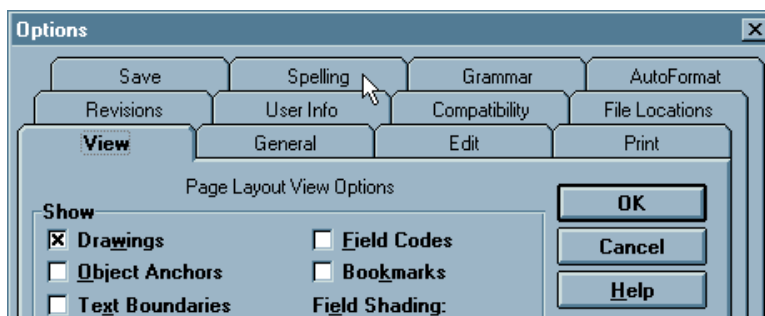
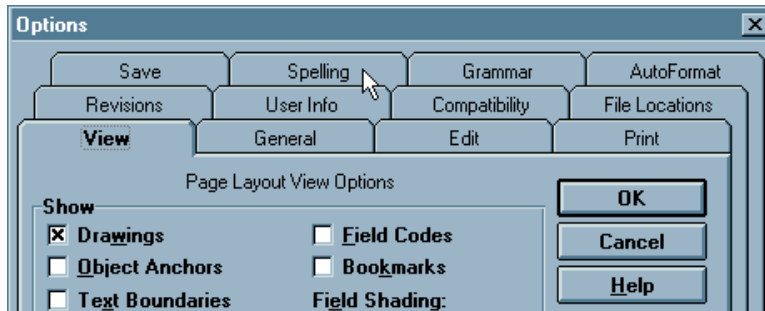


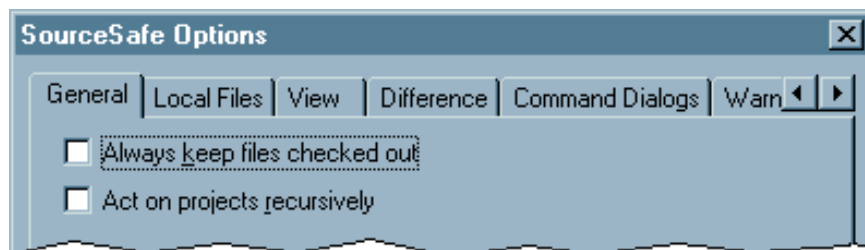
Sketching and Storyboarding

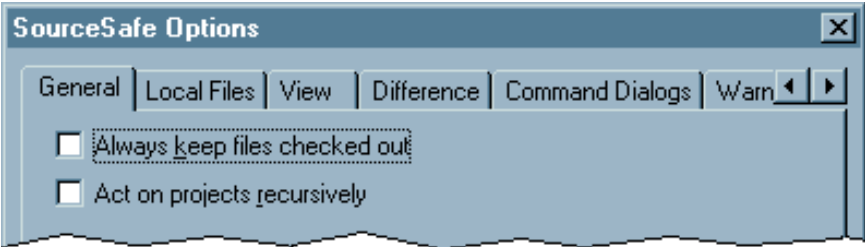
CSI 60: User Interfaces
Maneesh Agrawala and Jeffrey Nichols





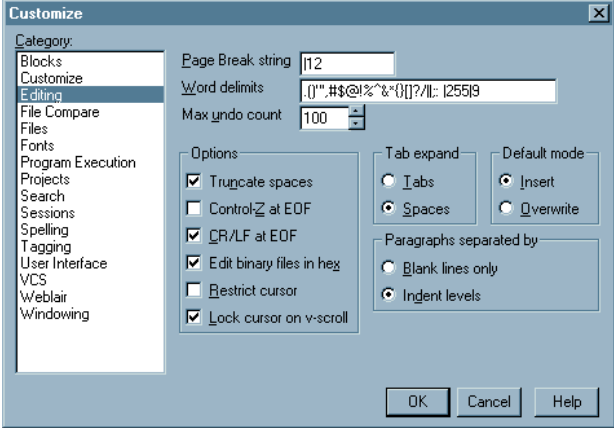
- Too many tabs – take up lots of screen space
- Tab layout reorganized every time user clicks on one
- Unclear if OK corresponds to single tab or to whole dialog



