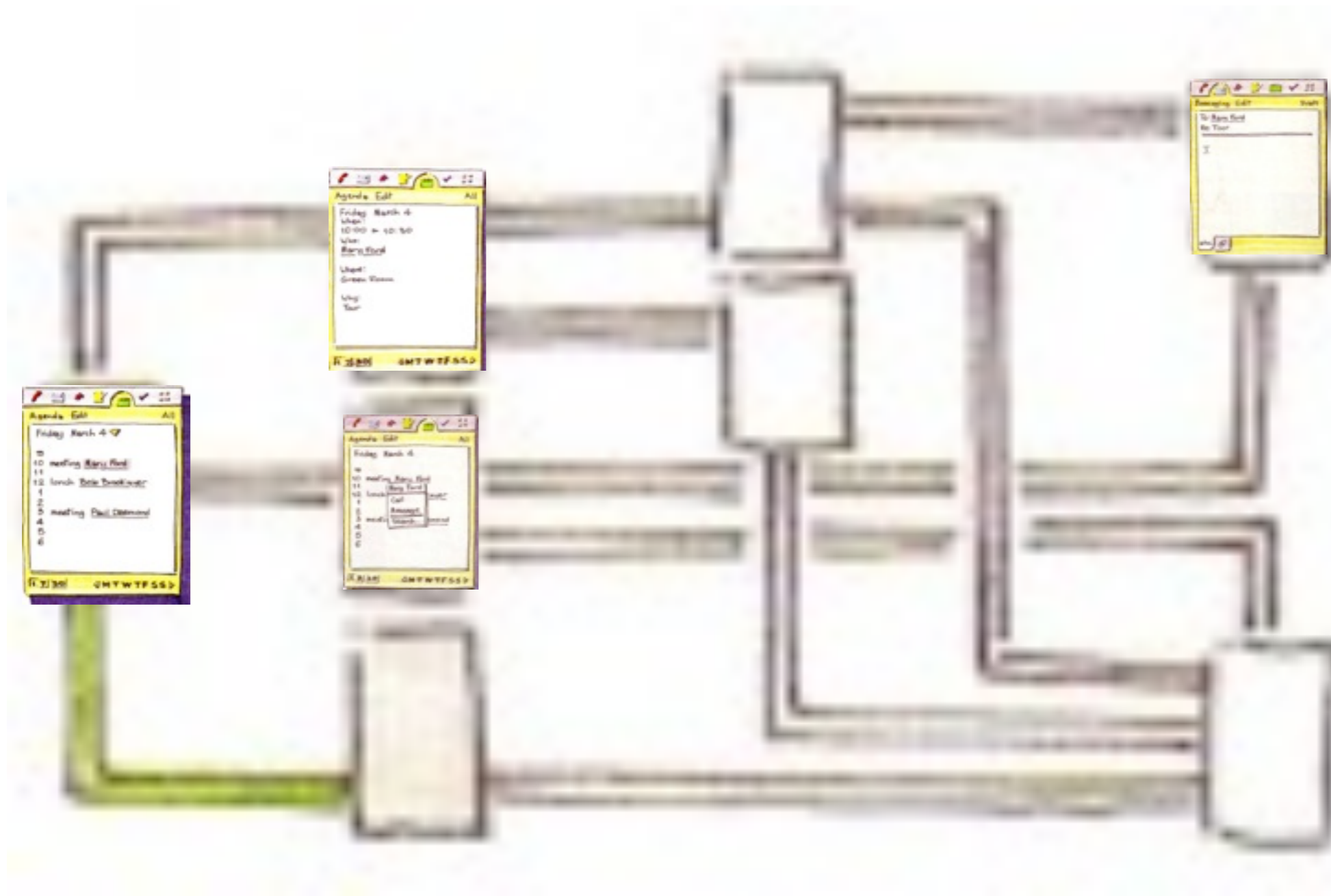
source: [1]

Storyboarding: Transitions are key



source: [1]

