

# Sketching and Storyboarding

CSI 60: User Interfaces  
Maneesh Agrawala

## Error Messages



## **Error Dialog Boxes**

Why are they problematic?

How related to locus of attention?

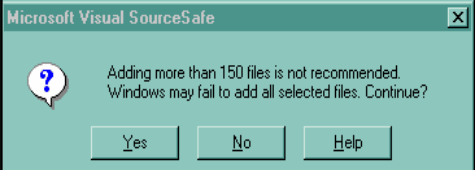
## **Error Dialog Boxes**

Why are they problematic?


How related to locus of attention?

What are the alternatives?

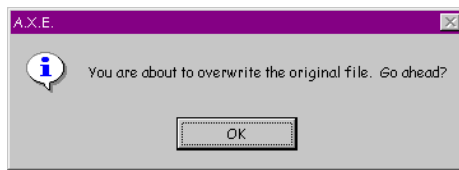
- Make errors as impossible as possible
  - Pull down of state codes rather than typing in codes ...
  - Handle all possible types of input



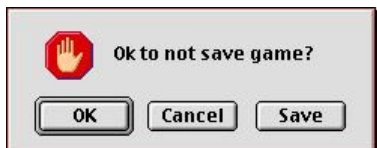
**Umm, thanks for the warning, but what should I do?**



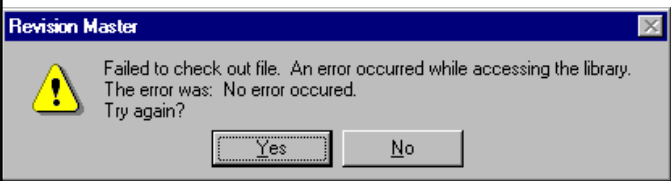
**What happens when you cancel a cancelled operation?**