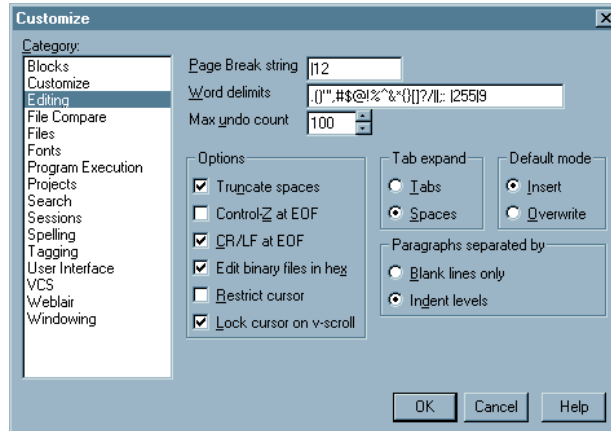


The screenshot shows the 'SourceSafe Options' dialog box with the 'Warn' tab selected. The dialog has a title bar with a close button. Below the title bar is a tabbed interface with tabs for 'General', 'Local Files', 'View', 'Difference', 'Command Dialogs', and 'Warn'. The 'Warn' tab is active and contains two unchecked checkboxes: 'Always keep files checked out' and 'Act on projects recursively'.

- Many tabs are hidden
- Have to scroll through to see all tabs



The screenshot shows the 'Customize' dialog box with the 'Editing' category selected in the left-hand list. The dialog is divided into several sections: 'Page Break string' (112), 'Word delimits' (.()\"#\$%&!%`&*(|[]?/!/: |255|9), and 'Max undo count' (100). There are three main sections of options: 'Options' with checkboxes for 'Truncate spaces', 'Control-Z at EOF', 'CR/LF at EOF', 'Edit binary files in hex', 'Restrict cursor', and 'Lock cursor on v-scroll'; 'Tab expand' with radio buttons for 'Tabs', 'Spaces', and 'Default mode' with radio buttons for 'Insert' and 'Overwrite'; and 'Paragraphs separated by' with radio buttons for 'Blank lines only' and 'Indent levels'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.



- Can fit in many more options vertically
- Layout never changes (selecting one does not affect others)

Review: Structure & Design

Formal Elements

- Players
- Objectives
- Procedures
- Rules
- Resources
- Conflict
- Boundaries
- Outcome

Engaging Elements

- Challenge
- Play
- Premise
- Character
- Story

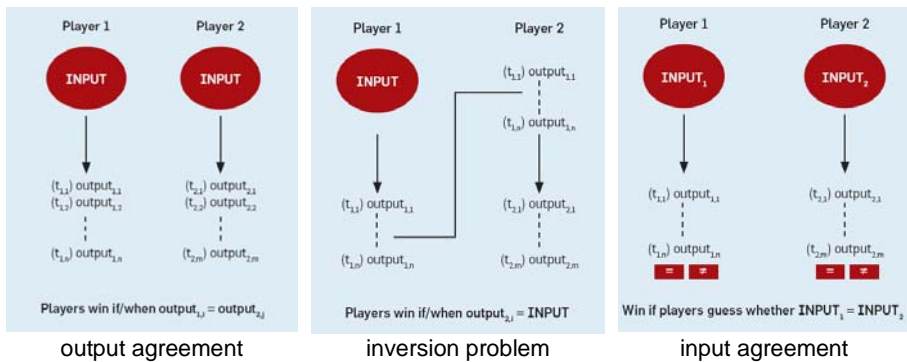
What is the difference between procedures and rules?

Review: Games Benefiting Players



How else could games benefit players?

