

Introduction to HCI

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Prototyping

Medium and High Fidelity

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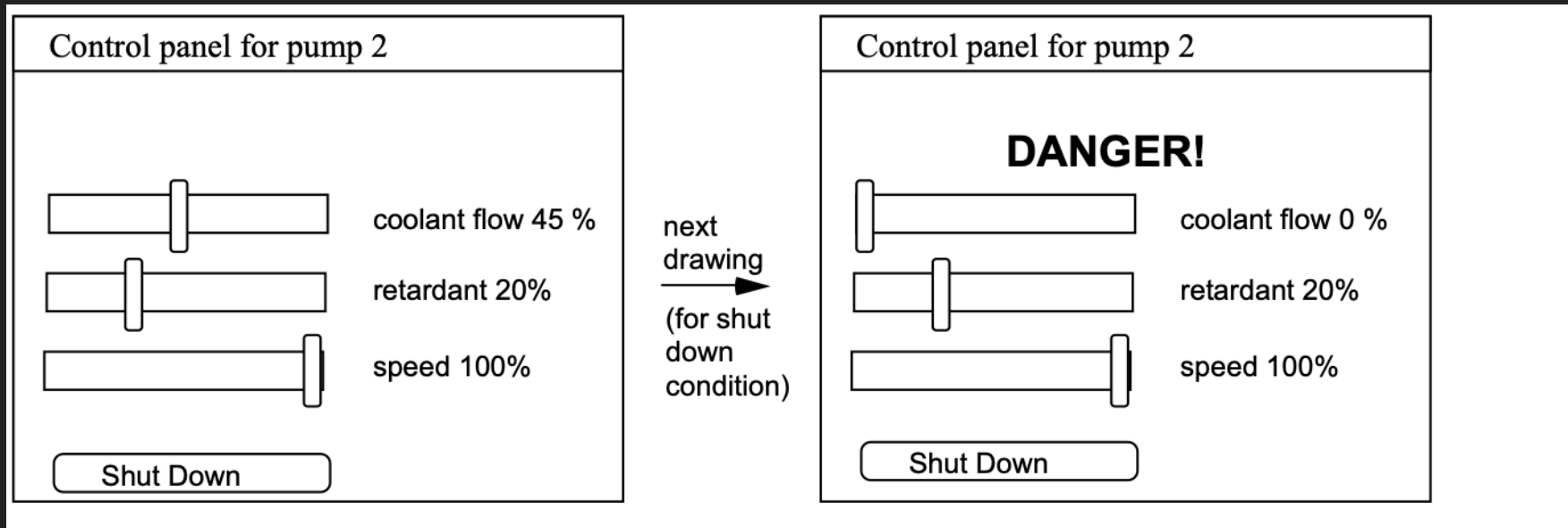
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Learning Goals

- ▶ Explain how dimensions of fidelity might differ in low to med to high fidelity prototypes, and give examples of when/why you may use each type
- ▶ Make strategic choices about prototyping tools given your goals and constraints; be able to justify your choice