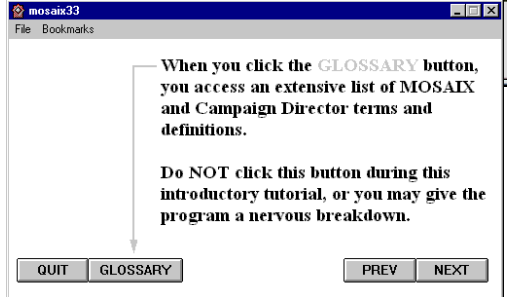
**Do I have any choice in this?**



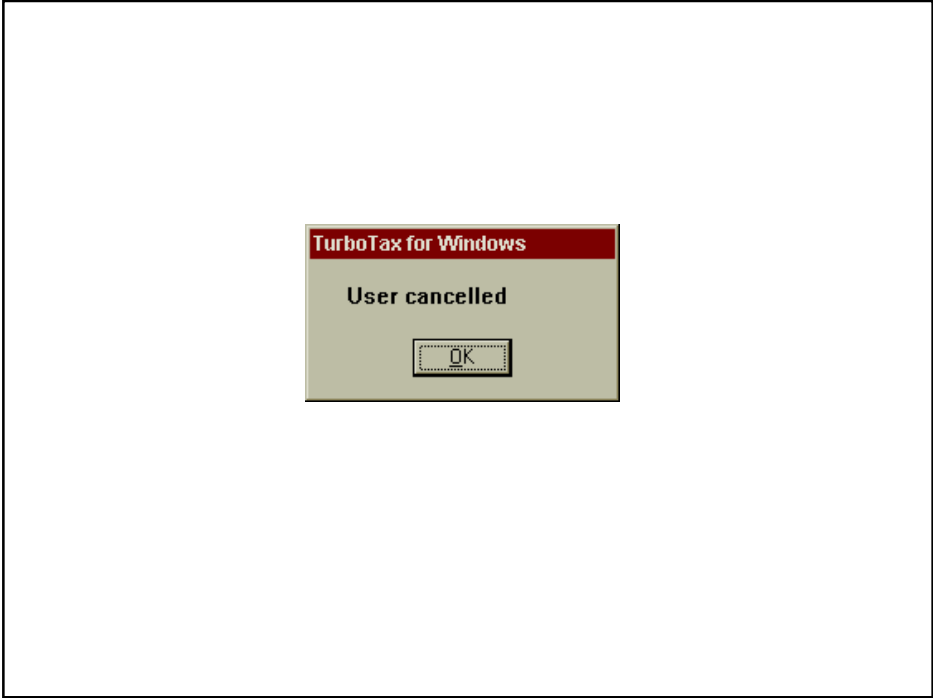
**Uhhh... I give up on this one**



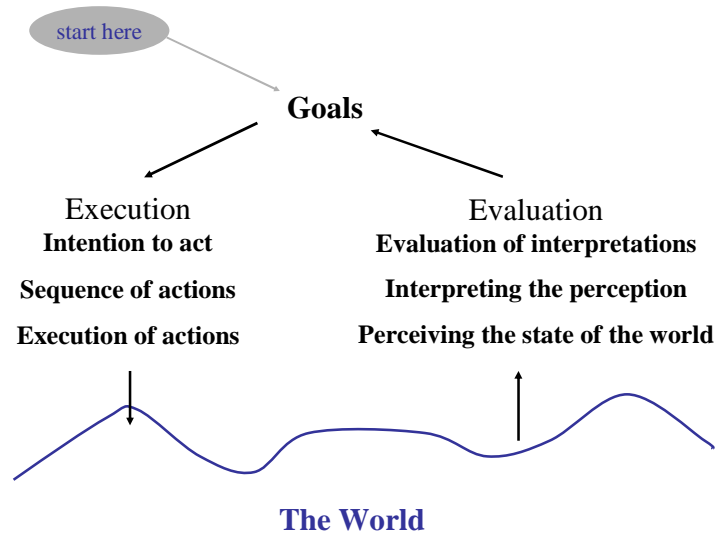
**Inane Dialog Boxes**



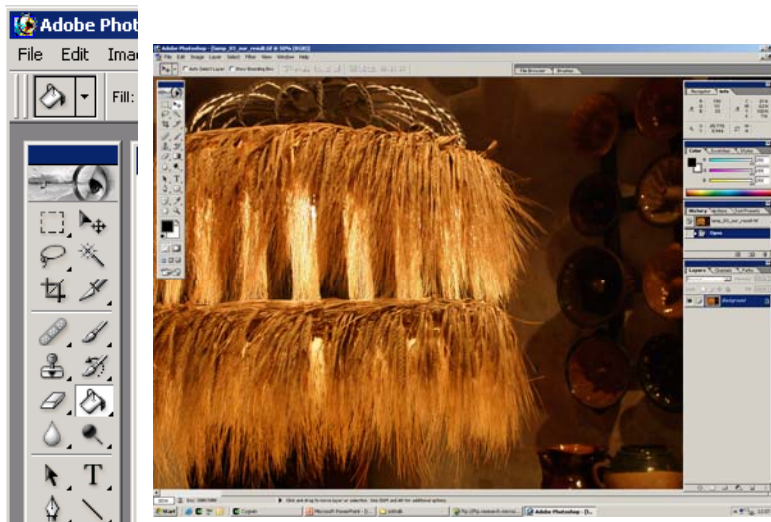
**NetInfo Error**  
NetInfo read failed! (Operation succeeded)  
OK



