

# CSE 440: Introduction to HCI

## User Interface Design, Prototyping, and Evaluation

Lecture 08:  
Storyboarding

James Fogarty  
Daniel Epstein  
Brad Jacobson  
King Xia

Tuesday/Thursday  
10:30 to 11:50  
MOR 234



# Tasks in Design

Tasks guide your exploration of a design

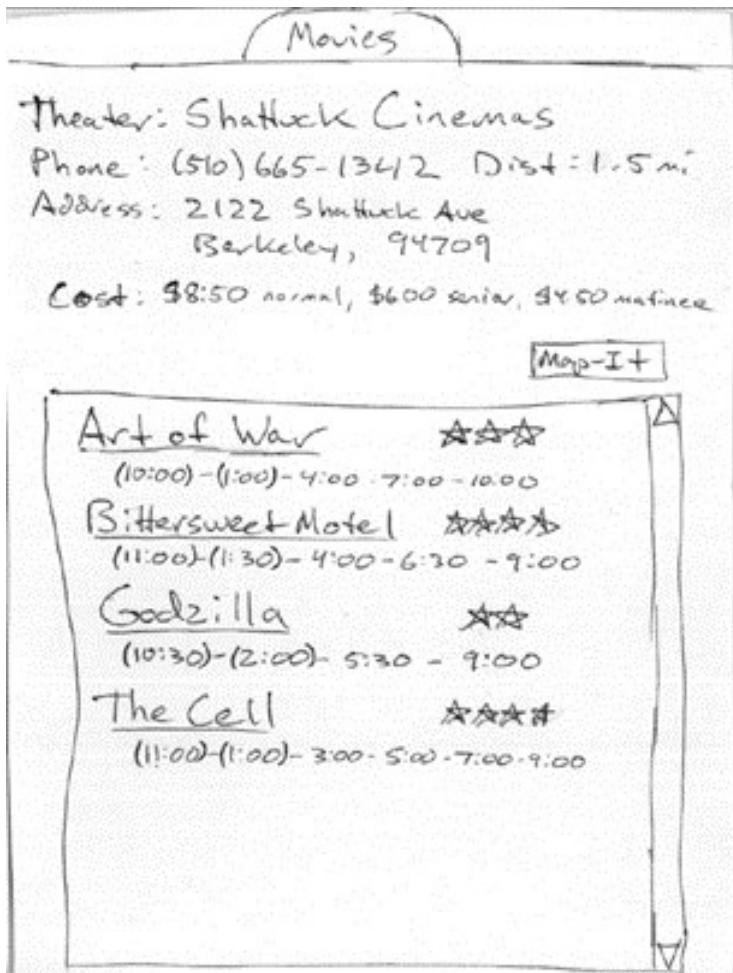
Creating scenarios for each task illustrates

what a person does

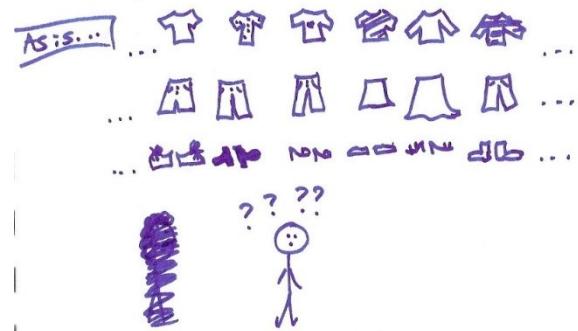
what they see

step-by-step performance of task

# Sketching



## STORE FOR THE STYLE-CHALLENGED

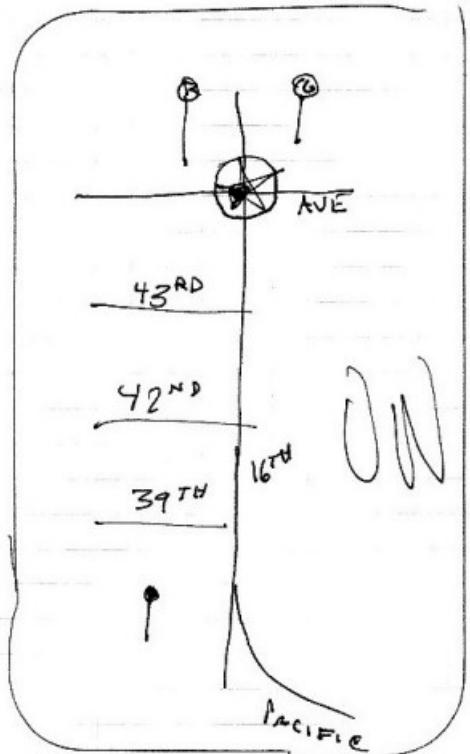


### As it should be...

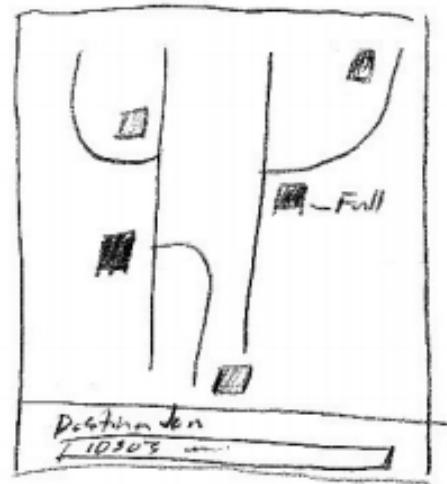


(pre-selected to match so you don't  
have to choose.)

# Sketching



MAP SHOWING PARKING  
AVAILABILITY BASED ON INPUTTED  
DATA, INPUTTED ON MAP



- different colors
- highlights availability
-

# Sketching and Storyboards

The sketch illustrates a user interface for an attendance list. At the top, there are sorting options: "Sort By" (Last Name, Enrollment) and "Show" (All, Enrollment, Waitlist, Audit, Present, Absent, Section). The main area displays a table of student records:

Last Name	All
Lee, Benjamin	Enrollment
Santos, Allen	Waitlist
Schwartz, Jonah	Audit
Nermette, Joshua	Present
	Absent
	Section

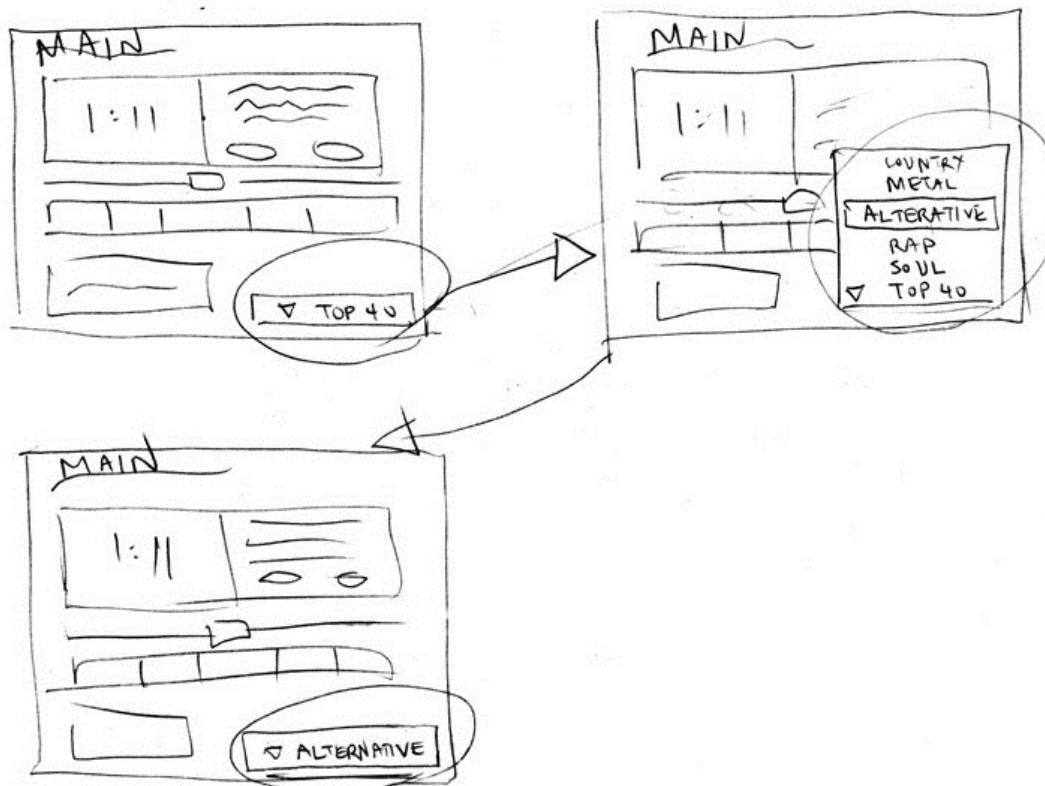
Below the table, a red arrow points from the text "Go to Attendance View" to the "Absent" row. At the bottom, there are several buttons and annotations:

- "Back to main menu" (with a red arrow pointing to the left)
- "refresh w/ new info"
- "38 Present, 2 Absent" (with a red arrow pointing down to the "Done" button)
- "Take Attendance" (in a rounded rectangle)
- "from students' PDA" (written below "Take Attendance")
- "Done" (in a rounded rectangle)
- "Look Up: Sc" (written next to "Done")
- "highlights student" (written in red at the bottom right)

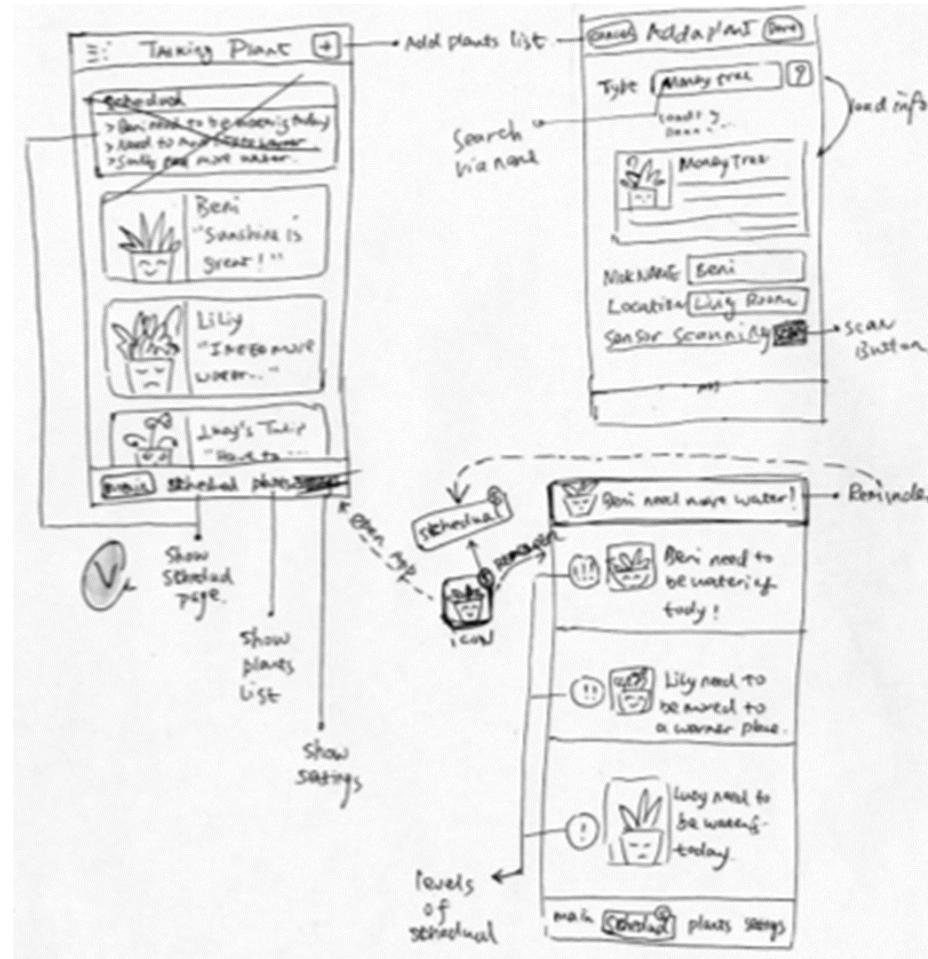
# Sketching and Storyboards

SCENARIO 1

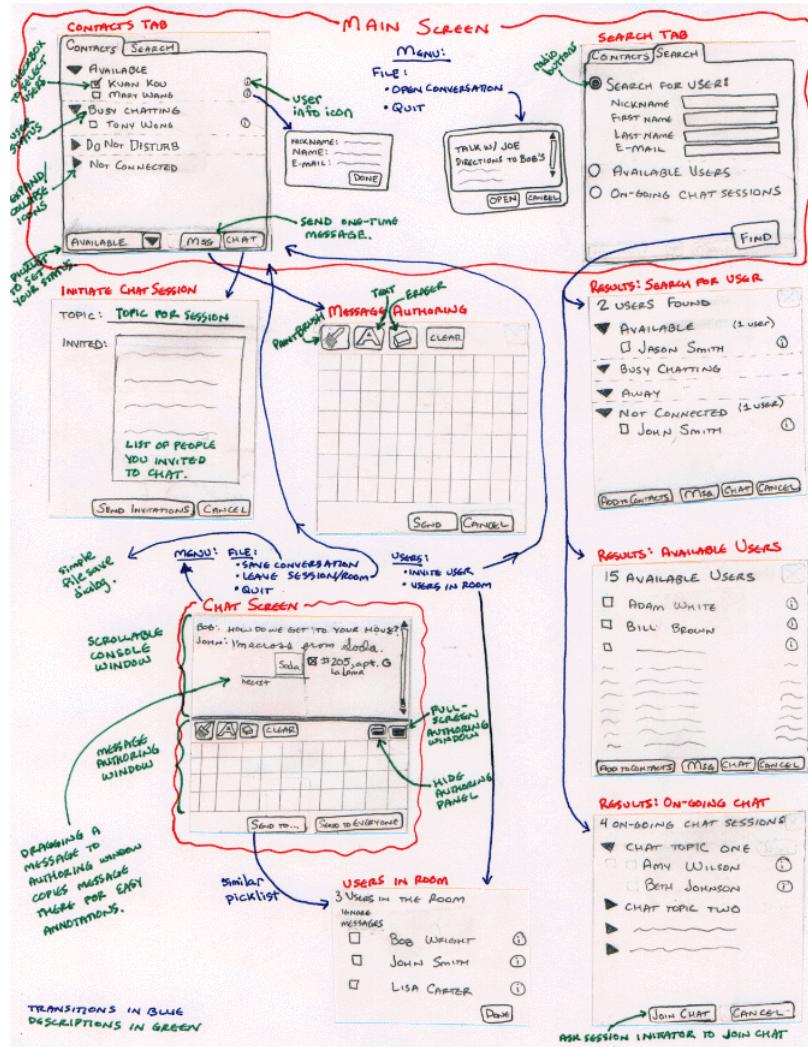
"I want to listen to alternative music"