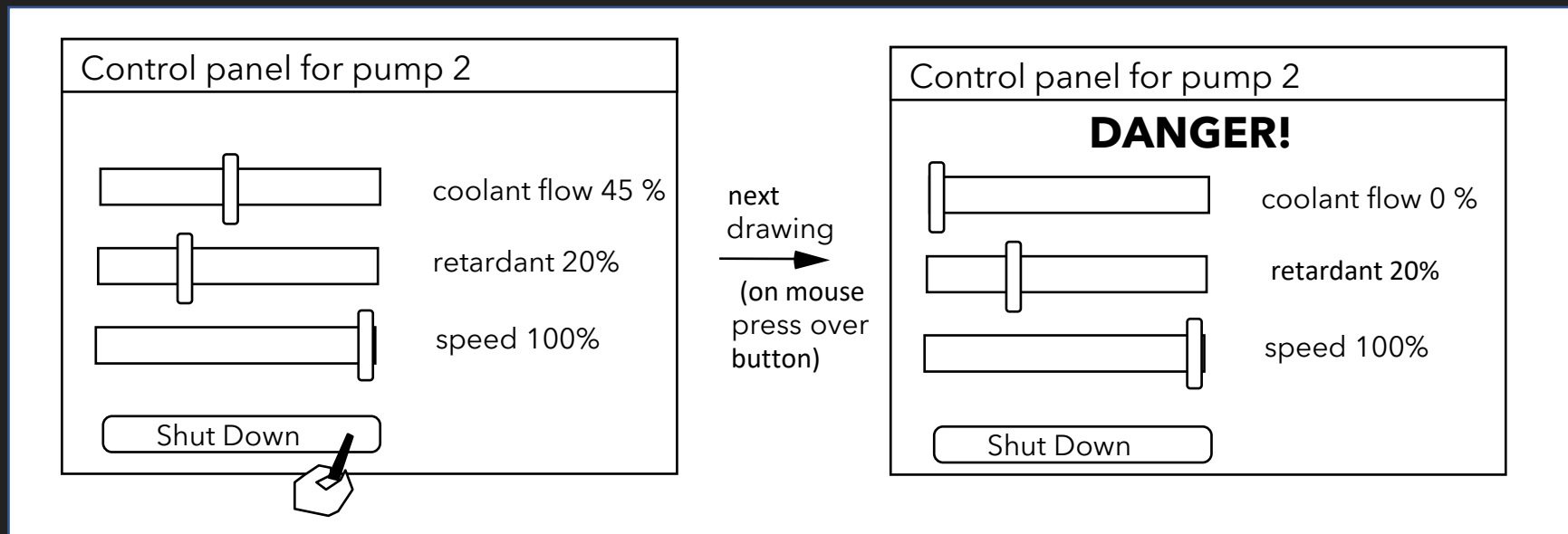
Technique: digital storyboards

- ▶ Draw each storyboard scene on computer
 - ▶ Use wire framing/mockup software (e.g., Balsamiq)
 - ▶ Or painting/drawing packages (e.g., Photoshop)
- ▶ A very thin horizontal prototype
 - ▶ Does not capture the interaction “feel”



Technique: scripted simulations & slide shows

- ▶ Encode the storyboard on the computer
 - ▶ Scene transition activated by simple user inputs (i.e., Clickable regions)
 - ▶ A simple horizontal and/or vertical prototype
 - ▶ Supports 'limited' branching
- ▶ User given a very tight script/task to follow
 - ▶ Appears to behave as a real system



Medium-fidelity prototypes

- ▶ Prototyping with a computer
- ▶ Engaging for end users
- ▶ Simulate some but not all features of the interface (interactive)
- ▶ Can test more subtle design issues

- ▶ Pitfalls
 - ▶ Blinds people to major representational flaws because of a tendency to focus on more minor details
 - ▶ Users reluctant to change/challenge designer
 - ▶ Management may think its real!

What's the difference between "low" and "medium" ?

- ▶ Used to be obvious! Paper vs. Nearly anything else.
- ▶ In last ~10 years: many powerful tools that:
 - ▶ Make it very easy (a low-fi trait) to generate mockups
 - ▶ Look real and are at least somewhat interactive (usually a "medium fidelity" trait)
- ▶ e.g.: Balsamiq, Axure, Figma - low or medium; usually not high

Many dimensions of "fidelity"

- ▶ What are ways a prototype can be 'true to life'?
 - ▶ Visual realism: how real it looks. Polish, graphic imagery
 - ▶ Physical realism: shape and form for 3D objects; feel
 - ▶ Scope: how many functions included; horizontal vs vertical
 - ▶ Functionality: what actually works? e.g., Web app: live links
 - ▶ Data: operates on real vs faked data
 - ▶ Autonomy: operates alone vs requires "supervision"
 - ▶ Platform: interim vs final implementation

Important lessons:

- ▶ It is COMPLICATED (slow, expensive) to prototype multiple dimensions at once
 - ▶ So don't. Instead: use modularity of prototyping
- ▶ Each prototyping tool has strengths and weaknesses
 - ▶ May be better (more efficient and capable) for some of these prototyping dimensions than others
 - ▶ You may need multiple tools throughout your design's life cycle