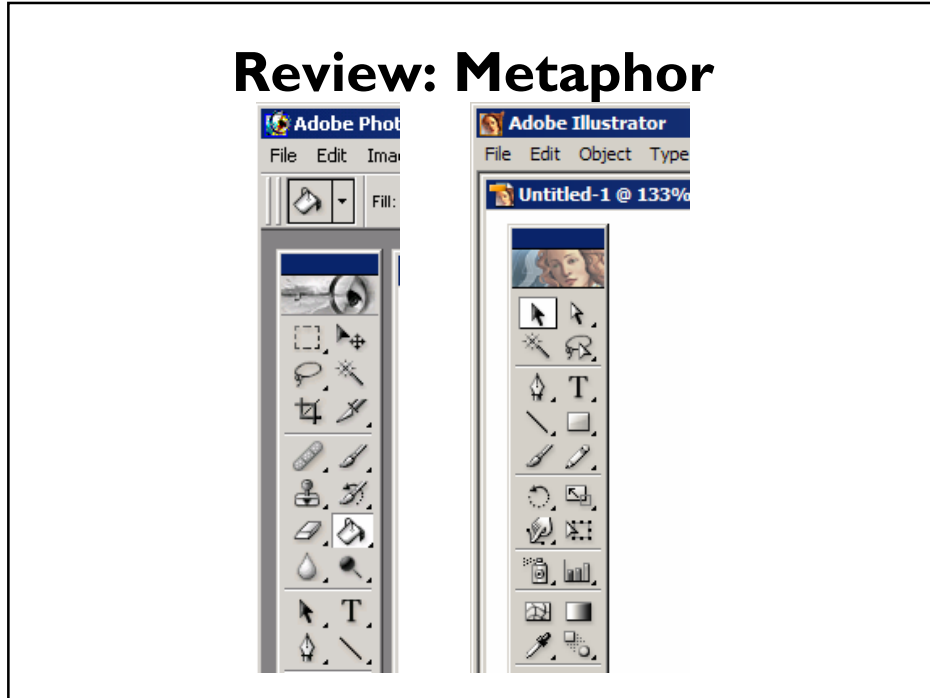
# Review: The Action Cycle



# Review: Metaphor



## Review: Metaphor



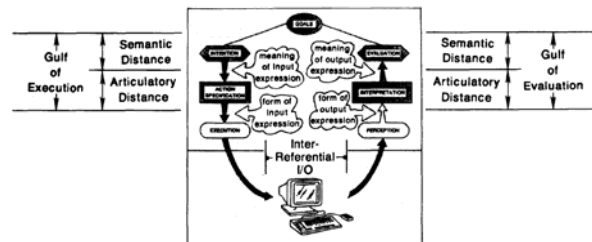
## Review: Direct Manipulation

### Direct Manipulation

- An interface that behaves as though the interaction was with a real-world object rather than with an abstract system

### Central ideas

- Visibility of the objects of interest
- Rapid, reversible, incremental actions
- Manipulation by pointing and moving
- Immediate and continuous display of results



## Review: Cognition

### Cognetics

- Ergonomics of the mind
- Study of “engineering scope of our mental abilities”



Jef Raskin

### Cognitive Conscious/Unconscious

- What is the last letter in your first name?

### Locus of Attention

- Idea/object/event which you are intently thinking about
- Focus implies volition; locus not always consciously controlled

## Due Next Time (before class)

### Contextual Inquiry and Task Analysis

- Should be done with interviews
- Performing task analysis
- Designing interface
  