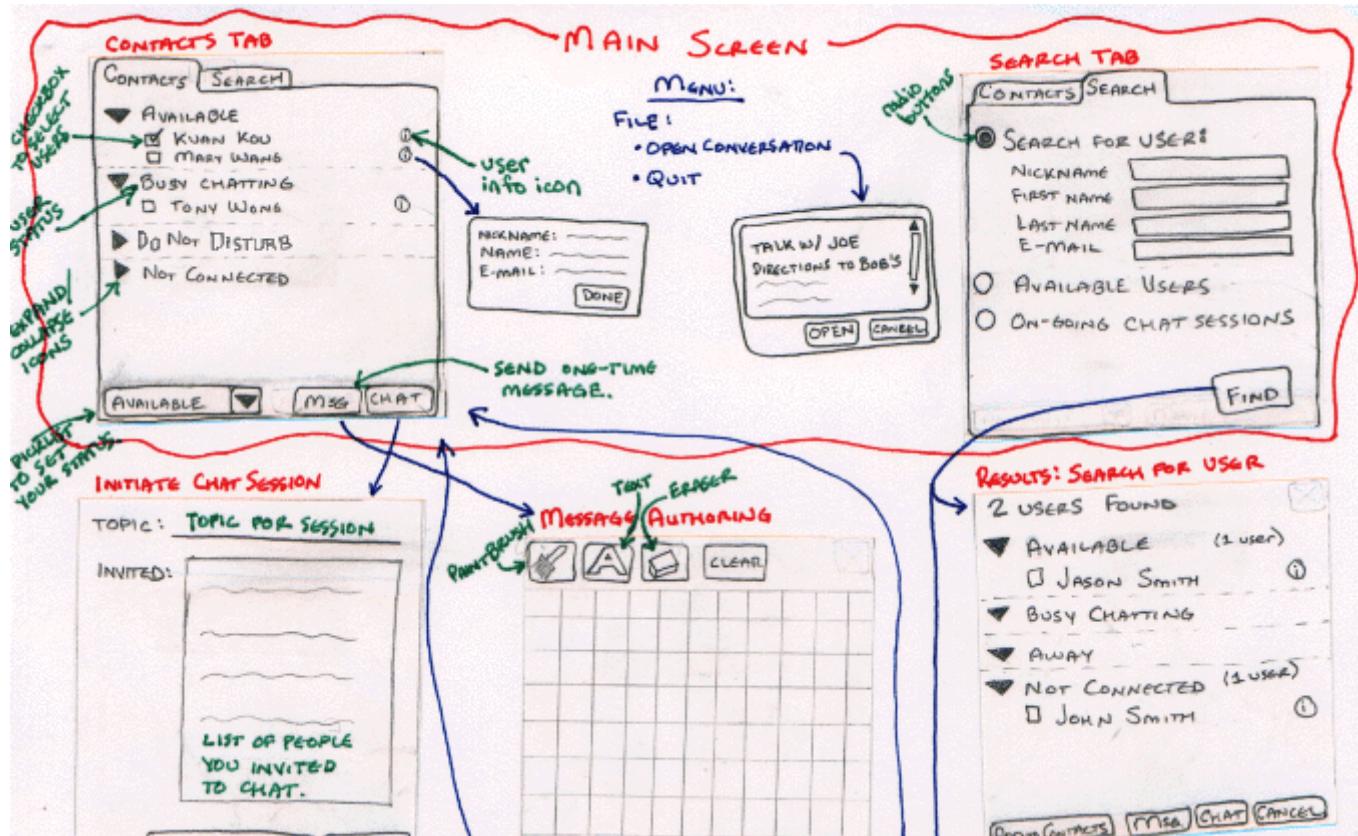
# Sketching and Storyboards



# Sketching and Storyboards



# Sketching and Storyboards



# Illustrating Time

Storyboards come from film and animation

Give a “script” of important events

leave out the details

concentrate on the important interactions



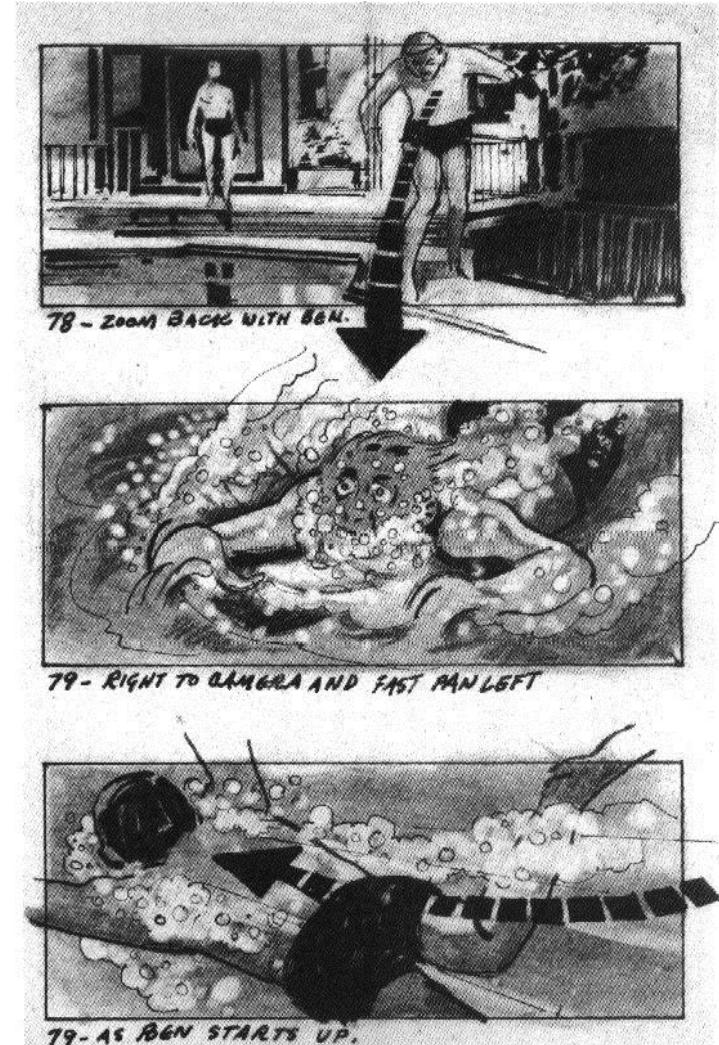
# Storyboards

Can be used to explore

Much faster and less expensive to produce

Can therefore explore more potential approaches

Notes help fill in missing pieces of the proposal



# Storyboards

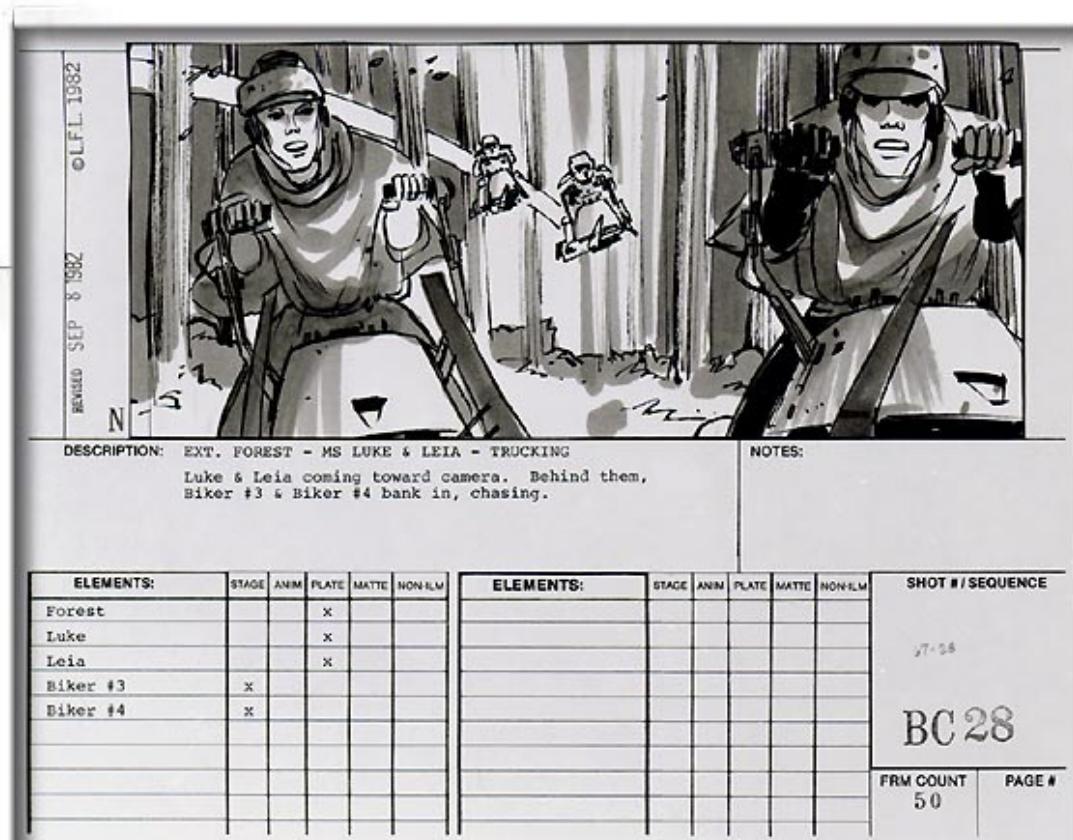
Can be used to convey

Effective storyboards can quickly convey information that would be difficult to understand in text

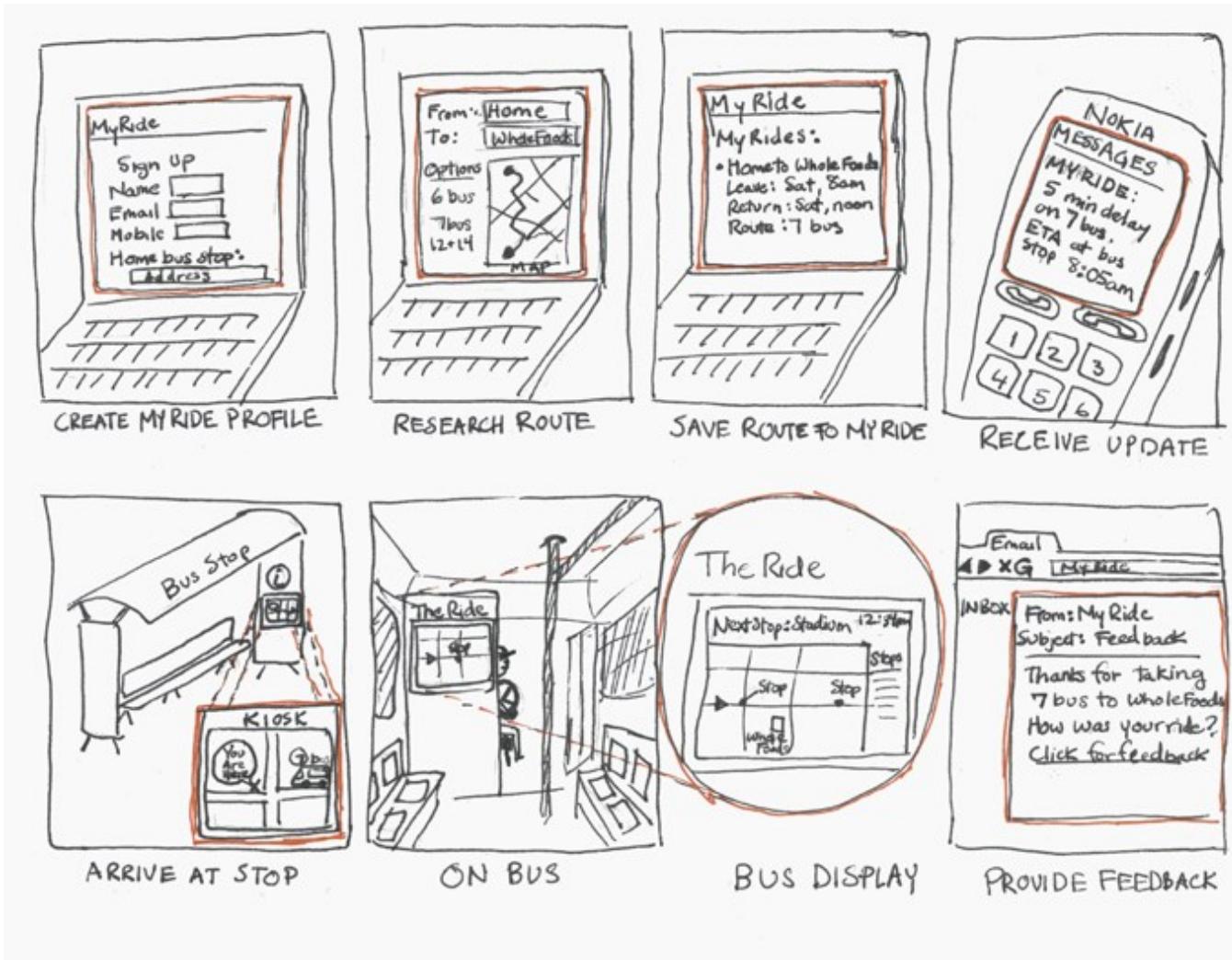


# Storyboards

Can illustrate key requirements and leave open less important details of design



# Basic Storyboard



# Storytelling

Stories have an audience

Other designers, clients, stakeholders,  
managers, funding agencies, potential end-users

Stories have a purpose

Gather and share information about people, tasks, goals

Put a human face on analytic data

Spark new design concepts and encourage innovation

Share ideas and create a sense of history and purpose

Giving insight into people who are not like us

Persuade others of the value of contribution



# Stories Provide Context

Characters

Who is involved

Setting

Environment

Sequence

What task is illustrated

What leads a person to use a design

What steps are involved

Satisfaction

What is the motivation

What is the end result

What need is satisfied

Details of interface features and components are not necessarily surfaced, they can often be developed and conveyed more effectively with other methods

Can help surface details that might otherwise be ignored

Grocery store application:

- use with one hand while pushing a shopping cart
- privacy of speech input
- split attention