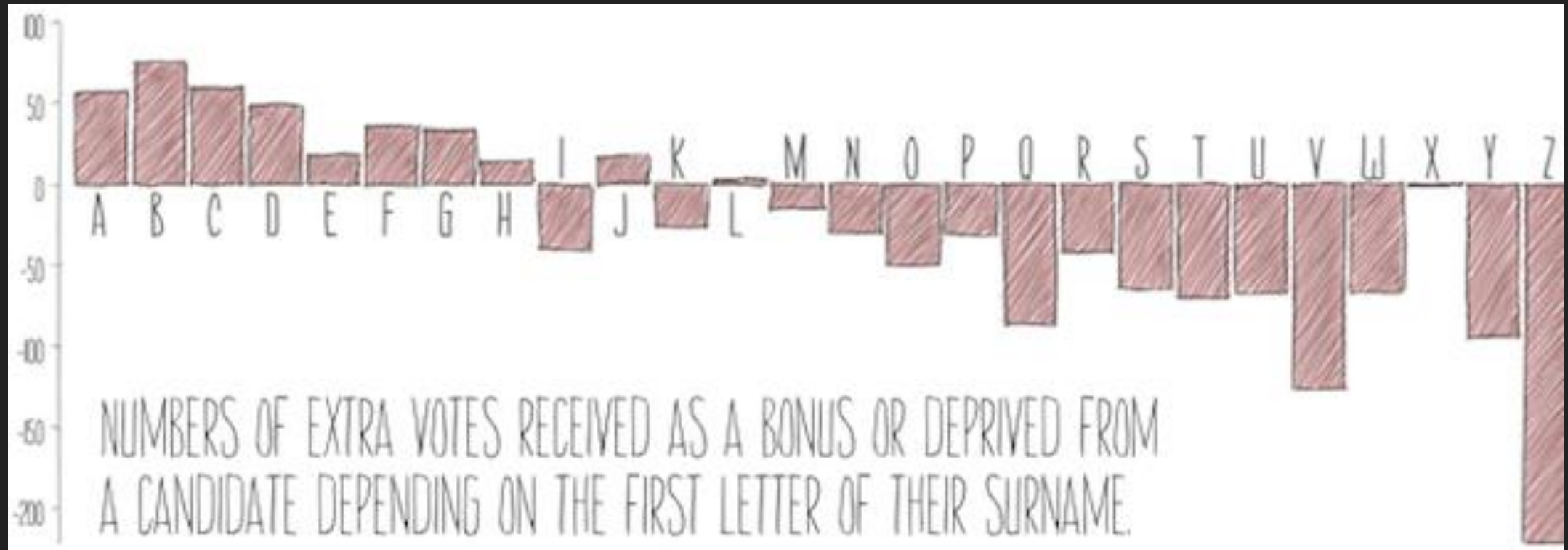
A competitive analysis of prototyping tools

Prototyping Tools Compared						
	Invision	Flinto	Principle	Proto.io	Origami Studio	Framer
Sketch Import & Sync	✓	✓	✓	✓		✓
Screen Transitions	✓	✓	✓	✓	✓	✓
Micro Interactions			✓	✓	✓	✓
Collaboration Tools	✓			✓		
Preview on iOS		✓	✓	✓	✓	✓
Preview on Android				✓	✓	✓
Share on iOS	✓	✓	✓	✓	✓	✓
Share on Android	✓			✓	✓	✓
Low Learning Curve	✓	✓	✓	✓		
User Testing Tools	✓			✓		
Device Integrations					✓	✓

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<https://www.aalpha.net/blog/best-prototyping-tools-for-ux-design/>

You can make medium-fidelity mockups look low-fi



This graphic is generated from code (processing)

<http://www.gicentre.org/handy/>

Balsamiq: low to medium



Quickly mock up images and hyperlinked interactivity. But - real functionality is difficult.

Difference between med to high-fidelity prototypes

- ▶ Increasing in completeness and detail:
 - ▶ More aspects being prototyped at same time
 - ▶ Higher degree of functionality
 - ▶ Higher degree of polish