Review: Games Solving Problems



What are examples in each category?
 Think of a new game design in each category

Due Today (before class)

Individual Project Proposal

Project Groups (email by EOD)

Groups of 4

- You can choose your group
- Need to decide today
- Send email by end of day - today

Send email to cs160@imail.eecs.berkeley.edu

- One email per group
- List other group members
- If your group is 1, 2 or 3 people we will build groups for you

Each person must appear in some email by the end of the day or we will assign you ourselves

Project Assignment (due Feb 9)

Group Brainstorm

- Goal: Brainstorm and refine project ideas with small group
- Will have time in class (next time)
 - You may also need to meet outside class to finish the assignment

Next class (meet in Wozniak Lounge)

- Bring printouts of your Individual Project Proposal
- Brainstorm together

Design Assignment (due Feb 9)

Design Photocopier Touchscreen: 10 pts

- 5"x3" window
- Functions
 - Start/Stop Copying
 - Quantity of copies to make (0-100)
 - Light/Dark setting (7 levels)
 - Multiple paper sizes for input and output (Letter, Legal, Tabloid)
 - Automatic scaling when copying between different page sizes (on/off)
 - Manual scaling (25%-400%)
 - 2-sided copying (1->1, 1->2, 2->1, 2->2)
 - Image repeat
- Produce at least 3 sketches showing alternate designs
 - Describe advantages/disadvantages of each
 - Should be hand-drawn - Scale them to be easy to read in wiki
- Due before class on Mon online, bring printout to Section

Sections

How can we reduce to 2 sections?

W 1-2pm

W 2-3pm

Th 1-2pm

Topics

- Affordances
- Depicting Processes
- Storyboarding
- Sketching (Lora Oehlberg)

Affordances

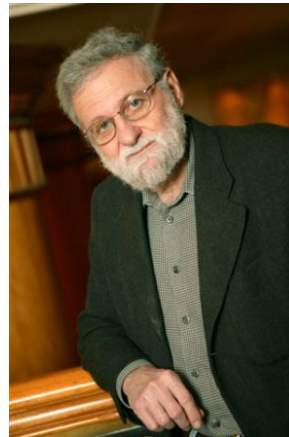
“... the term **affordance** refers to the *perceived* and *actual* properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used.

Some affordances obvious

- Knobs afford turning
- Buttons afford pushing
- Glass can be seen through

Some affordances learned

- Glass breaks easily
- Floppy disk
 - Rectangular – can't insert sideways
 - Tabs prevent backwards insertion



The Design of Everyday Things. 1988. Don Norman

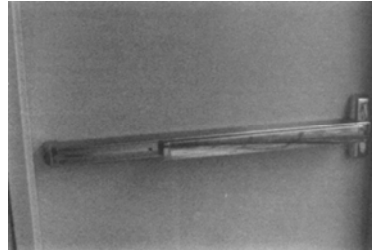
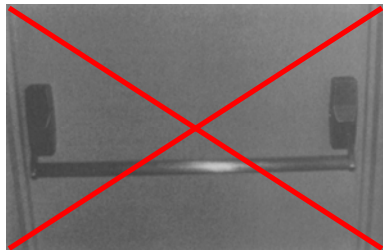
Door Handles

Affordances suggest how to use the object



Door Handles

Affordances suggest how to use the object



Dependencies

Affordances suggest how to use the object

Can be dependent on the

- Experience
- Knowledge
- Culture



Cultural Dependencies

Affordances suggest how to use the object

Can be dependent on the

- Experience
- Knowledge
- Culture
 - Switches (US down=off, UK down=on)
 - red = danger, green = go

Can make an action easy/difficult



Perceived Affordances

Affordances suggest how to use the object

Can be dependent on the

- Experience
- Knowledge
- Culture of the actor

Can make an action easy/difficult

Affordances may be *perceived* without actually existing



Screen-Based Interfaces

Physical affordances

- Screen, pointing device, physical buttons, keyboard
- These afford touching, pointing, clicking on every pixel



Screen-Based Interfaces

Physical affordances

- Screen, pointing device, physical buttons, keyboard
- These afford touching, pointing, clicking on every pixel

Physical affordances of screens often unused

- Screen affords touching, but most screens are *not* touch sensitive



Game Controller Affordances



Game Controller Affordances

Wii remote, roughly flashlight sized,
easy to grip the right way.

Roughly the diameter of a tennis racket/
baseball bat/golf club

“Trigger” button underneath falls
under the index finger.

Most-used buttons are thumb-
or index-finger operated.



Game Controller Affordances

But the Wii remote also supports two-handed use.

In this position, the main select “A” button falls under the left
hand. The right hand button replaces it.

Main select doesn't work in older Nintendo games. This takes
some getting used to...