University of  
Washington

Amal Dar Aziz

# Storytelling

## Good stories

- Understand audience
- Provide context of use
- Are well-motivated
- Memorable
- Evokes a reaction
- Evokes empathy
- Illustrate experience
- Convey emotions
- Short and to-the-point

## Bad stories

- Do not account for audience
- Boring or un-engaging
- Fantastical or unrealistic
- Wrong story for purpose
- Too long to hold attention

tl;dr

# Elements of a Storyboard

Visual storytelling

5 visual elements

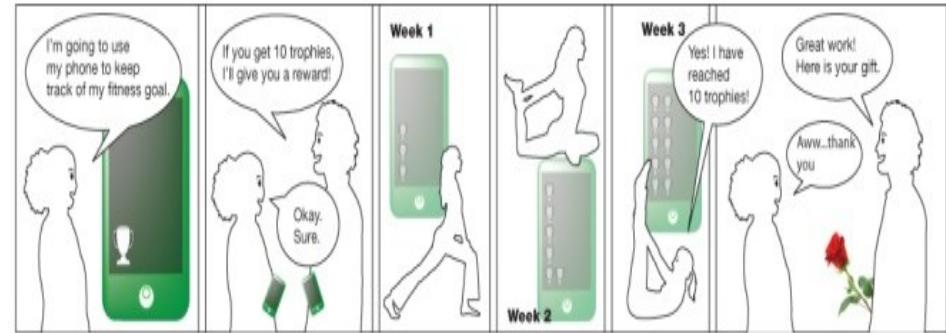
Level of detail

Inclusion of text

Inclusion of people and emotions

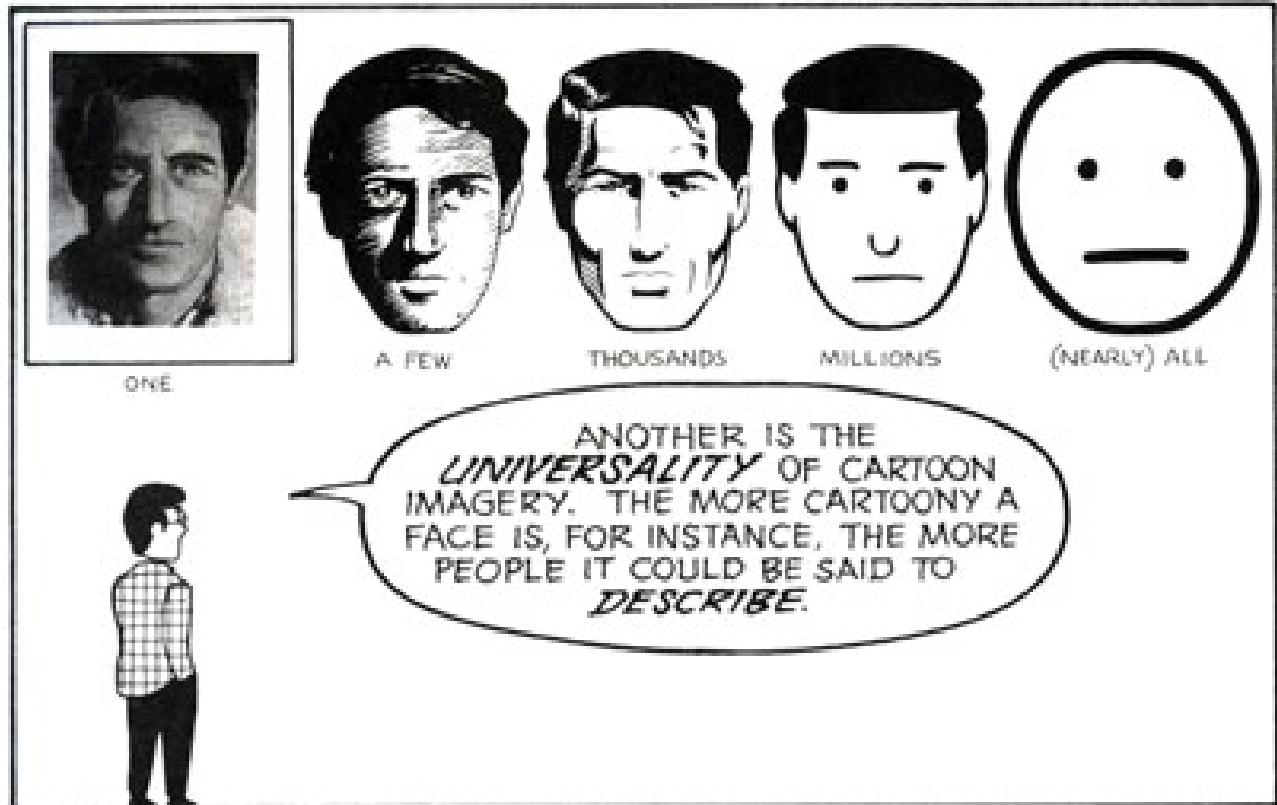
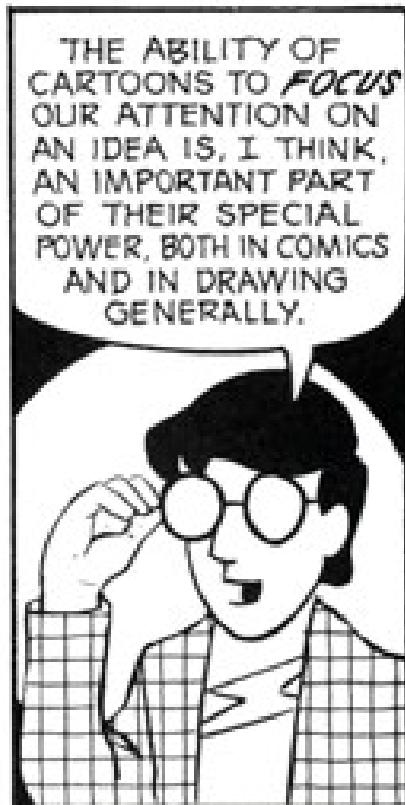
Number of frames

Portrayal of time



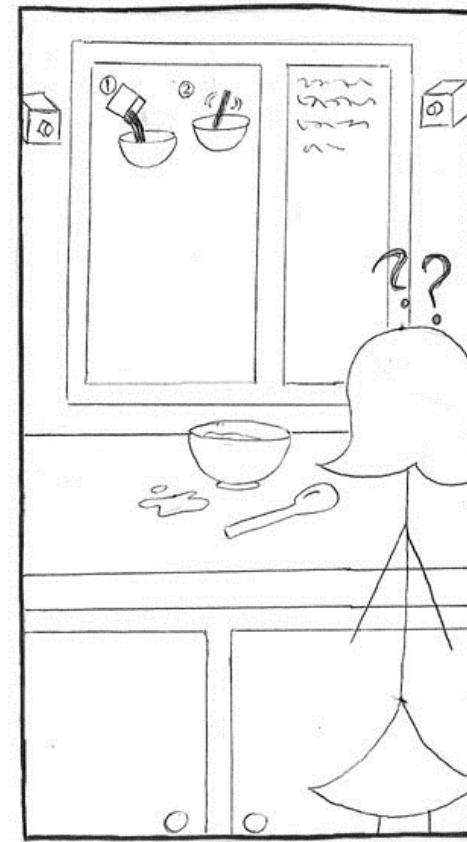
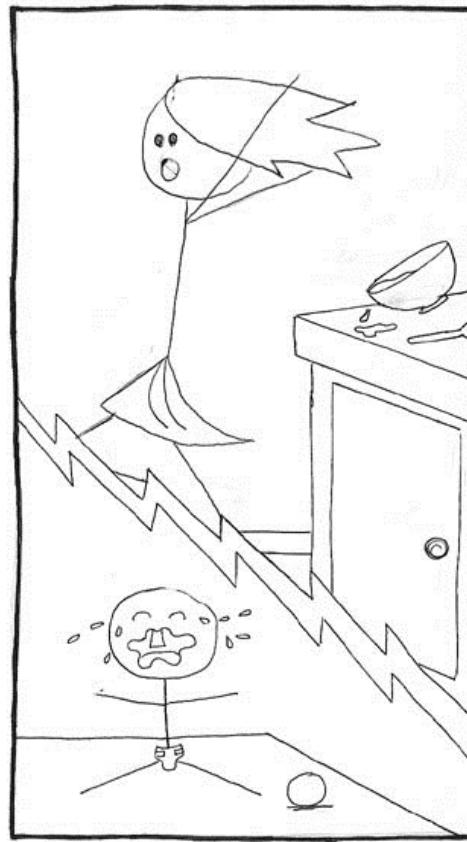
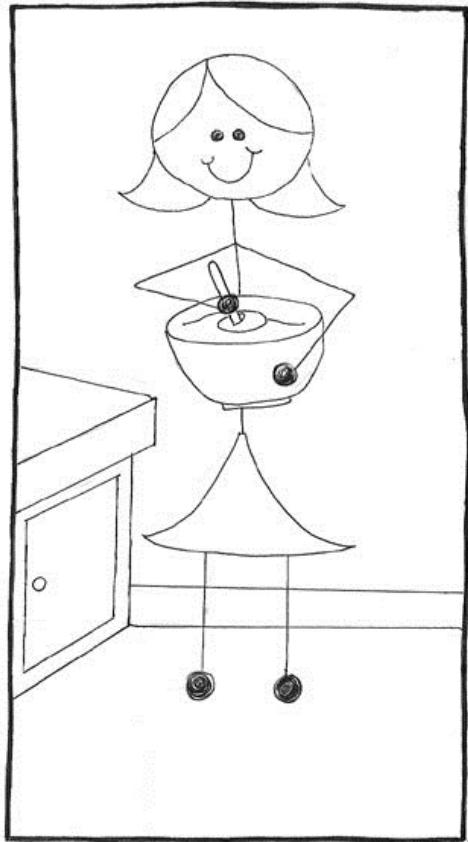
# 1. How Much Detail?

Guideline: too much detail can lose universality



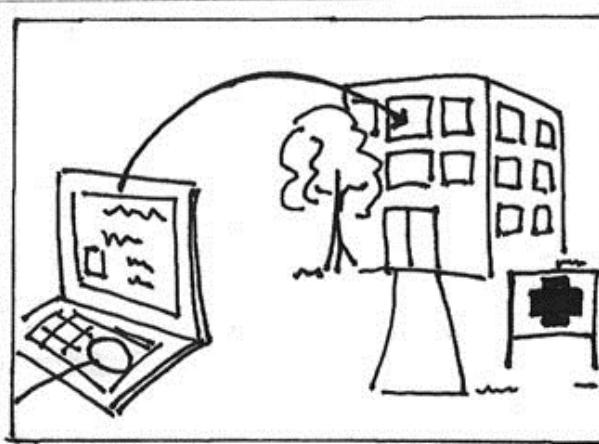
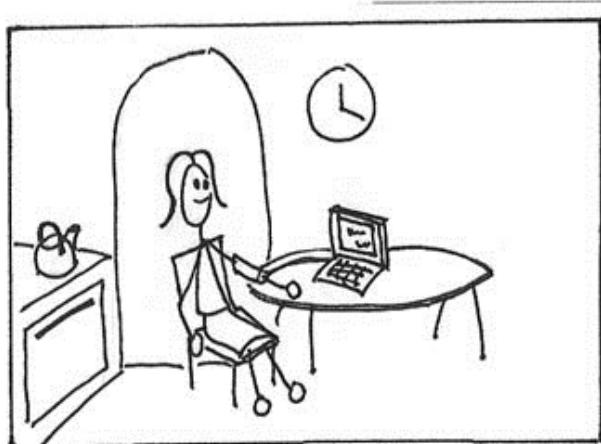
Scott McCloud

# 1. How Much Detail?



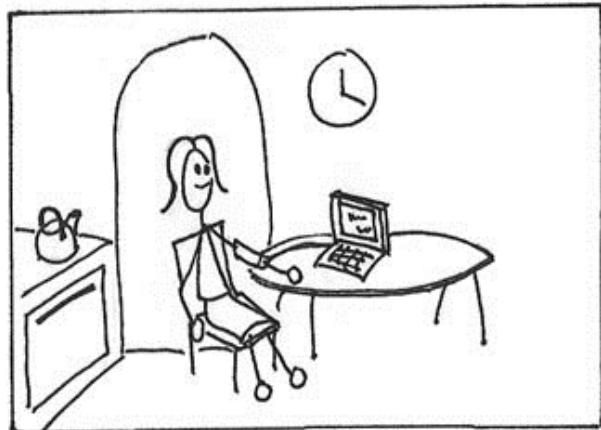
## 2. Use of Text

Guideline: It is often necessary, but keep it short

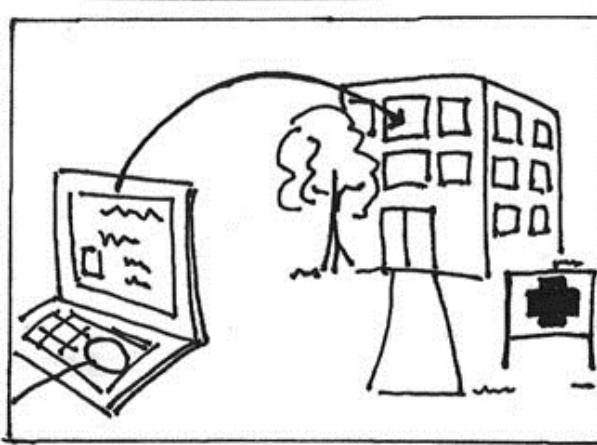


## 2. Use of Text

Guideline: It is often necessary, but keep it short



1. At home, Mary checks her blood pressure.



2. After a few simple key presses, her blood pressure readings get sent to a clinic.



3. The information is made available to her doctor.

### 3. Include People and Emotions

Guideline: Include people experiencing the design and their reactions to it (good or bad)

Remember, the point of storyboards is to convey the experience of using the system