- Submit on web and ...
- Hand in printout at beginning of class

## More Announcements

### Group Brainstorm (20 pts)

- Mean 18.64
- Stdev 1.10

### Office Hours

- Maneesh: Tue/Th 5-6pm, and by appointment
  - Soda Hall 635

## Topics

- Error Messages
- Modes
- Depicting Processes
- Storyboarding

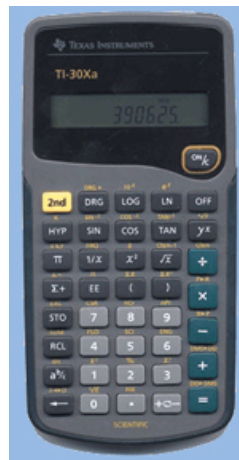


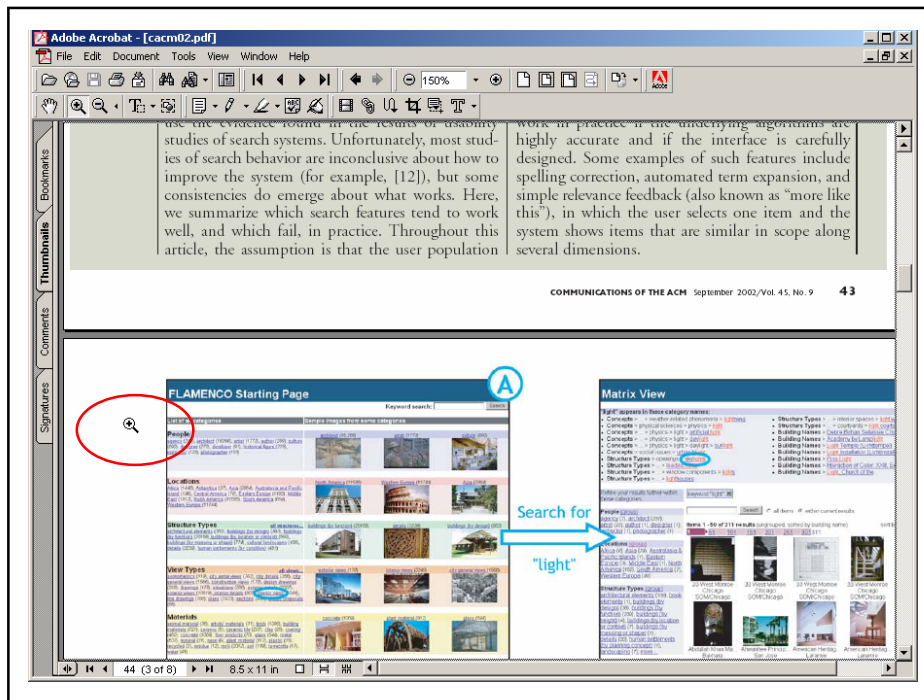
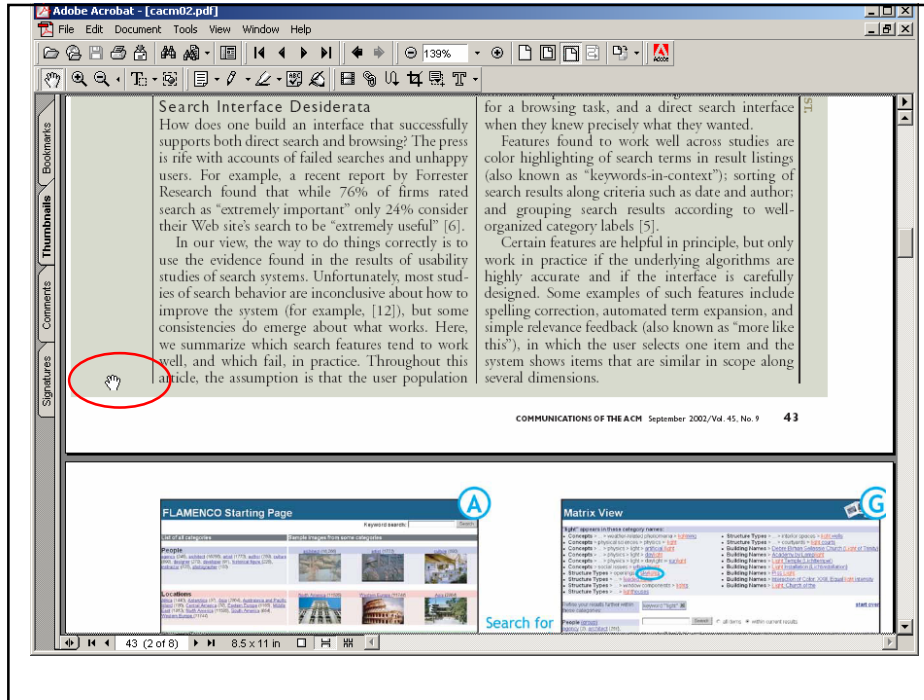
# Modes

## Modes: Definition

What are they?

- The same user actions have different effects in different situations.
- Examples?
  - Keycaps lock





## Using Modes in Interfaces

When are they useful?

- Temporarily restrict users' actions
- When logical and clearly visible and easily switchable
  - Drawing with paintbrush vs. pencil
  - Autocorrect (if easy to switch the mode)

Why can they be problematic?

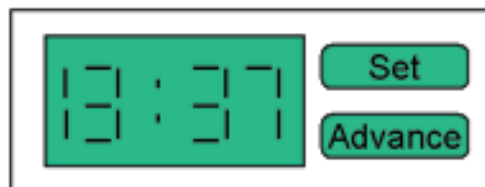
- Big memory burden
- Source of many serious errors

How can these problems be fixed?