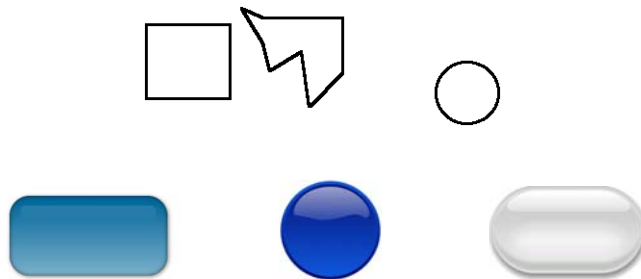


Designer Controls Perceived Affordances



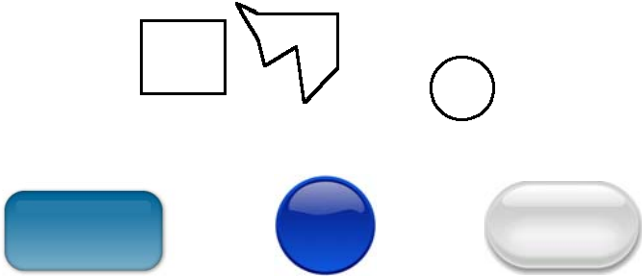
What are the affordances of these graphical objects?

Do Graphical Objects Afford Clicking?

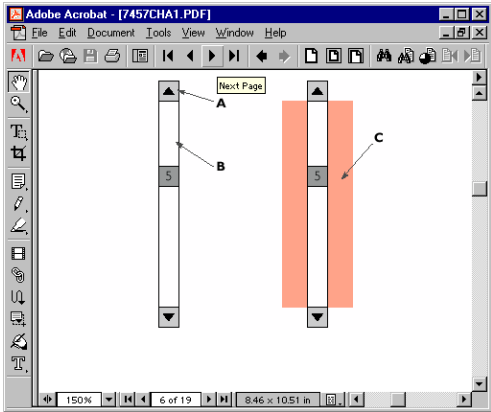


What are the affordances of these objects?

Do Graphical Objects Afford Clicking?



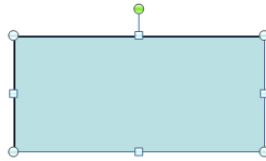
- Graphic design emphasizes affordances
- Does user recognize object as a button to be clicked?



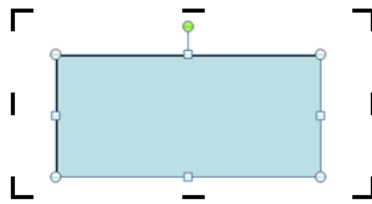
Widget Affordances

Well-designed widgets have clear affordances

e.g. resize handles:



crop handles:

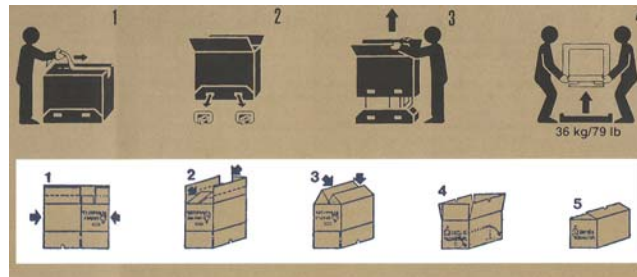


motion arrows

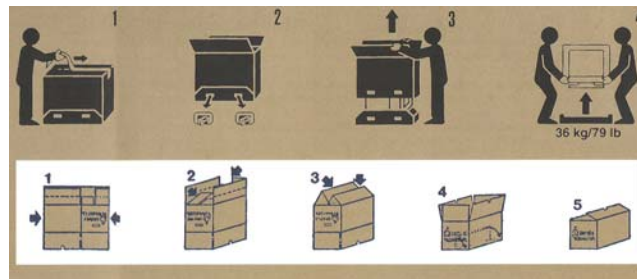


Depicting Processes

What is a Process?



What is a Process?