# 4. How Many Frames?

Guideline: 4-6 frames is ideal for end-users

- Less work to illustrate

- Must be able to succinctly tell story

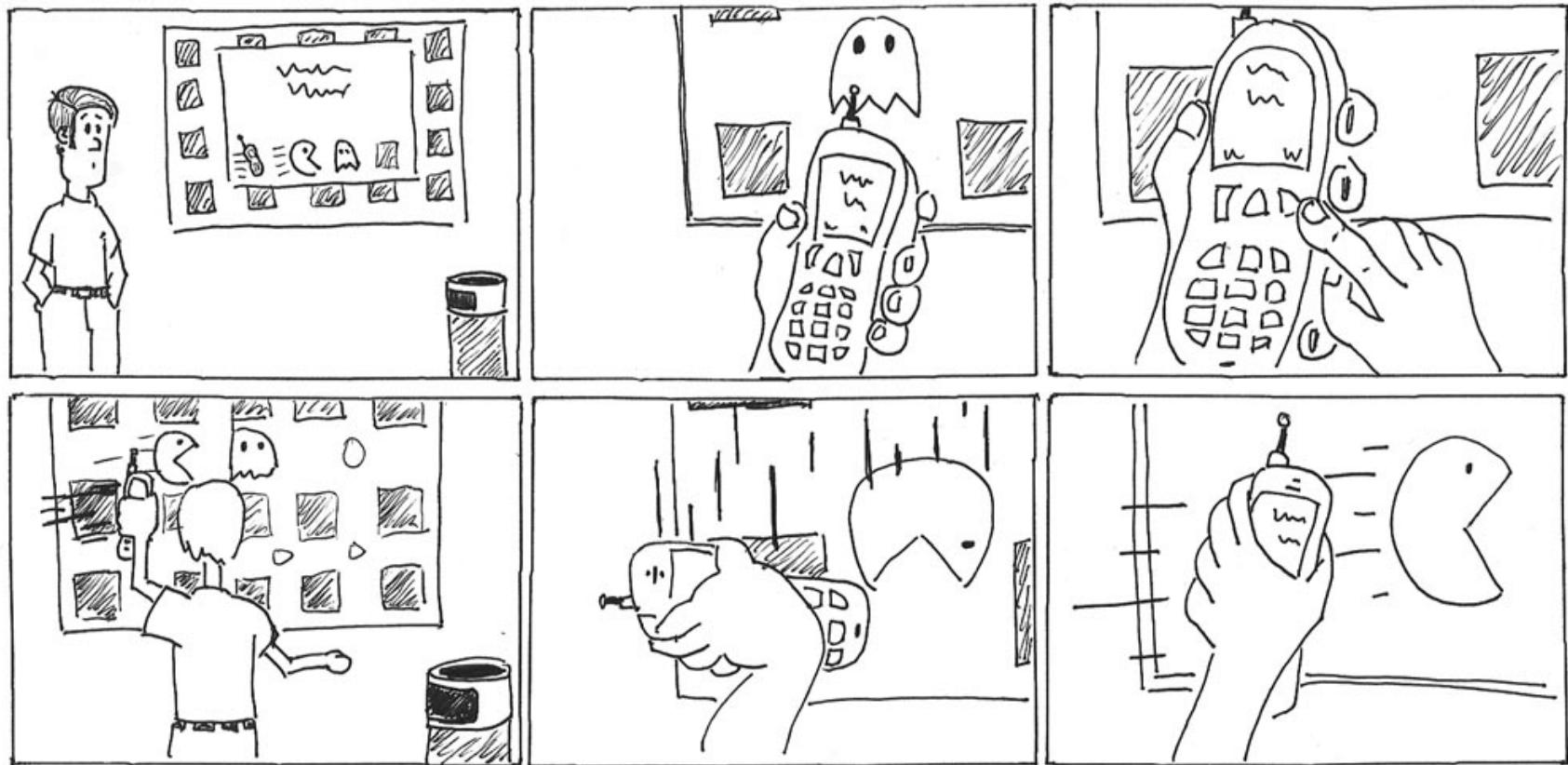
- Potentially longer for design clients

More is not always better

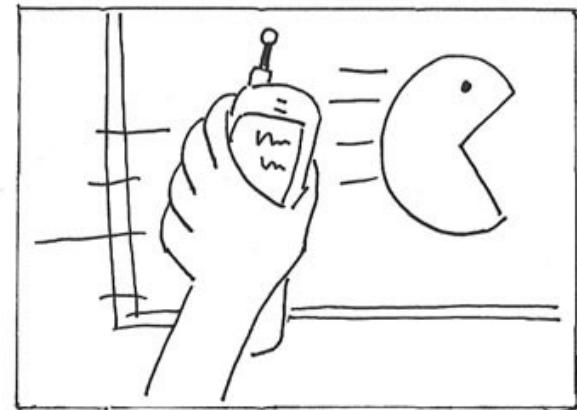
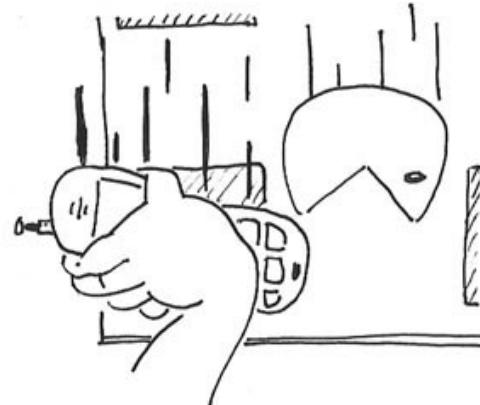
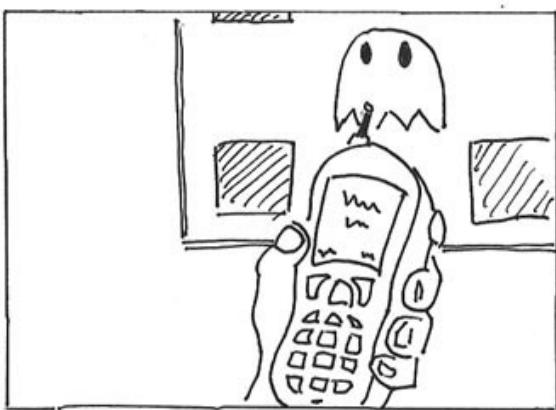
- May lose focus of story

- May lose attention

# 4. How many frames?

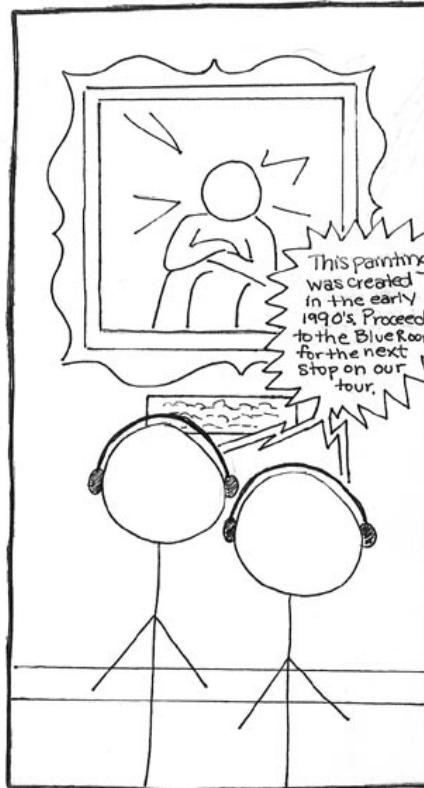
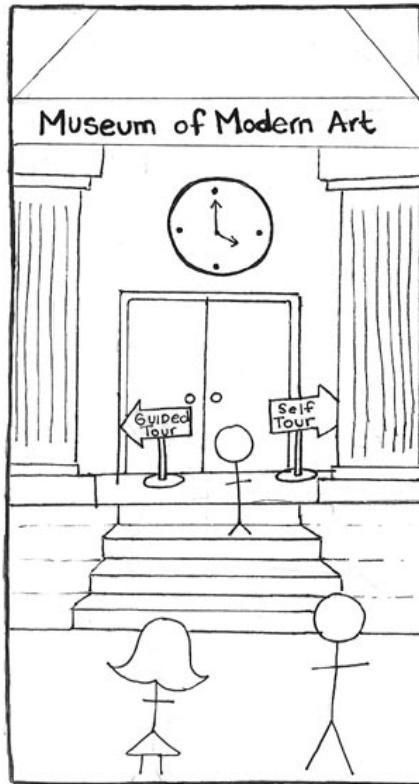


# 4. How many frames?



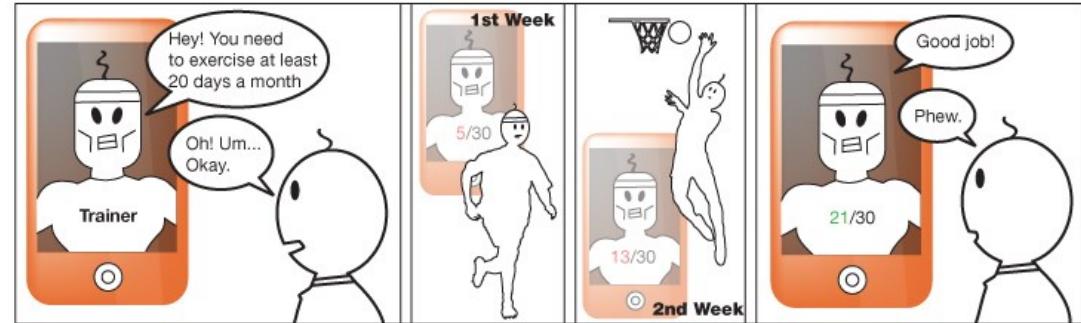
# 5. Passage of Time

Guideline: Only use if necessary to understand



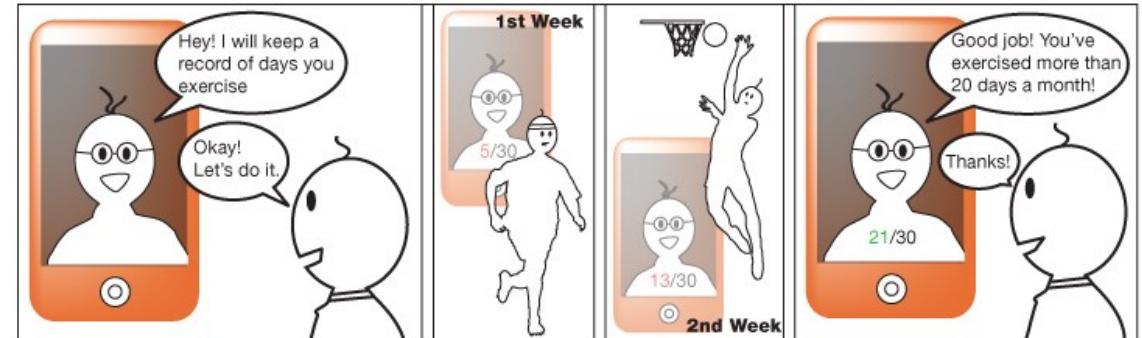
# Storyboards for Comparing Ideas

Authoritative



Cell phone is used to keep track of one's fitness goal.

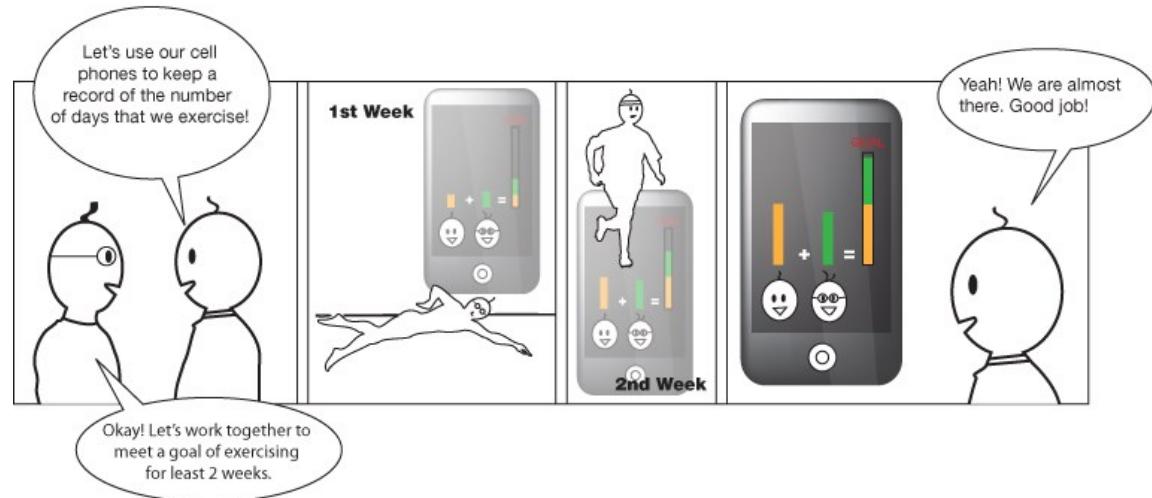
Supportive



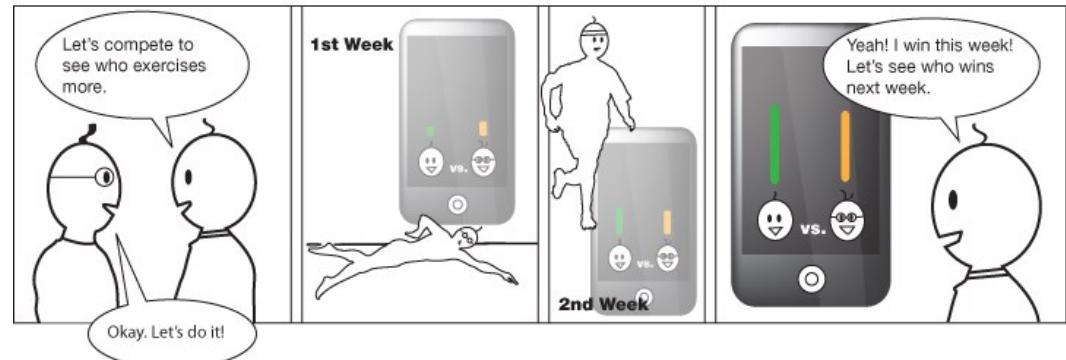
Cell phone is used to keep track of one's fitness goal.