- **Don't use modes – redesign system to be modeless**
- Redundantly visible

## Redesigning to Avoid Modes

Setting the time on a clock



Modal

## Redesigning to Avoid Modes

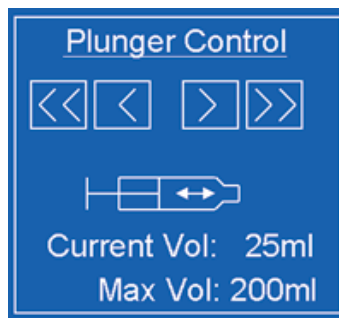
Setting the time on a clock



Modeless

## Modes are Sometimes Good

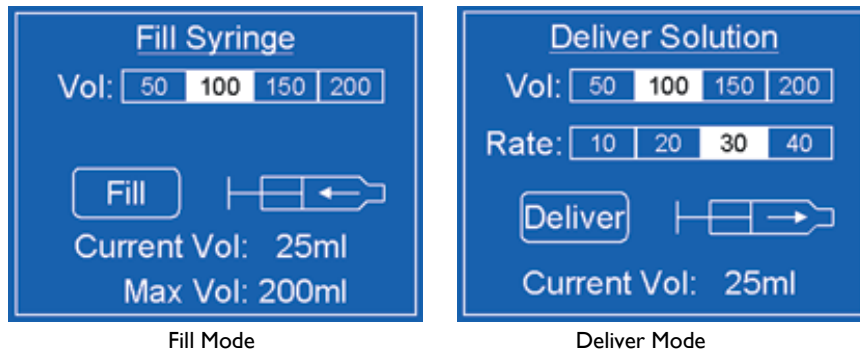
Fill and empty syringe



Modeless

## Modes are Sometimes Good

When task requires switching modes, interface may also contain modes



## Quasimodes

Set **and hold** a mode via conscious, continuous action

- Shift key to capitalize (vs. Caps Lock)
- Foot pedal that must remain pressed
- Pull down menus
- Muscle tension reminds users they are holding a mode

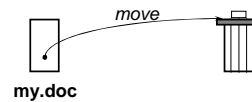


Also known as “spring-loaded modes”

## Noun-Verb VS Verb-Noun

Noun-Verb: Select object, *then* perform action

- Emphasizes 'nouns' (objects) rather than 'verbs' (actions)



Verb-Noun: Select action, *then* choose object to perform on

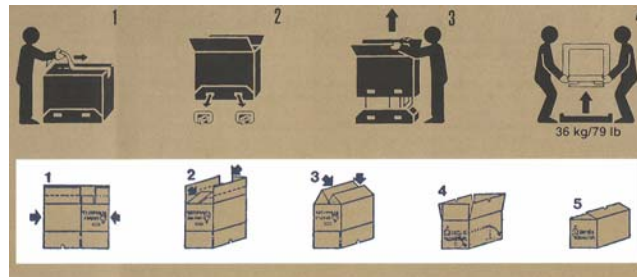
- Emphasizes verbs' (actions) rather than nouns' (objects)

Advantages of Noun-Verb

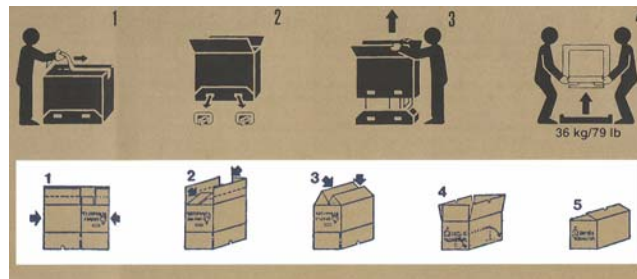
- Error reduction: Verb-noun requires selecting action (mode) then applying it
- Actions always within context of object
  - Inappropriate actions can be hidden

## Depicting Processes

## What is a Process?



## What is a Process?



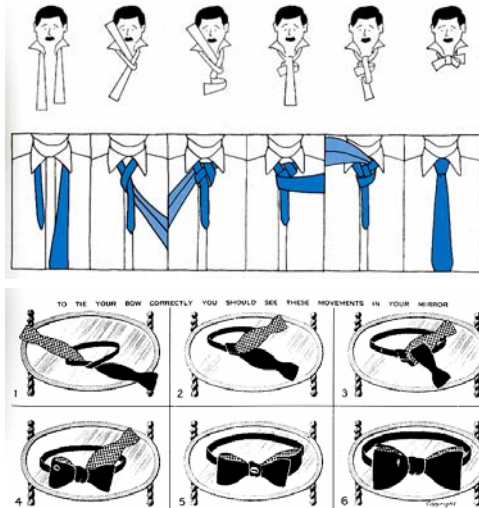
Process: A series of actions or operations conducting to an end