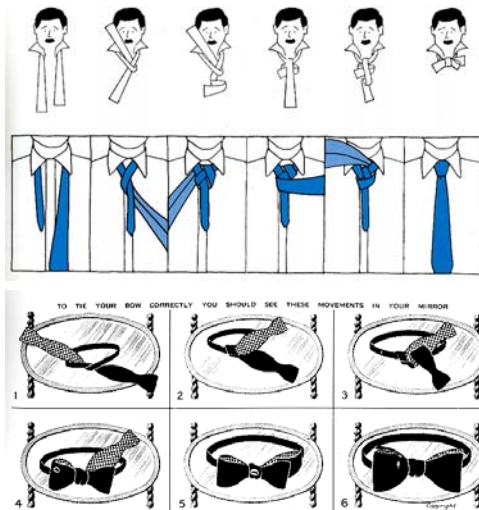
Process: A series of actions or operations conducting to an end

- Series → Time
- End → Goal

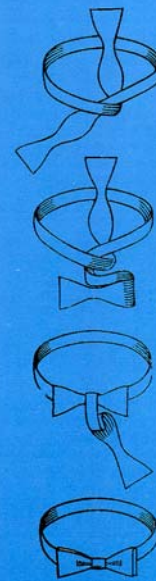
Lego Assembly Instructions



Putting on a tie



Instructions to Tie



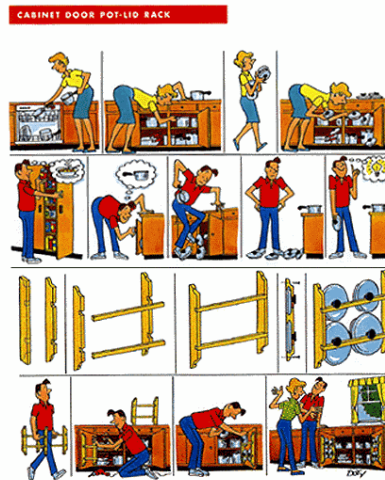
Creating the Narrative

Process: A series of actions or operations conducting to an end

1. Choose the goal
2. Plan ordered set of actions to achieve goal
3. Depict each action

Breaking Goal Into Tasks/Actions

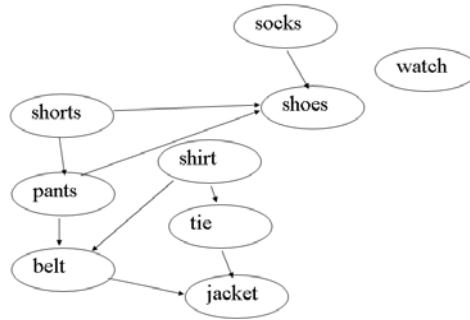
- What is unit of action?
- Sub-steps within steps



Wordless Workshop [Doty 96]

Planning

- Which actions?
- What order?



Operations required to dress
[based on Cormen et al. 90]

Depiction

Visual instructions for learning disabled

<p>Peanut butter & Jelly Sandwich</p>	<p>Get 2 slices of bread.</p>	<p>Open peanut butter.</p>
<p>Spread peanut butter.</p>	<p>Put lid back on.</p>	<p>Open jelly.</p>
<p>Spread jelly on bread.</p>	<p>Put lid back on jelly.</p>	<p>Put together</p>

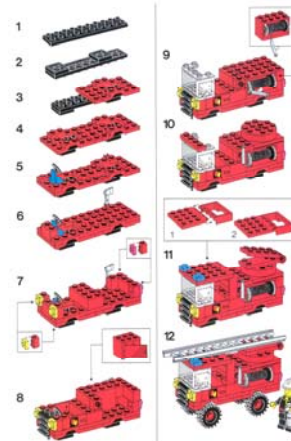
[Orth 01]

Depiction

- Words \longleftrightarrow Images

Building a Lego Fire Truck

1. Start with 2 x 20 black piece
2. Turn over and attach 2 x 2 black piece flush with left side. Attach another 2 x 2 black piece 2 studs in from the right side.
3. Turn right side up and attach 1 x 4 red piece ...