# Storyboards for Comparing Ideas

Cooperative

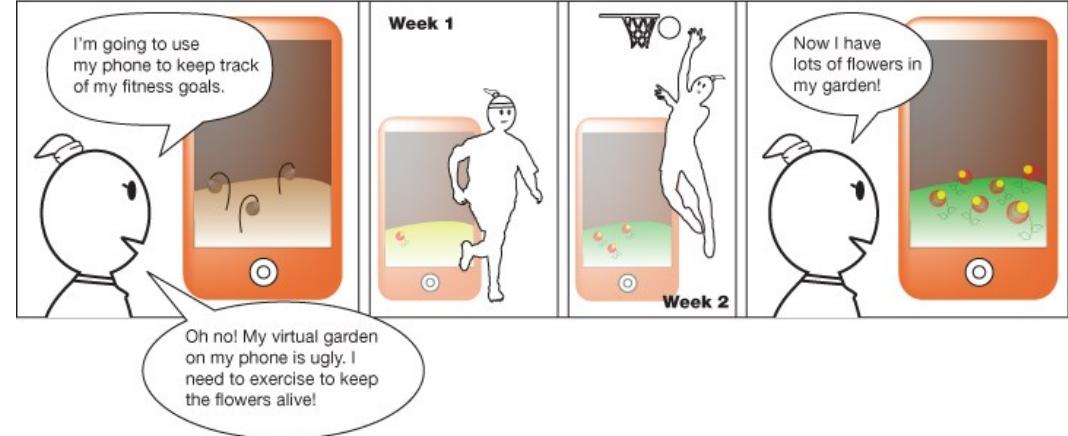


Competitive

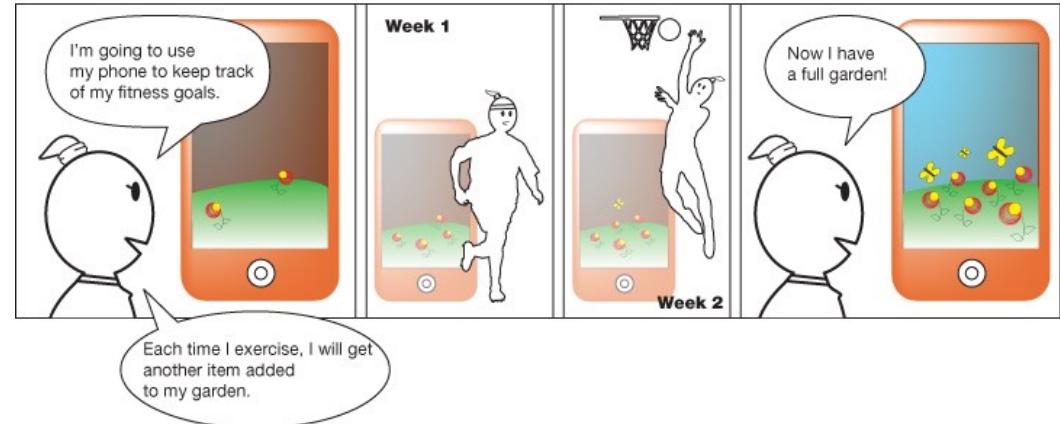


# Storyboards for Comparing Ideas

## Negative Reinforcement



## Positive Reinforcement



# Examples and Tricks in Storyboarding

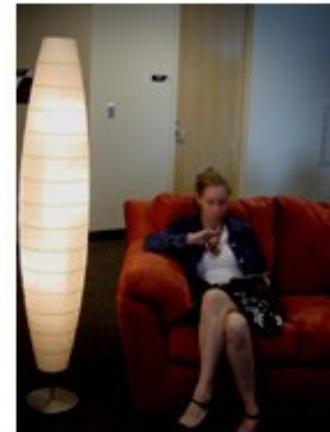
# Drawing is Hard



IT IS SO DARK JANE CAN  
HARDLY READ HER BOOK



SHE GESTURES IN FRONT OF HER  
SPECIAL PENDANT TO TURN ON  
THE LIGHTS



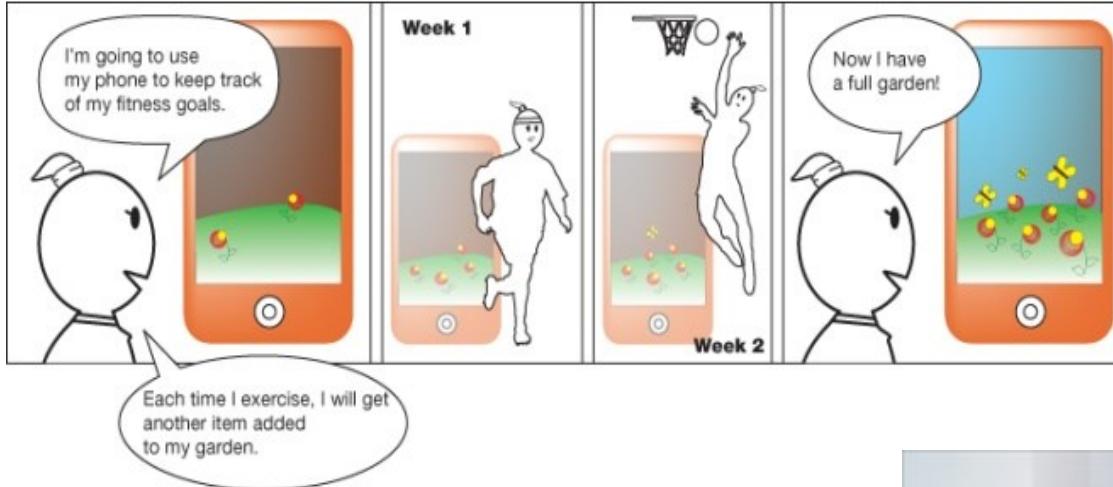
THE LIGHTS TURN ON!



FINALLY, SHE CAN  
READ HAPPILY.

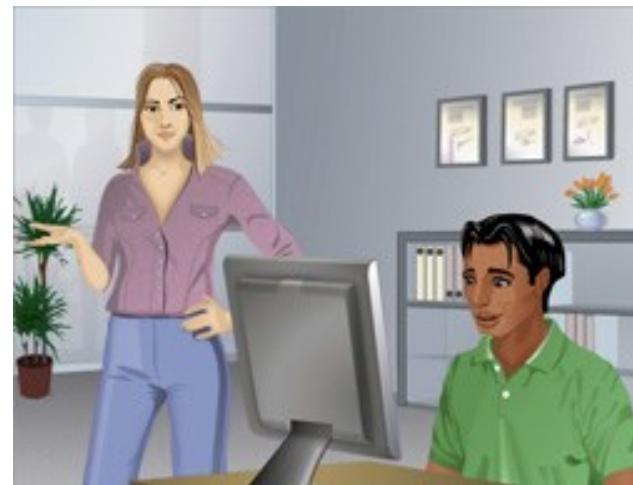
Will a picture work instead?

# Existing Images from Other Sources



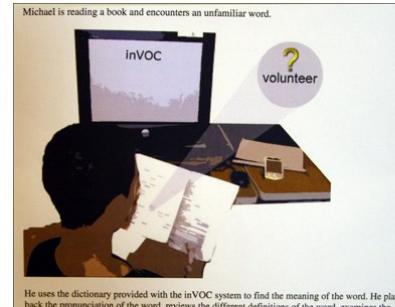
<http://designcomics.org/>

<http://www.pdclipart.org/>

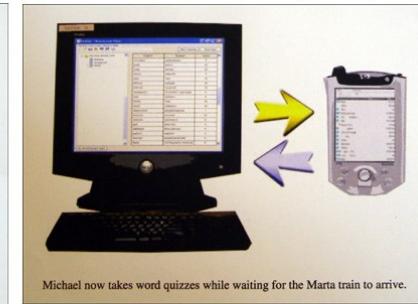


# Blur Out Unnecessary Detail

Using image editing software to simplify photos into sketches



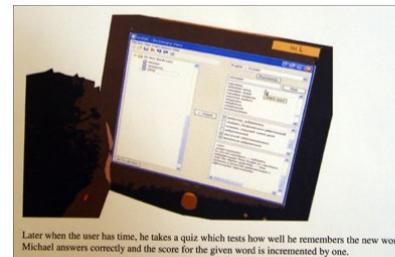
He uses the dictionary provided with the inVOC system to find the meaning of the word. He plays back the pronunciation of the word, reviews the different definitions of the word, examines the word usage and then selects the definitions he is interested in and imports them into a new words list.



Michael now takes word quizzes while waiting for the Marta train to arrive.



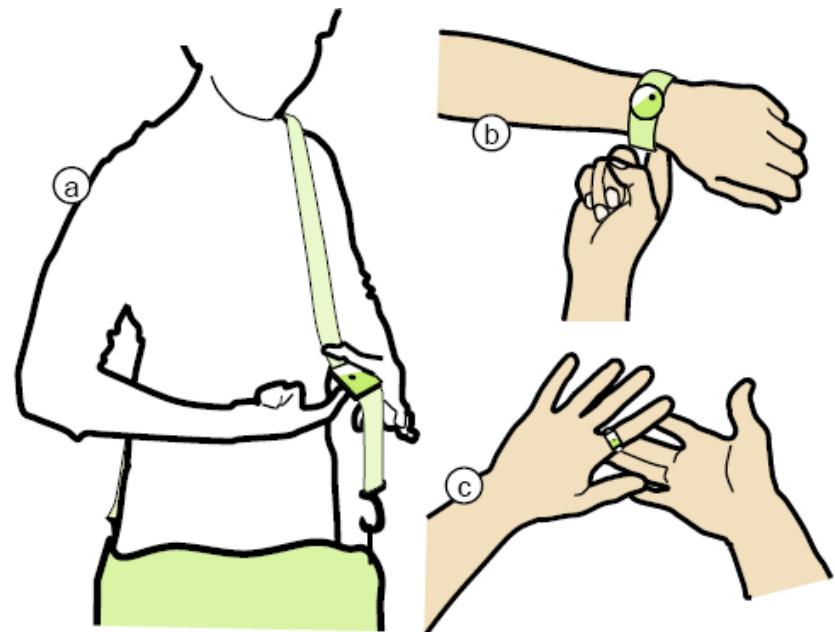
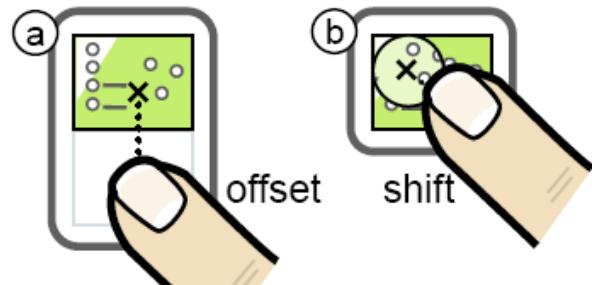
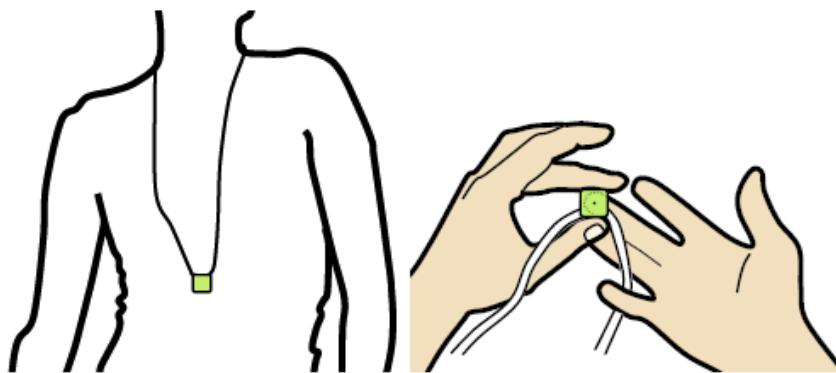
Michael then has to go to school. He rides Marta and would like to use the travel time for studying new words. He synchronizes the inVOC database with his PocketPC device.



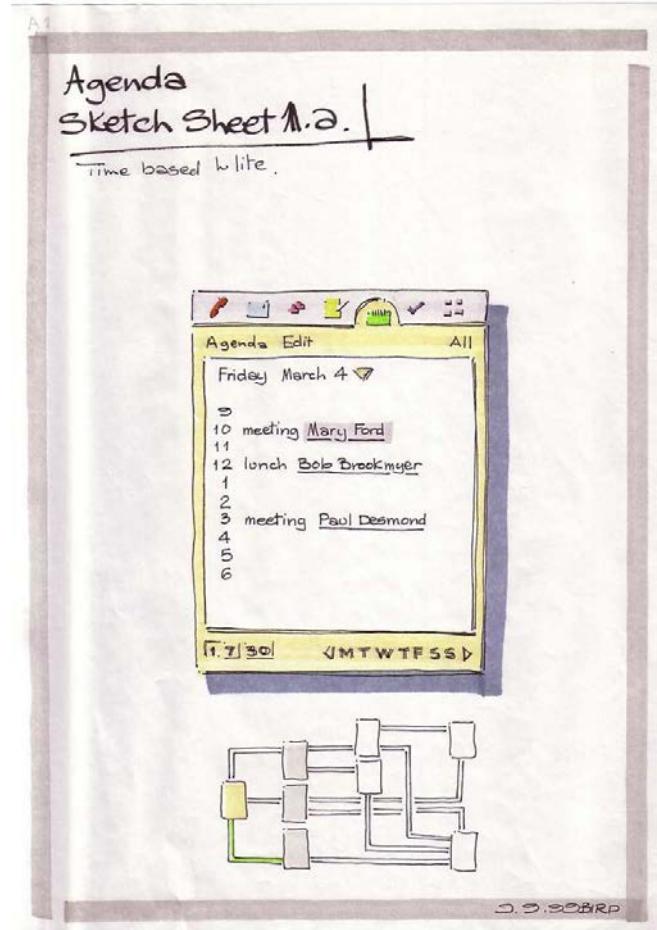
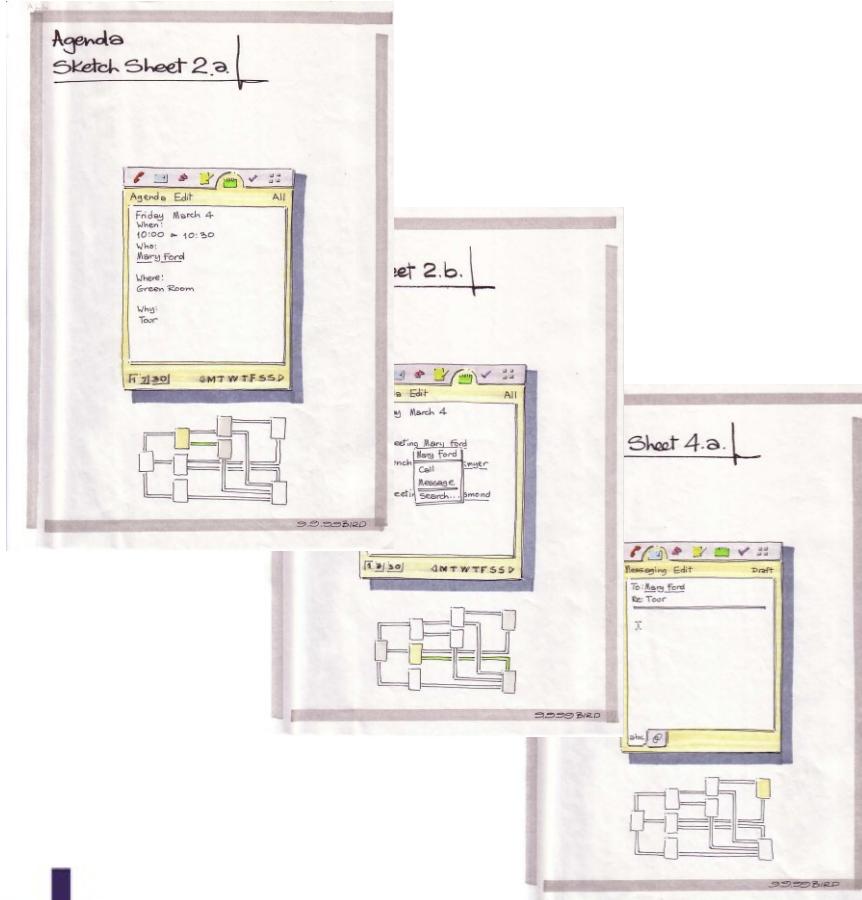
Later when the user has time, he takes a quiz which tests how well he remembers the new word. Michael answers correctly and the score for the given word is incremented by one.