- Series → Time
- End → Goal

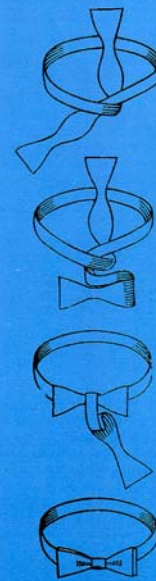
# Lego Assembly Instructions



# Putting on a tie



## Instructions to Tie





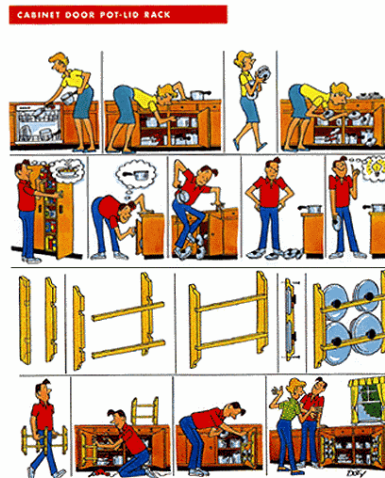
# Creating the Narrative

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

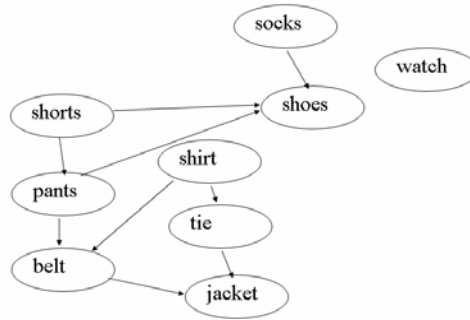
- What is unit of action?
- Sub-steps within steps



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 &amp; 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>

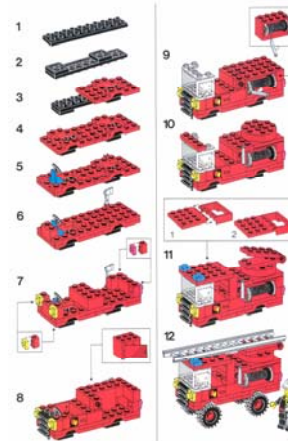
[Orth 01]

# 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

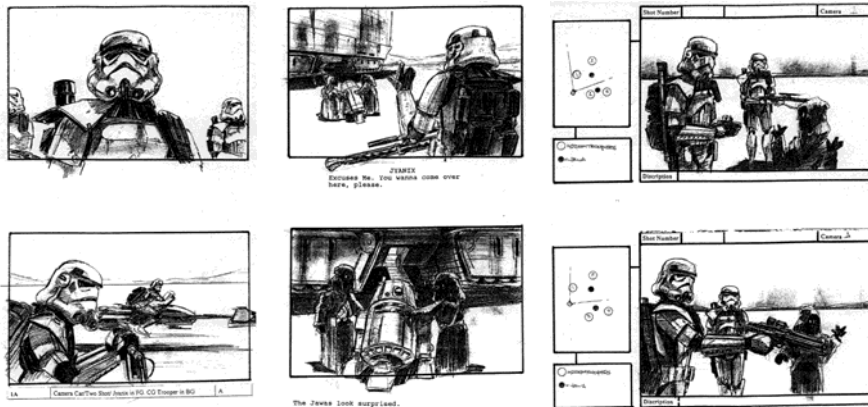
## Images (Very important for interface design)

- 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

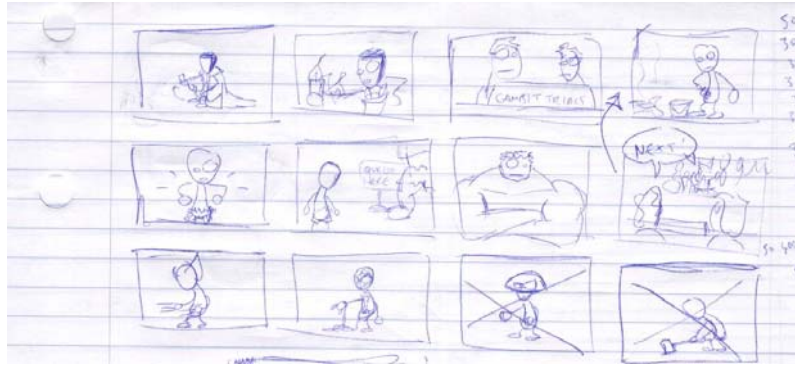
In Interface Design

## Troops



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

# Comics



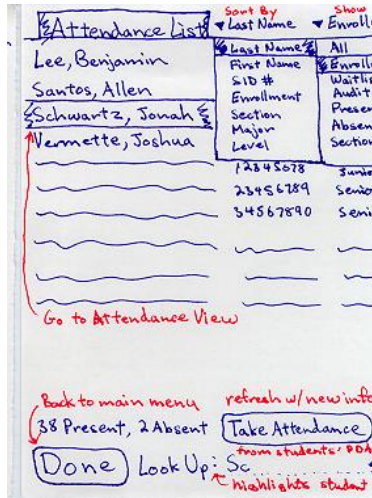
From: [http://www.deviantmag.com/issue03/images/comichowto/rough\\_storyboarding.jpg](http://www.deviantmag.com/issue03/images/comichowto/rough_storyboarding.jpg)