[from Mijksenaar 99]

Words and Images

Words

- Labeling / Annotation
- Verbs (actions)
- Adverbs, Some adjectives
- Abstract concepts

Images (Very important for interface design)

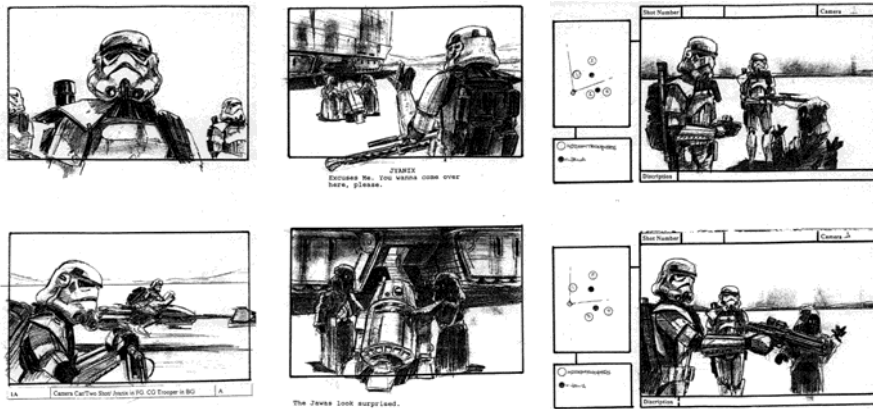
- Visual / physical properties
- Spatial relationships
- Actions indicated by diagrammatic conventions

- Images allow for graphic conversations ([QC514A.mov](#))
- Loose diagrams are especially useful early on ([QC515A.mov](#))

Storyboarding

In Interface Design

Troops



See <http://www.theforce.net/theater/shortfilms/troops/>

Storyboarding for Interfaces

Technique

- Series of frames depicting key steps in reaching a goal
 - Can use a pin board for easy rearrangement/editing
- **Describe the interaction in context**
 - Often useful to **show user** in at least 1st frame (establishing shot)
 - Relationship between the user and its environment
 - Relationship between the user and the system

Sketch: Single Display



Sketch: Single Display

Movies

Theater: Shattuck Cinemas
 Phone: (510) 665-1342 Dist: 1.5 mi.
 Address: 2122 Shattuck Ave
 Berkeley, 94709
 Cost: \$8.50 normal, \$6.00 senior, \$4.50 matinee

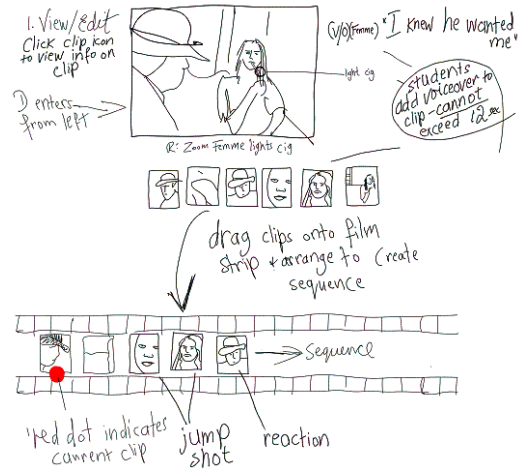
Map-It

Art of War	☆☆☆
(10:00)-(1:00)-4:00-7:00-10:00	
Bittersweet Motel	☆☆☆☆
(11:00)-(1:30)-4:00-6:30-9:00	
Godzilla	☆☆
(10:30)-(2:00)-5:30-9:00	
The Cell	☆☆☆☆
(11:00)-(1:00)-3:00-5:00-7:00-9:00	