Technique: State Transition Diagrams

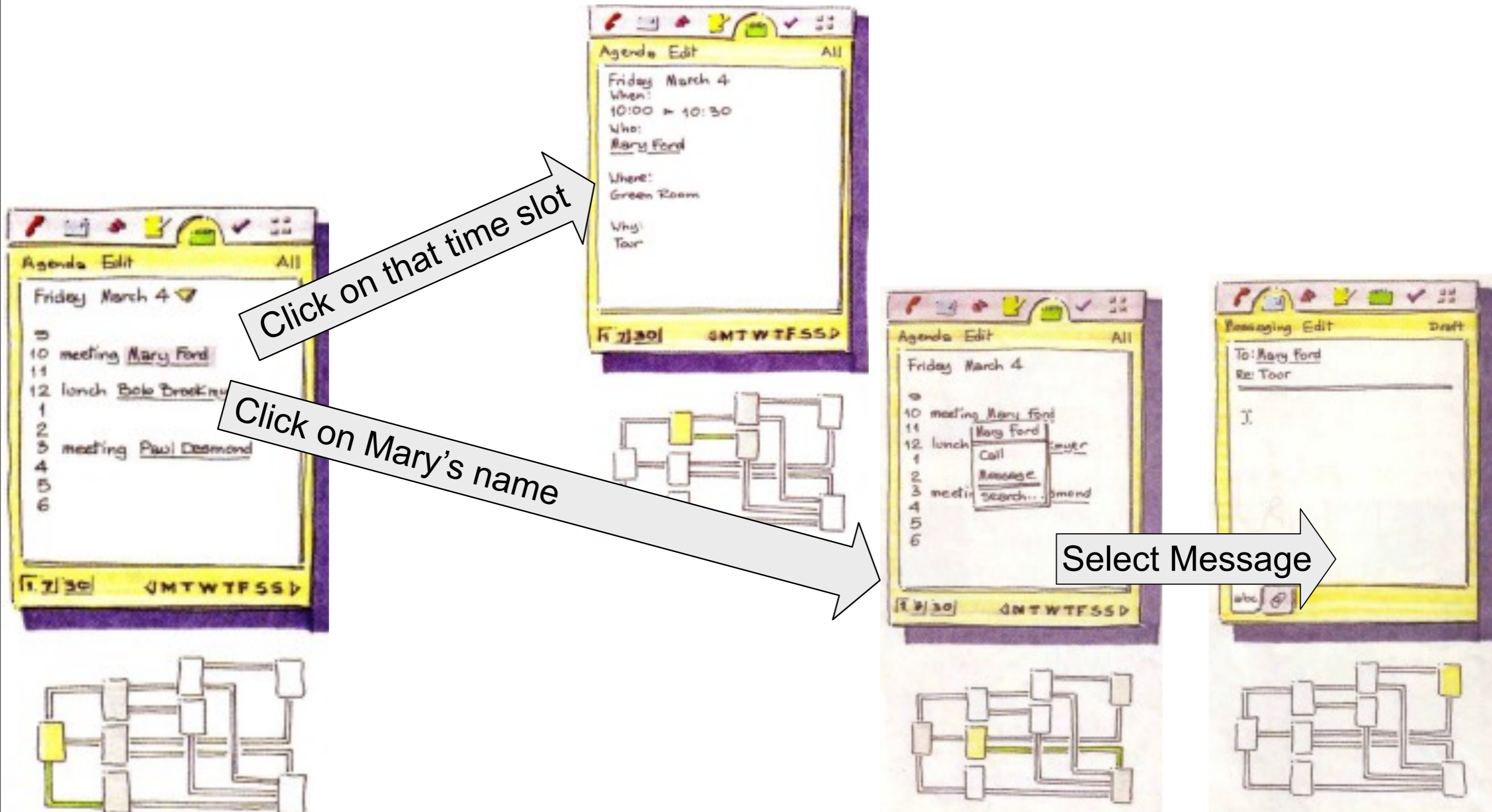


source: [1]