# Tracing Photos



# Mapping the Space of Interaction



# Comic Presentation

Thought bubbles argue for the design



LATER THAT SAME YEAR...

Good bike repair shops on Capitol Hill? mackenziefab

Need help figuring out safe bus route District to Fremont! ridefreezone

Special critical mass tomorrow in downtown bike lanes! ballarddot

What's your favorite fun-ride on the eastside? mwhiker

last post replies

7

4

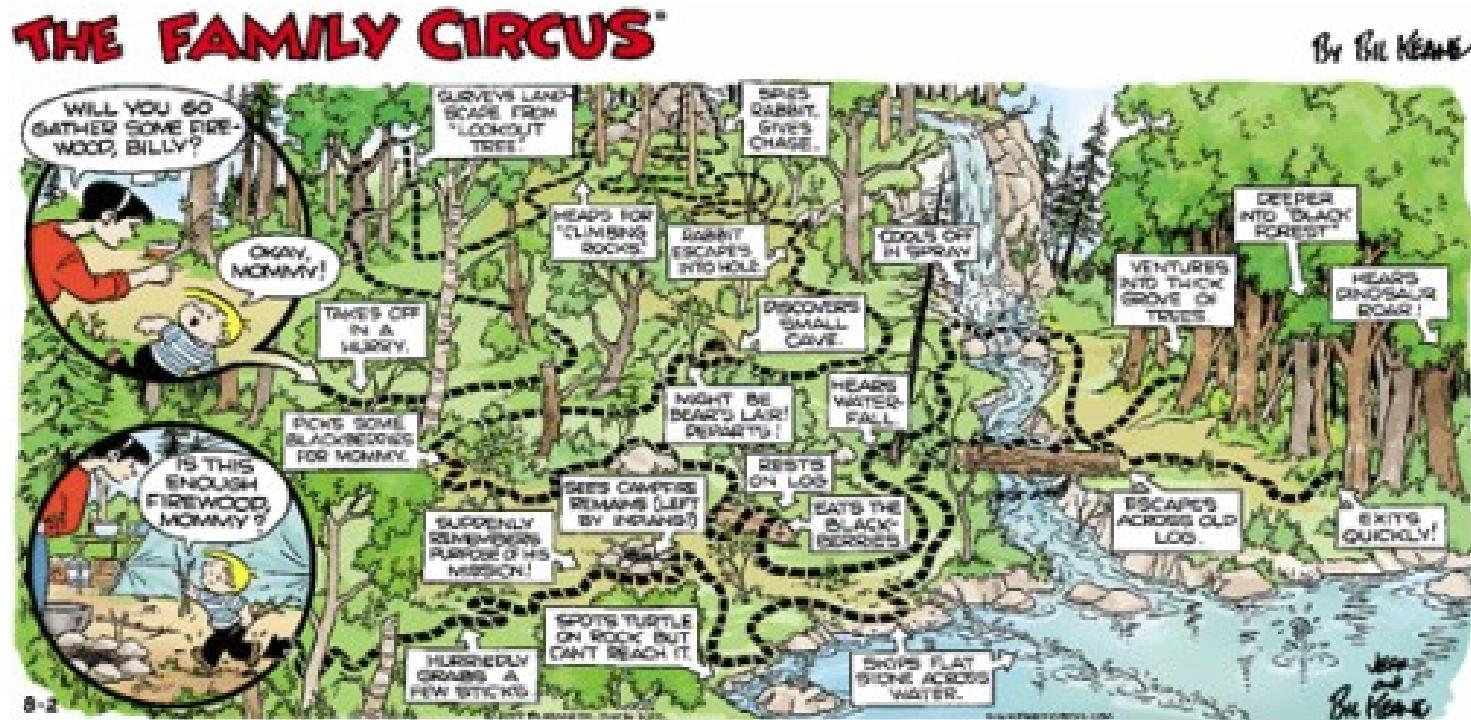
14

MORE BIKE LANES DOWNTOWN WOULD MAKE MY COMMUTE A LOT SAFER. I SHOULD DO THE CRITICAL MASS RIDE.

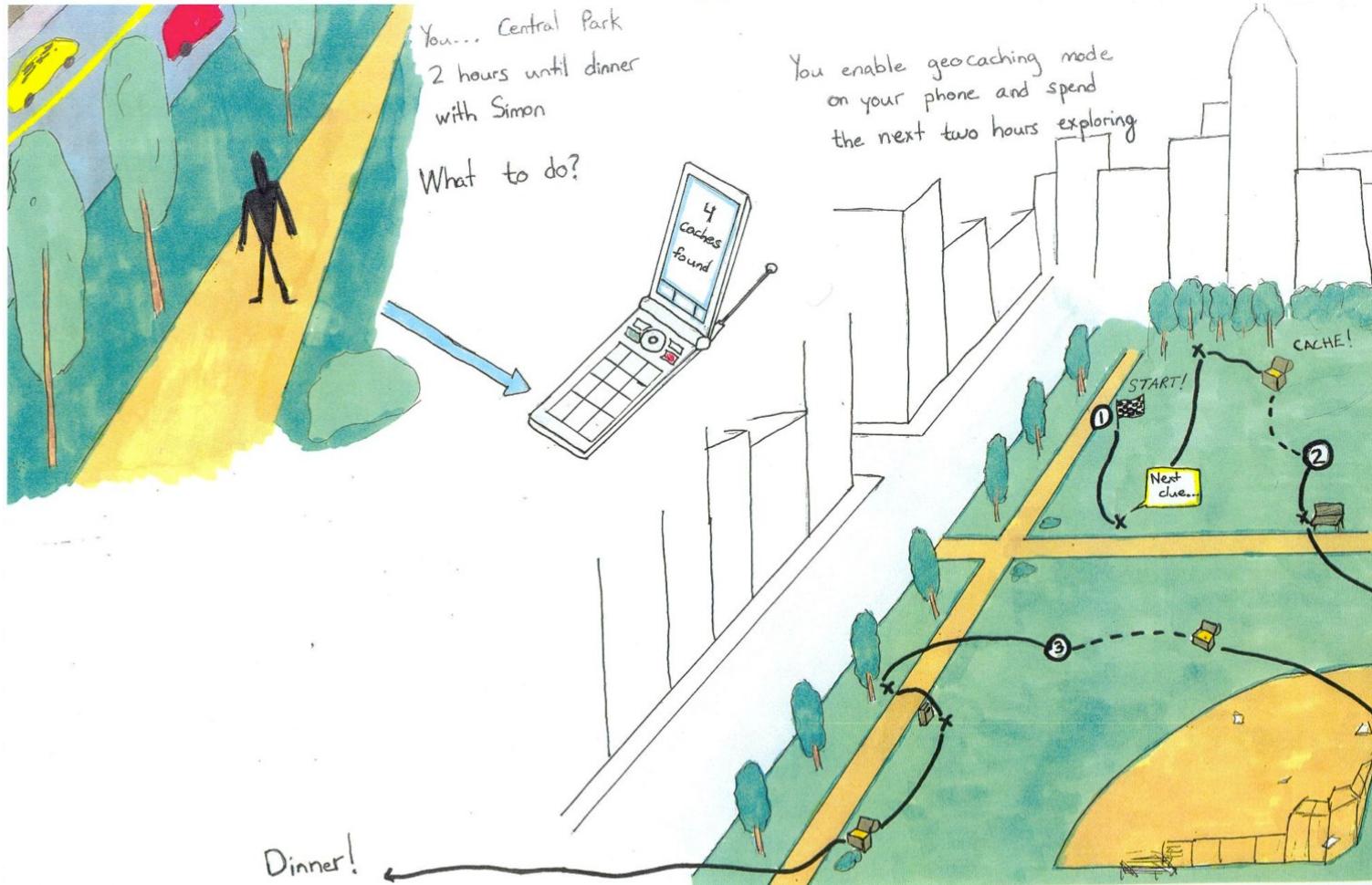


Field trial participants not only reported changing their behavior - reducing single occupant trips by around 10% - but they also told us about encouraging their peers and colleagues to do the same during and after the field trial.

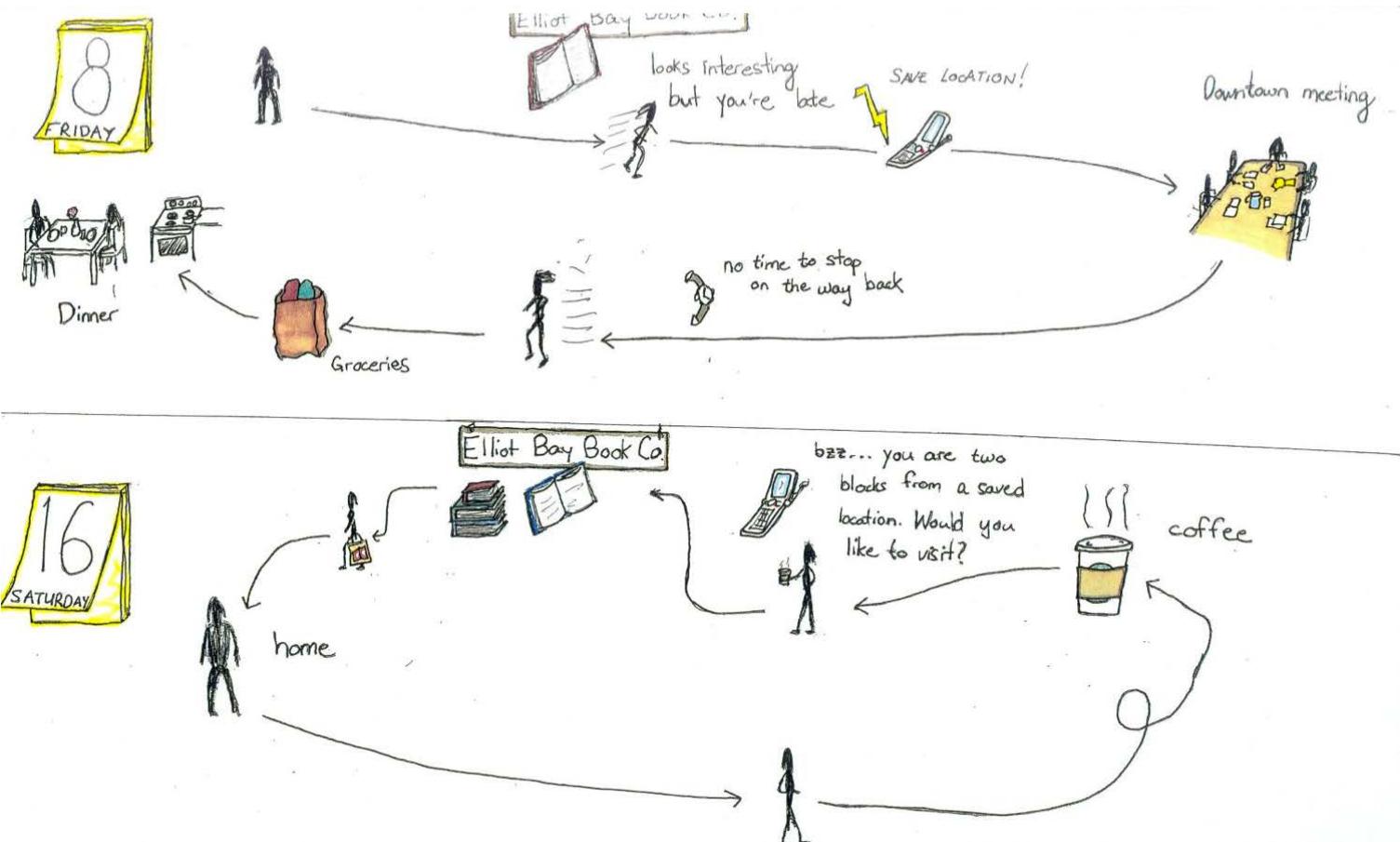
# Route Maps



# Route Maps



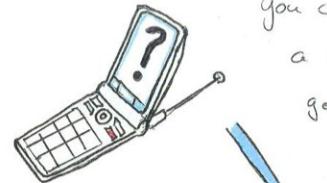
# Route Maps



# Route Maps



the movie is over and  
you are hungry, but you  
don't know the area...



you check your phone for  
a list of places people often  
go from here ...



... eventually settling on  
a diner and getting directions  
through your phone.



and discuss the  
food options with  
your friends ...