Sketch: Single Display

<p>ACTIONS</p> <p>X REJECT</p> <p>✓ ACCEPT</p> <p>△ INSECT</p> <p>STEINER</p> <p>MOVE</p> <p>! ADD COMMENT</p> <p>I ITALIC</p> <p>B Bold</p> <p>A CAPITALIZE</p> <p>YANK WORDS</p> <p>YANK SENTENCE</p> <p>DELETE</p> <p>Zoomed</p>	<p>AUTHOR EDIT VIEW MODE</p> <p>How does technology help our education? Well, the items that are probably used the most that have to do with technology are computers. A computer allows students to go on the Internet, and look up research, and while we gather information, we have fun. Can you believe that? I can have fun while we learn. That's not what I expected when I started school. I thought technology would be tedious while I learned. Boy, was I wrong! To tell you the truth, I like school and I'm glad we have technology to help us. It makes learning a lot more fun!</p> <p>My example of technology is a computer. It helps my education.</p> <p>Another person who thinks the same words are important. She always has knowledge of books that do not have computers. She is always finding new assignments to give us. Some of them are easy and some of them are not.</p> <p>Another item that has to do with technology that helps our education is a digital camera. We use the digital camera to make books with pictures of our class. It is easy to use to take pictures with the digital camera, but sometimes it gets complicated. When it does, I ask Mr. Williams, our computer and camera whiz, to help me. Then after he assists me I have learned something new. So if you think about it, learn something that is good to know, and while I learn, I have fun. I am glad we have technology so we are able to have computers and digital cameras to help our education.</p> <p>Technology is a big part of my education. If we didn't have technology, it would take ten times as long to look up information about a subject than with</p> <p>LINKS HELP SEARCH DONE REVIEWS</p>
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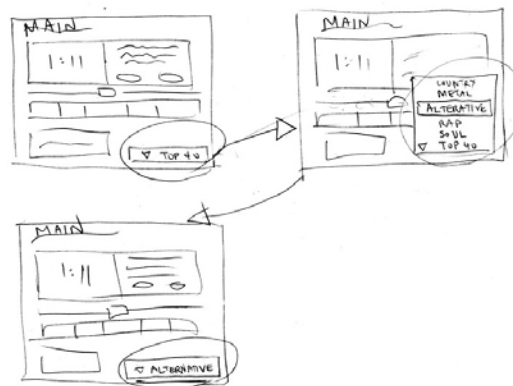
Sketch: Single Display



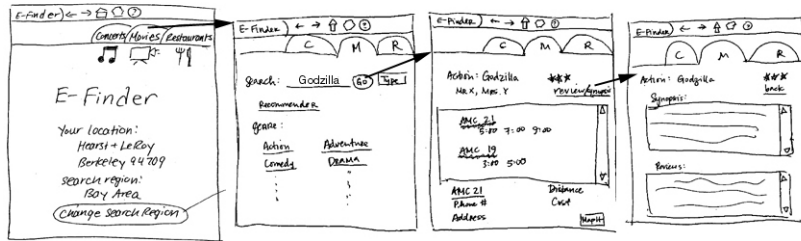
Film Editing Interface

Storyboards: Multiple Frames

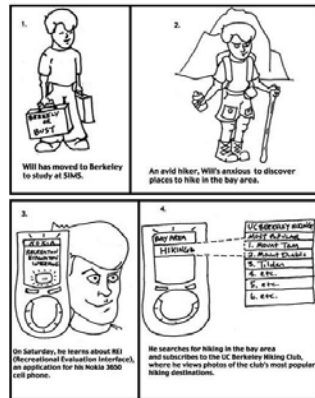
SCENARIO 1 "I want to listen to alternative music"



Storyboards: Multiple Frames



Storyboards



1. Will has moved to Berkeley to study at SIMS.

2. An avid hiker, Will wishes to discover places to hike in the bay area.

3. On Saturday, he learns about #1 (Recreational Evaluation Institute), an application for his Nokia 3600 cell phone.

4. He searches for hiking in the bay area and subscribes to the UC Berkeley Hiking Club, where he views photos of the club's most popular hiking destinations.



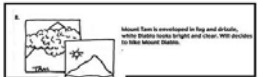
5. Will browses through recently posted pictures of each location.



6. Based on the photos he's viewed, he decides to go hiking tomorrow at either Mount Tehachas or Mount Diablo.



7. On Sunday morning, Will runs 101 again and views photos taken early that morning at Mount Diablo and Tahoe.



8. Mount Teah is enveloped in fog and drizzle, when Steve runs bright and clear. Will decides to hike Mount Diablo.



9. Later that day, at the summit of Diablo, Will uploads photos of the area to his UC Berkeley Hiking Club #1 app.



10. On Monday, back in Berkeley, Will also uploads his own photos so that he can share his photos with his family.

11. With another click, Will receives an invitation to join the UC Berkeley Hiking Club #1 app. She subscribes and is able to instantly see photos that Will takes.

From SIMS 202

Test Storyboards with Users

Can be “played” in front of users (or other designers)

Check understanding of process users go through

- Observe user reaction
- Debrief users

Good reference point during the design process

Next Time

In Class Group Brainstorm

Bring another printout of your Individual Project Proposal

Reading

[Direct Manipulation Interfaces](#). *User Centered System Design*.
Chap 5. Hutchins, Hollan & Norman.

This is a classic HCI paper, but quite dense. Focus on understanding Fig 6.