Technique: State Transition Diagrams

- **Create transition diagram**
 - key interaction steps
 - branch points
- **For each transition**
 - sketch the screen
 - include the transition diagram (a navigational map)
 - label the transition with what triggered the transition (typically user input or set of system responses)

Example: State Transition Diagrams



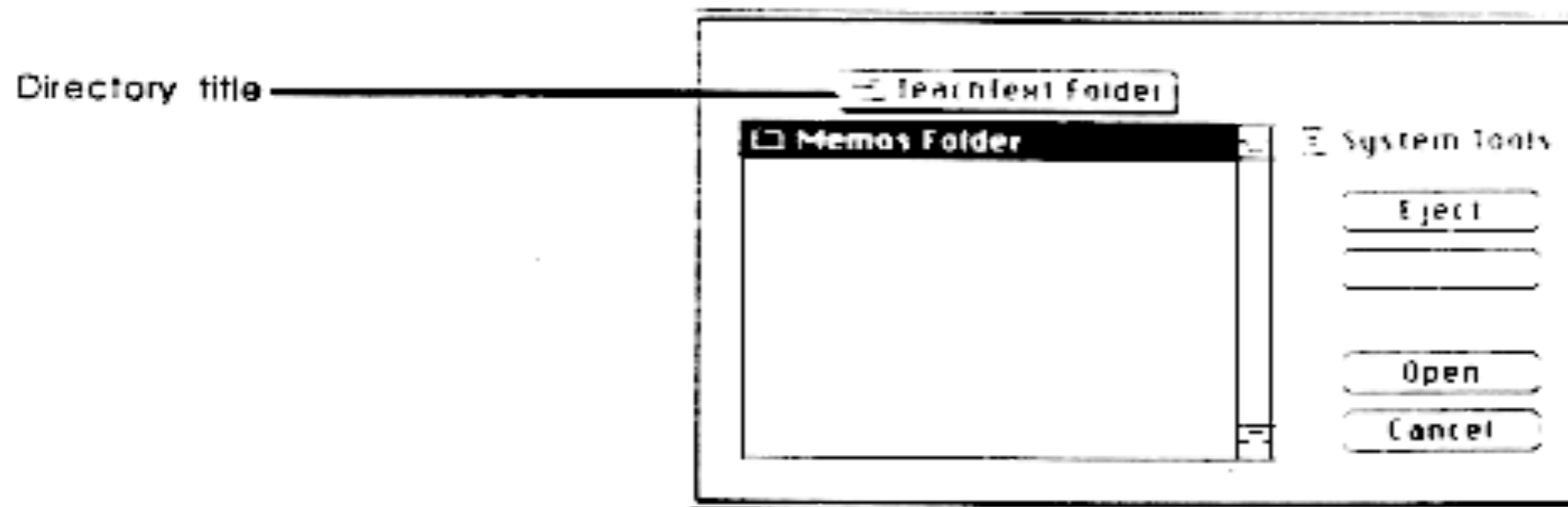
source: [1]



source: [1]

Technique: Tutorials as Storyboards

- a step by step storyboard walkthrough with detailed tutorial explanations







A directory title shows you the name of the folder you're presently working in—in this case, the TeachText Folder. The box beneath it shows you all the other items in the TeachText Folder that you can open with this application—in this case, only the Memos Folder.

Apple's Tutorial Guide to the
Macintosh Finder

source: [6]

Technique: Tutorials as Storyboards

- workflow of mail merging
- who's involved, responsibilities, etc.