SM  
10/11/200

# Value of Animation or Video

Can illustrate critical timing

Can be more engaging than written or storyboard

Can more easily convey emotion (e.g., voice, music)

Can show interactive elements more clearly

Can be self-explanatory

If done well, can be an effective pitch

# Most Important Trick: Stop Motion



<http://courses.cs.washington.edu/courses/cse440/videos/videoprototyping/Mackay-StopAction.mp4>

# Most Important Trick: Stop Motion



<http://courses.cs.washington.edu/courses/cse440/videos/videoprototyping/Mackay-StopActionResult.mp4>

# Video Prototypes

May build upon paper prototypes,  
existing software, and images of real settings

Narration optional

Narrator explains, actors move or illustrate interaction

Actors perform movements and viewer  
expected to understand without voice-over

# Steps to Create a Video Prototype

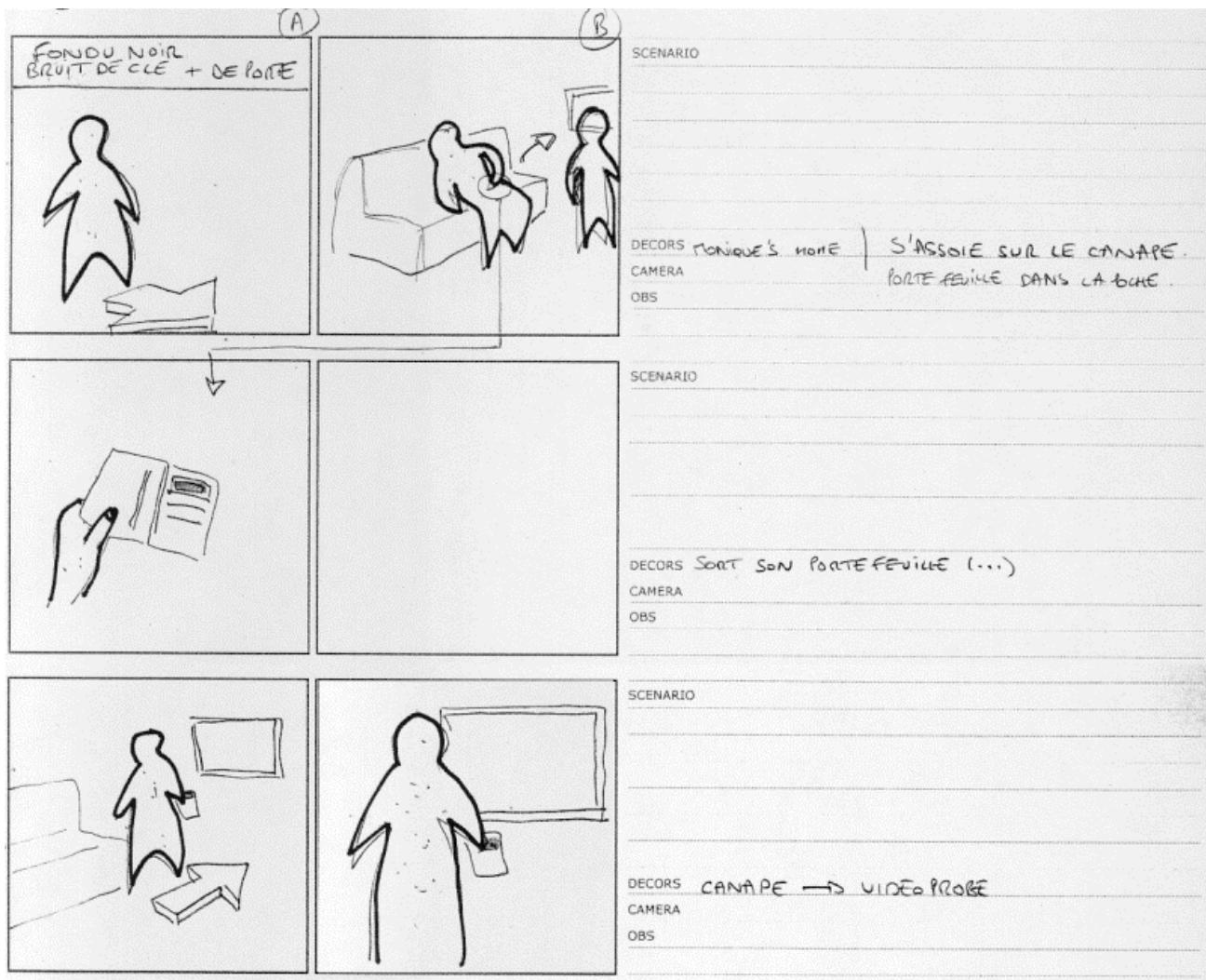
Review field data

Review ideas from brainstorm

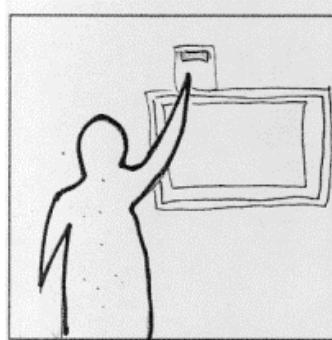
Create text for usage scenarios

Develop storyboard, with each scene on a card,  
illustrating each action/event with annotations  
explaining what is happening

# Steps to Create a Video Prototype

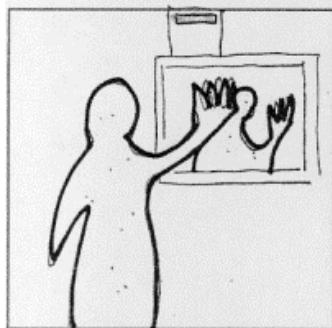


# Steps to Create a Video Prototype



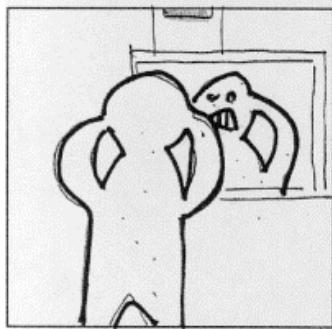
SCENARIO

DECORS FEED BACK ECRAN .  
CAMERA  
OBS



SCENARIO GRIMACE 1

DECORS  
CAMERA  
OBS VOIR BOUQUIN SHOOTER VUE DE FACE  
POUR INCUSTATION



SCENARIO

DECORS GRIMACE 2.  
CAMERA  
OBS

# Steps to Create a Video Prototype

Shoot a video clip for each storyboard card

Avoid editing in the camera, just shoot your scenes

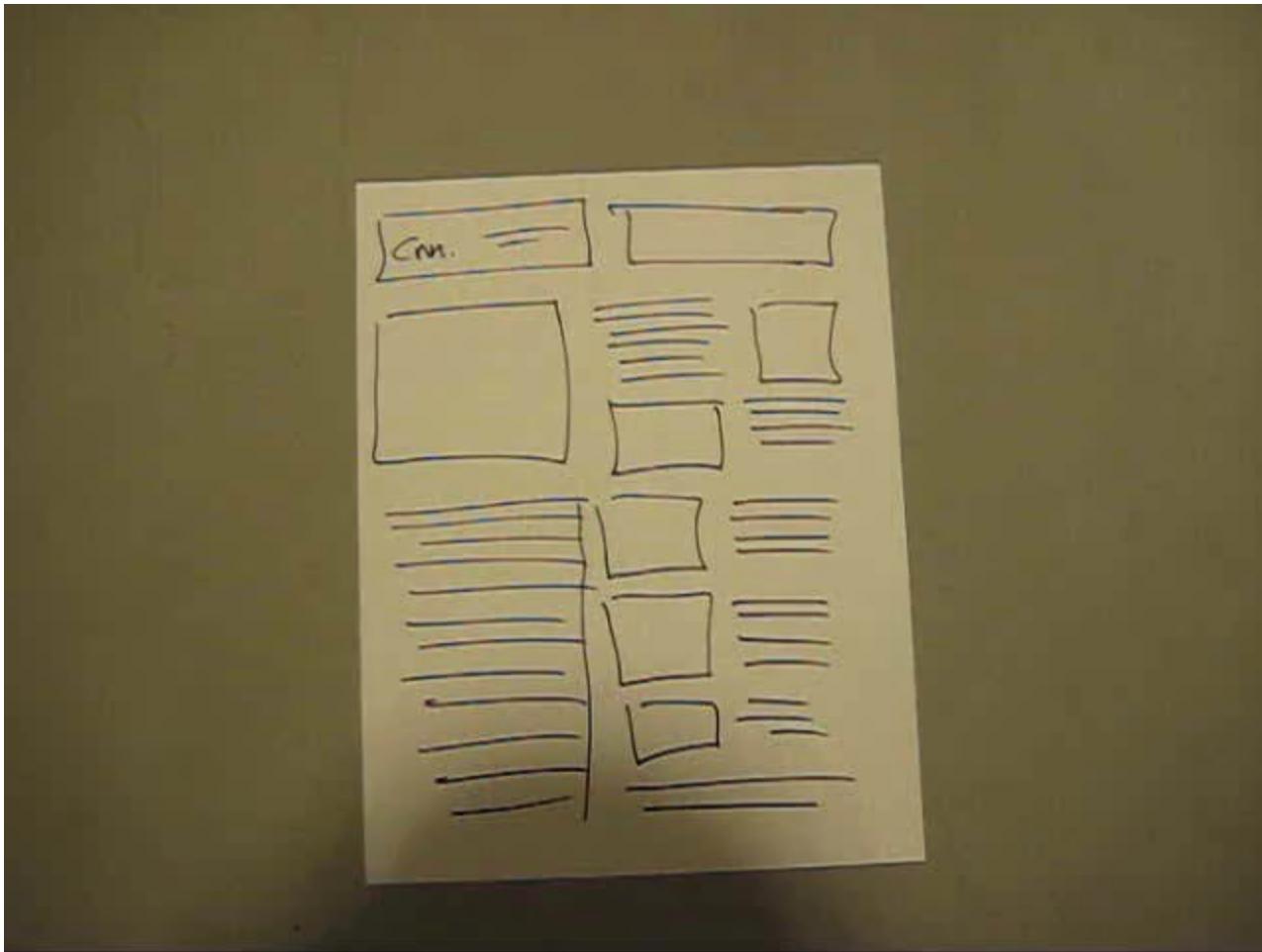
Use titles to separate clips

Like a silent movie

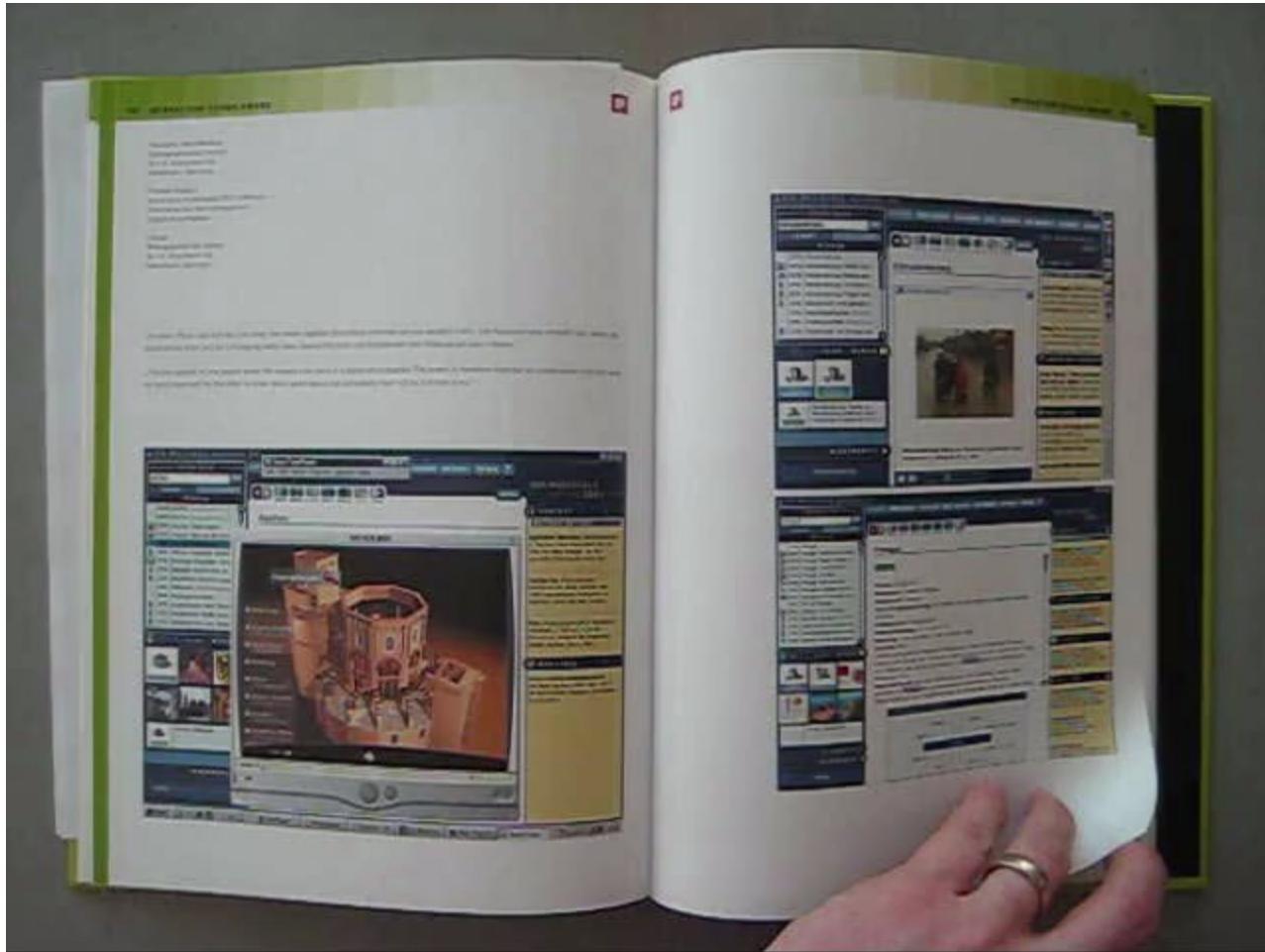
Digital changes these tradeoffs a little, but respect the spirit of doing this quickly to get point across

If you make an error, just reshoot it

# Prototyping Microsoft Surface



# Prototyping Microsoft Surface



<http://courses.cs.washington.edu/courses/cse440/videos/videoprototyping/Surface-Context-Lens.mp4>

# Lessons from Prior Video Prototypes

Narration, Pace, and Flair

Three versions of “Don’t Forget”

Using Projectors and Simple Props

“Buddy Map”