## 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 1<sup>st</sup> frame (establishing shot)
  - Relationship between the user and its environment
  - Relationship between the user and the system

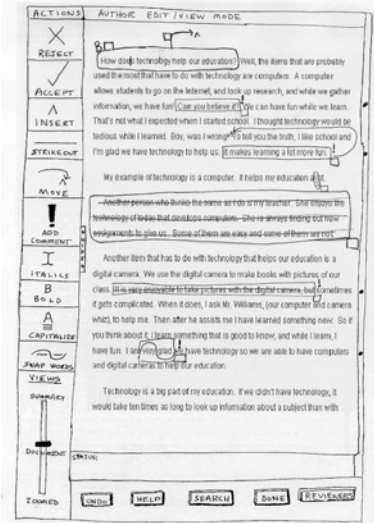
## Sketch: Single Display



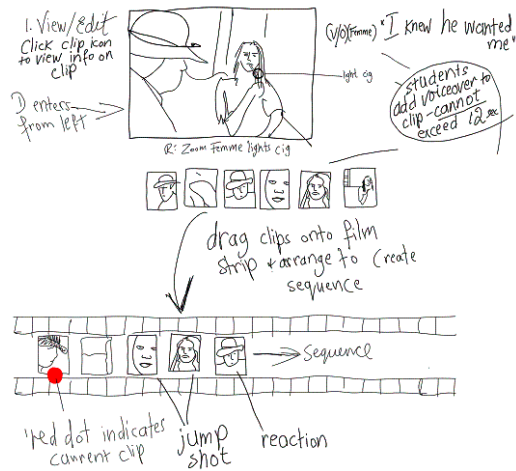
## Sketch: Single Display



# Sketch: Single Display



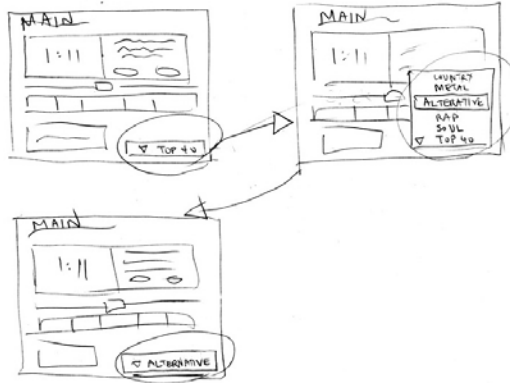
# Sketch: Single Display



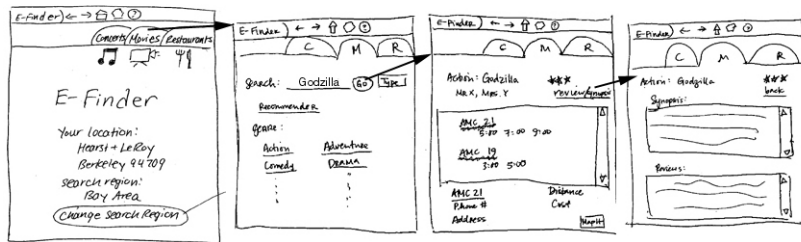
Film Editing Interface

# Storyboards: Multiple Frames

SCENARIO 1 "I want to listen to alternative music"

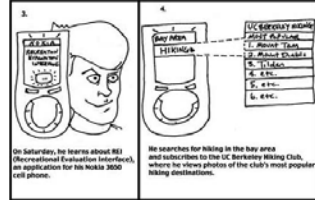
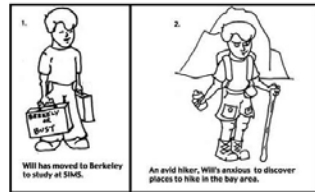


# Storyboards: Multiple Frames





# Storyboards



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