Action	Illustration
<p>1. Margaret is an account manager for a marketing company. One of the accounts she oversees is for Great Groceries! which is a large foodstore chain. The Great Groceries! supermarket in Preauville has recently been extended and now includes a home appliance section. The supermarket manager wants everyone in Preauville to know that Great Groceries! is having a Grand Re-Opening Day, and that there will be lots of bargains. Margaret has created a colorful flyer to be sent out that contains all the details. She gives this to Susan, who is creating the address list.</p>	
<p>2. Susan is Margaret's secretary. She is helping Margaret to organize the Great Groceries! marketing campaign. Using Hey-Presto a software database containing names and addresses, Susan does a postcode search and compiles a list of all the street addresses in Preauville. She gives this list to Amy, who will do the mail merge.</p>	
<p>3. Amy is responsible solely for mail merging. She is expert at her job, but takes great care as the software is often unreliable. Because of the expense, the company frowns on wasting marketing materials due to mail merging errors. No matter how long the list, Amy generally runs her merged documents in small batches. This is time consuming, and fiddly, but Amy can put up with this inconvenience if in the end she gets an accurate result with few spoiled documents. She then gives the documents to Linda.</p>	
<p>4. Linda is responsible for quality control. She collects the mail merged documents from the printer and inspects a certain percentage of them for quality and accuracy. She then prepares the documents/flyers for feeding into a computer-controlled machine that folds them and inserts them into windowed envelopes. Finally, Linda collects them and has them sent to the mailroom at the appropriate point in the campaign.</p>	

source: [6]

Technique: Tutorials as Storyboards

- Storyboard for a website (for photographers)
- Sequence of pages (based on clicks)
- Explanations / annotations