Watch for Pace and Scene Relevance

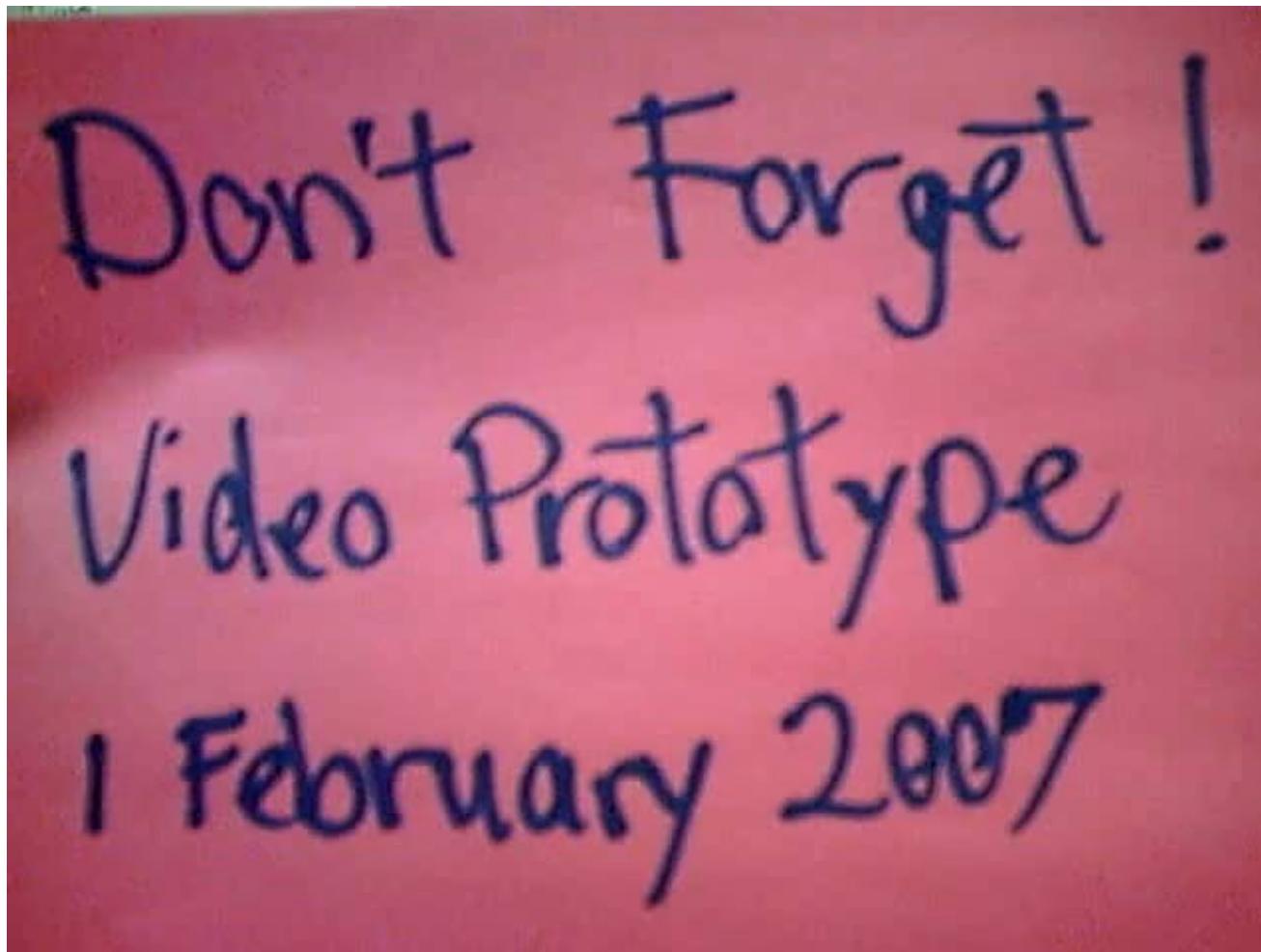
“Consumester”

# Narration, Pace, and Flair

**Don't Forget**

**by Carolyn Holmes and Fred Potter**

# Narration, Pace, and Flair



# Narration, Pace, and Flair

**"Don't Forget" Video Prototype  
Chris Govella - Peter Woodman**

<http://courses.cs.washington.edu/courses/cse440/videos/videoprototyping/Don't-Forget-3.mp4>

# Using Projectors and Simple Props

Team Buddy Map

# Backcountry Savior

Craig Panthen : Philip Kuo : Heidi Tanamulia : Christopher White  
CSE 440F : Professor Landay

# Watch for Pace and Scene Relevance

**Consumester**  
Video Prototype

# Lessons from Prior Video Prototypes

Split Presentation, Simple Effects

“PickUp”

Still-Frame, More Effects

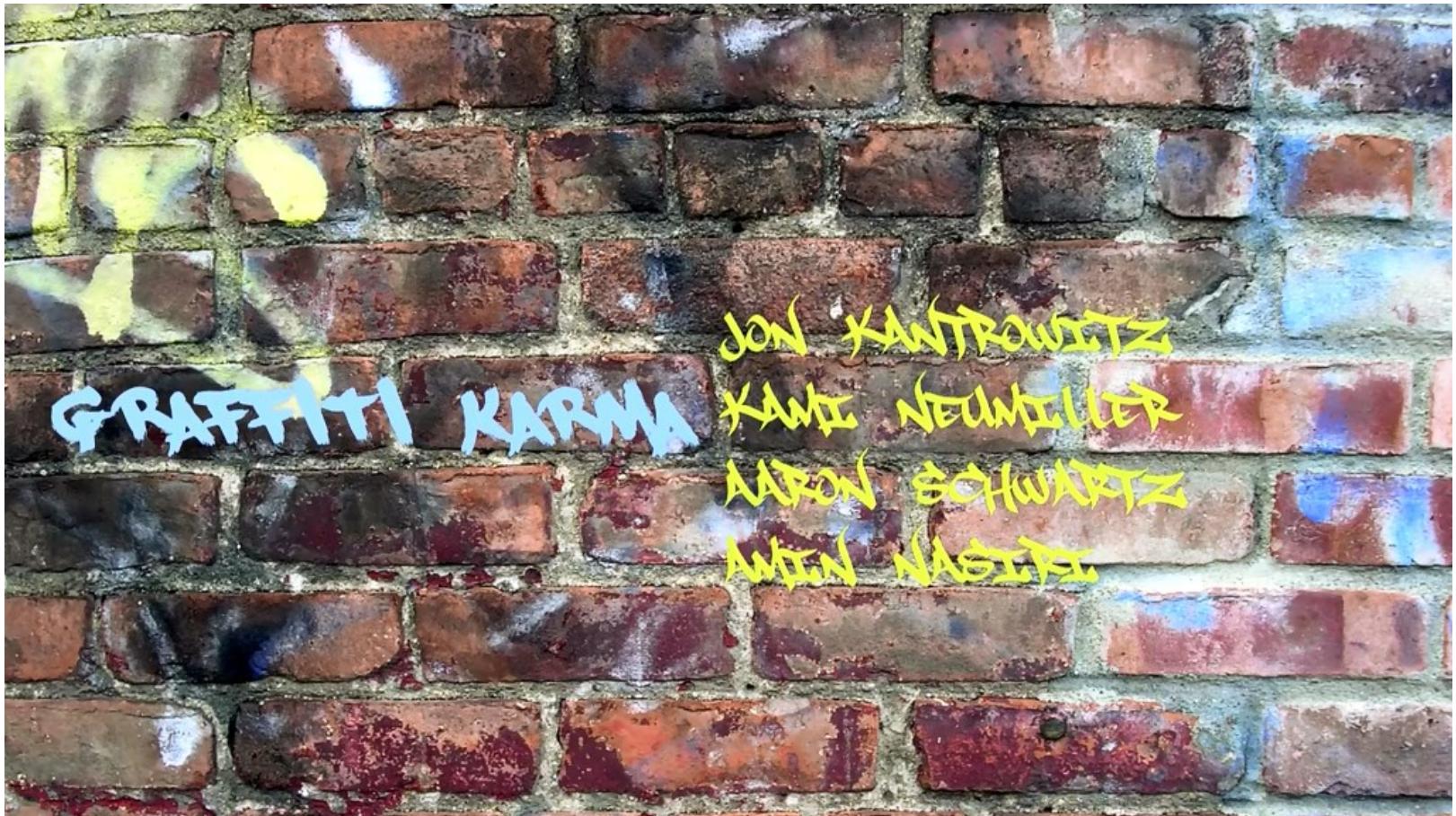
“Graffiti Karma”

# Split Presentation, Simple Effects



<http://courses.cs.washington.edu/courses/cse440/videos/videoprototyping/Pickup.mp4>

# Still-Frame, More Effects



# Lessons from Prior Video Prototypes

Scenario with a Contrast

“ParkSmart” (note that screens are static images)

Playful while Keeping Pace

“Plantr”

# Scenario with a Contrast



# Playful while Keeping Pace



# Range of Purposes

Illustrating Low-Level Techniques

Microsoft Surface examples convey timing

Illustrate Designs

Focus in this course

High-Level Visions

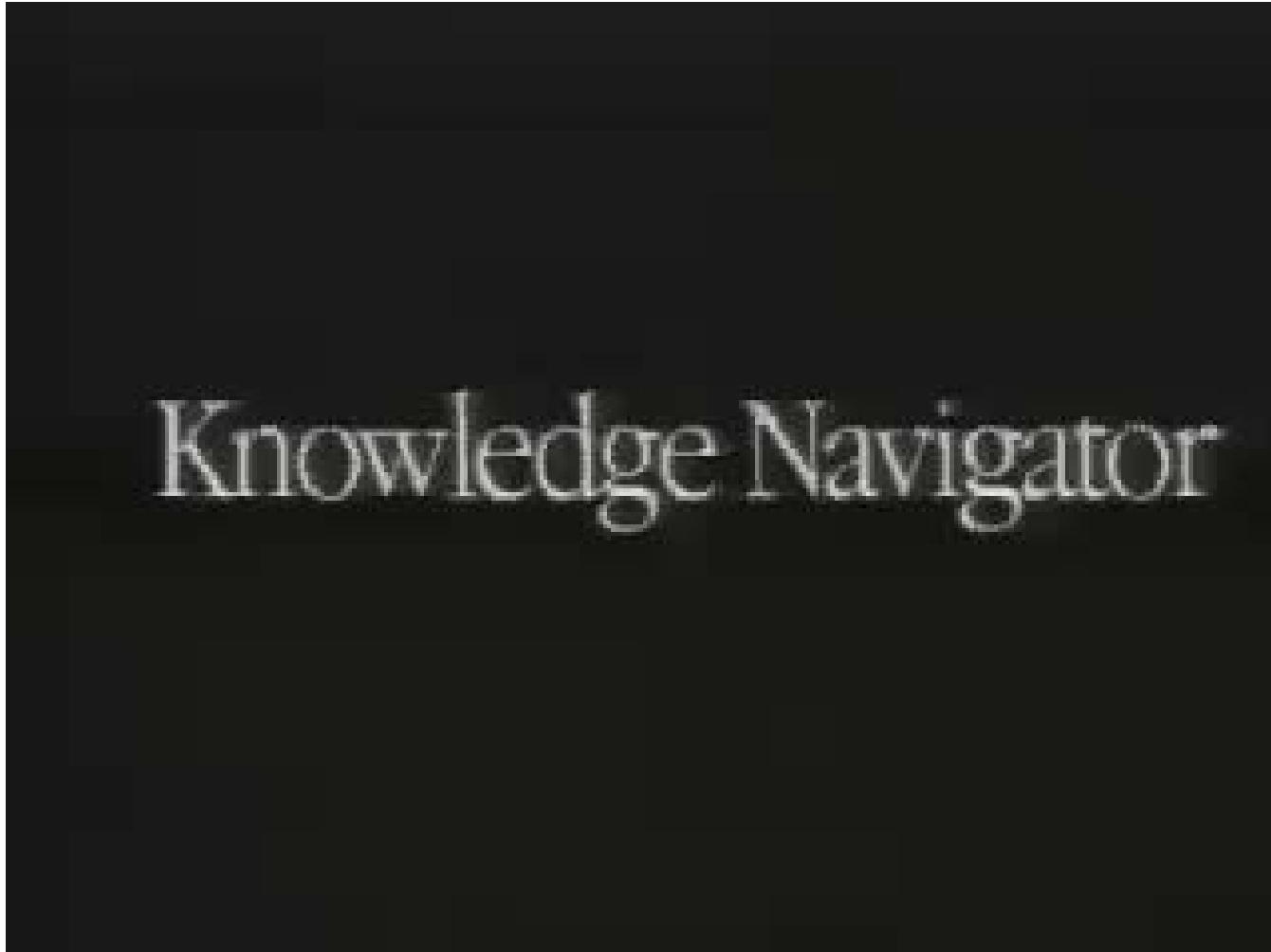
StarFire, Knowledge Navigator, A Day Made of Glass

# Sun's "Starfire" (1994)



<http://courses.cs.washington.edu/courses/cse440/videos/videoprototyping/Vision-Sun-Starfire.mp4>

# Apple's “Knowledge Navigator” (1987)



<http://courses.cs.washington.edu/courses/cse440/videos/videoprototyping/Vision-Apple-Knowledge-Navigator.mp4>

# Corning's "A Day Made of Glass" (2011)



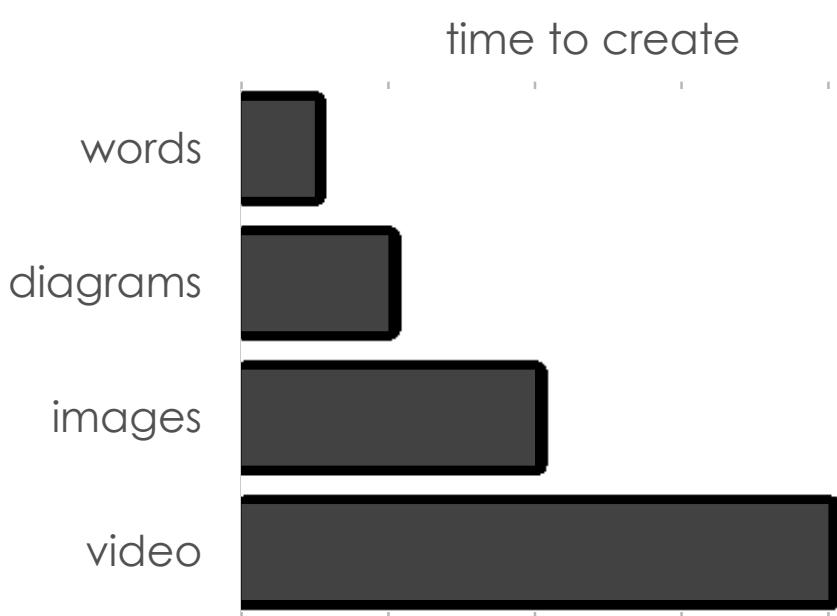
# LuciaMug Sketch: A Contrast



FLUIDUM

FLUIDUM

# Fidelity Takes Times: Stay Low Fidelity



If you need a video, do  
you really need footage?

If you need an animation,  
do you really need Flash?

If you need a photo, do  
you really need to shoot?

# Summary

Think about your audience

Think about your time constraints

Think about how much you want to tell

Think about options for presenting your story

# CSE 440: Introduction to HCI

## User Interface Design, Prototyping, and Evaluation

Lecture 08:  
Storyboarding

James Fogarty  
Daniel Epstein  
Brad Jacobson  
King Xia

Tuesday/Thursday  
10:30 to 11:50  
MOR 234