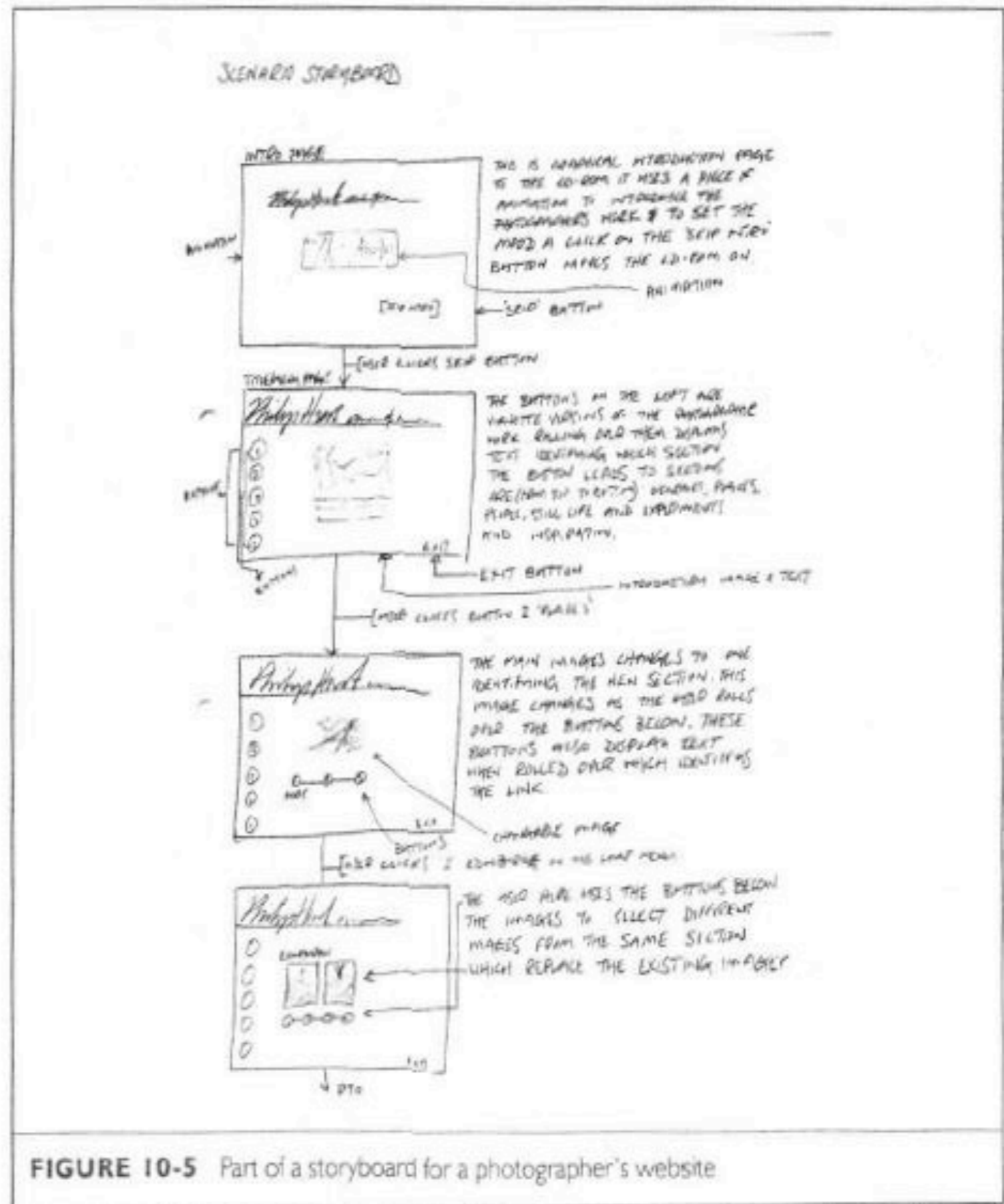
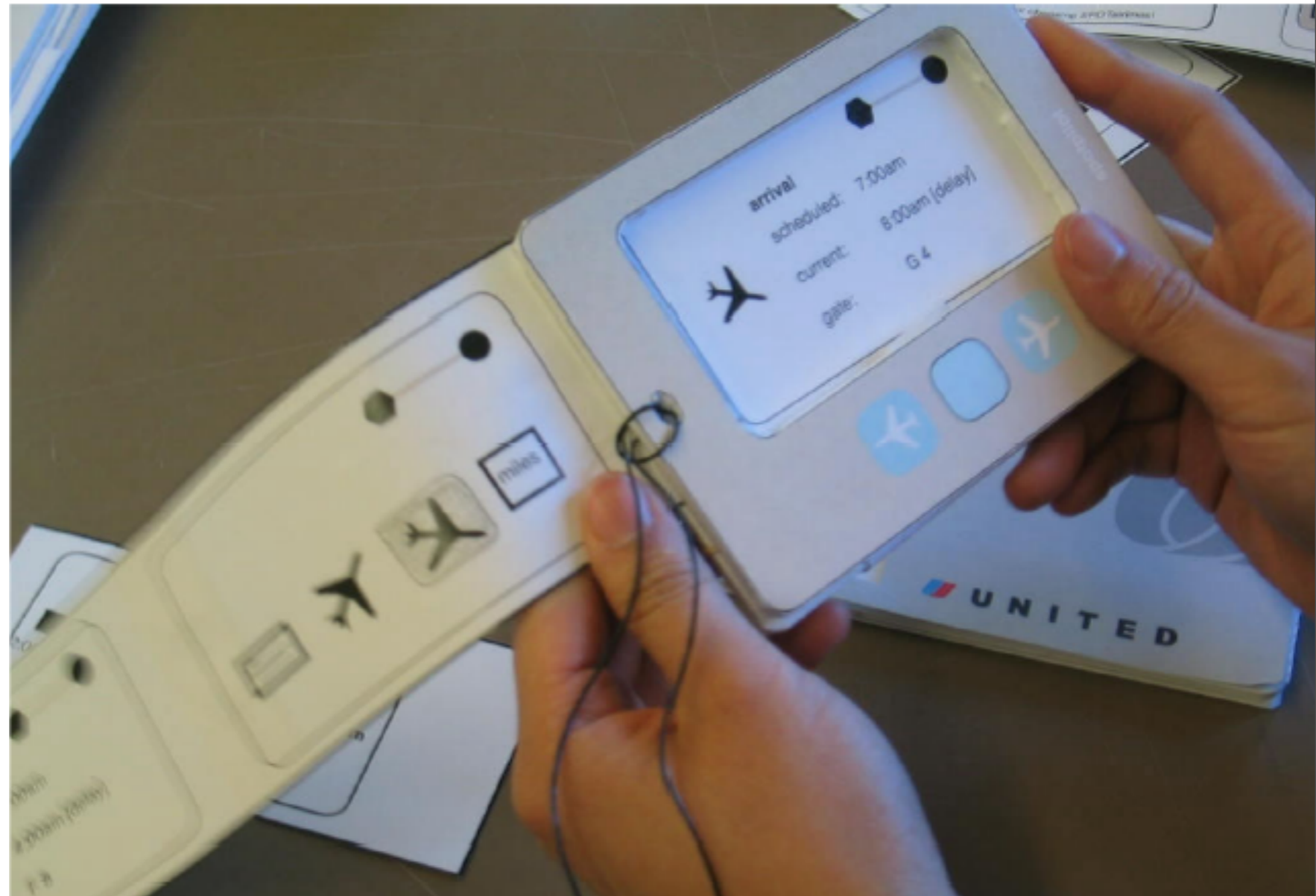


FIGURE 10-5 Part of a storyboard for a photographer's website

source: [2]

Technique: Make storyboards come alive

- **Spotlight:** an interactive foam core and paper sketch/storyboard

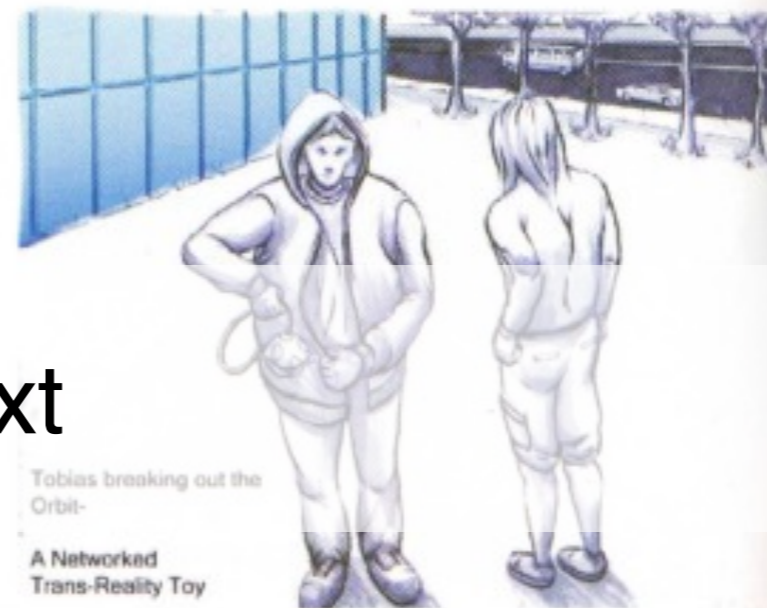


source: [6]

Technique: Capture interaction spirit

- Show the **mood and context** of use
(interaction details only a sub-story)

source: [1]



Storyboarding: Mood & Context

source: [1]

Sketching Interaction

- The Definition of Sketching
- Characteristics of Sketches and Sketching
- Sketches and Prototypes
- Is it a Sketch ?
- Sketching Techniques
- Storyboarding
- Visual Thinking and Video Sketching

Sketching Example

The process of **visual thinking and planning** allows a group of people to brainstorm together, placing their ideas on storyboards and then arranging the storyboards on the wall.

This fosters more ideas and generates **consensus inside the group**.

References:

- [1] Buxton, W. Sketching User Experiences, *Morgan Kaufmann 2007.*
- [2] Benyon, D. Designing Interactive Systems: A comprehensive Guide to HCI and interaction design *Addison Wesley 2010.*
- [3] Copenhagen Institute of Interaction Design, *Consultancy Project 2008.*
- [4] Copenhagen Institute of Interaction Design, *User Research Workshop 2008.*
- [5] Snyder, C. Paper Prototyping, *Morgan Kaufmann 2003.*
- [6] Stevens, G. UX Lecture Series *University of Siegen 2010.*