Fidelity is a spectrum

- ▶ Not always a firm line between low/med or med/hi

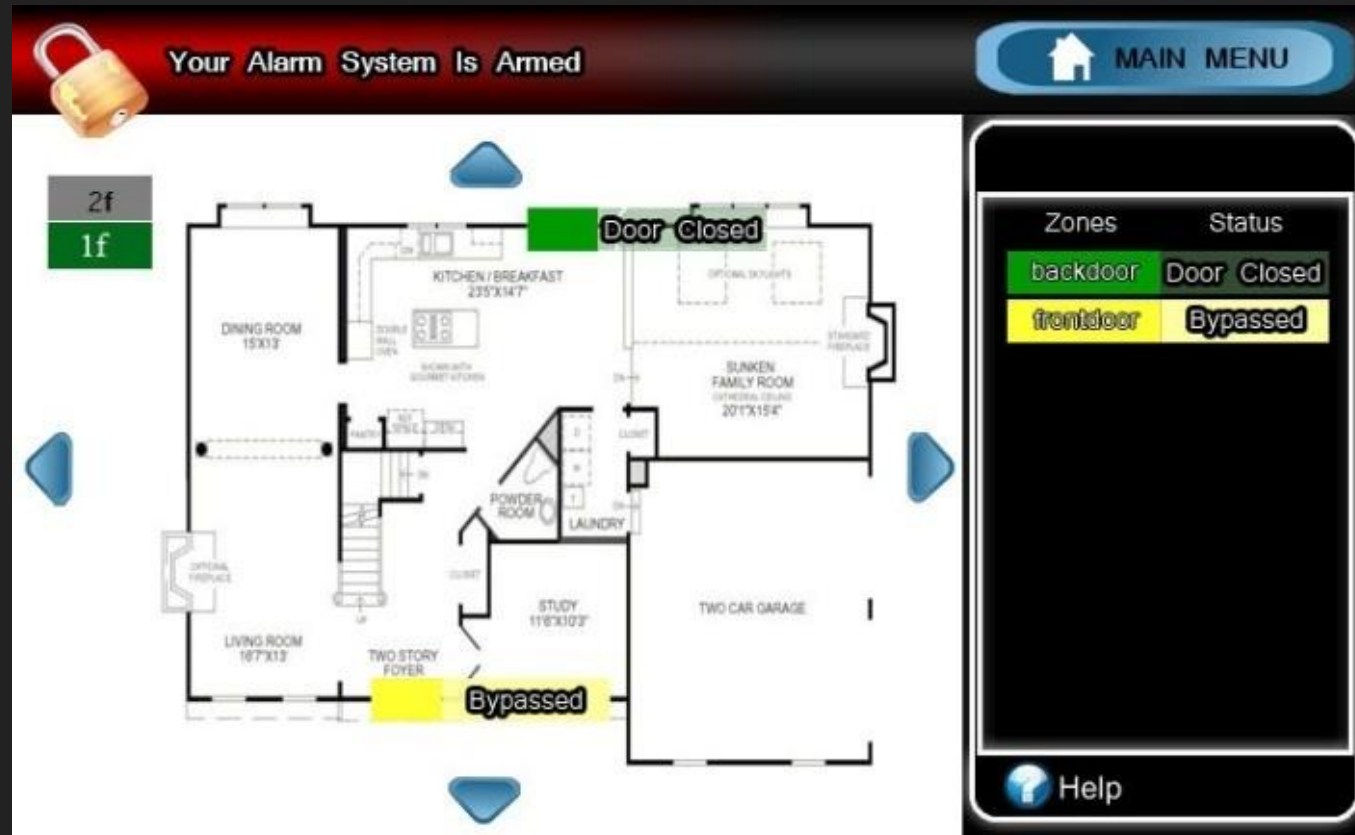
Medium and high-fidelity prototyping: what can you use?

- ▶ Drag-and-drop GUI toolkits for standard UI mockups
 - ▶ e.g., Axure, visual basic
- ▶ Scripting languages & interface libraries
 - ▶ e.g., Python, tcl/tk, java script libraries (e.g., JQuery)
- ▶ Graphical languages for visualization & novel interface creation
 - ▶ VB, java, flash; processing; D3
- ▶ Special purpose tools and environments
 - ▶ e.g., Toolkits for integrating speech, haptics, I/O devices
- ▶ A prototyping platform can be medium- or hi-fi; depends on how you use it.

Prototyping vs. Development

- ▶ For simple prototyping
 - ▶ Balsamiq, axure, html, powerpoint
- ▶ More advanced features in e.g., Supercard, director:
 - ▶ Text-to-speech, speech recognition, quicktime, filmstrips, graphic import and export, MP3 playback etc.
- ▶ Advanced UIs still require (scripting) language + libraries
 - ▶ HTML + javascript
 - ▶ Tool command language/tool kit (TCL/TK)
 - ▶ Python
 - ▶ Processing (java based, but way more accessible; good for sketching, no good for larger code projects)
 - ▶ Still a need for C++, C#, objective C, java

Home alarm system



Flash:

- ▶ Product for the home
- ▶ Needed to gauge reactions to having it in one's house
- ▶ Imagery + graphic resolution critical

E-reader & note-taking tool

File Chooser

Back to Regular M...

Hybrid View

<Lecture Note>

Recording: FILENAME_HERE.mp3: 0/420

CourseFour

CourseThree

CourseTwo

CourseOne

Textbook1

Textbook2

Recording

File Sharing

Settings

Help

Hybrid View:
Split views for displaying two files simultaneously.

References: Can make hyperlink references between content

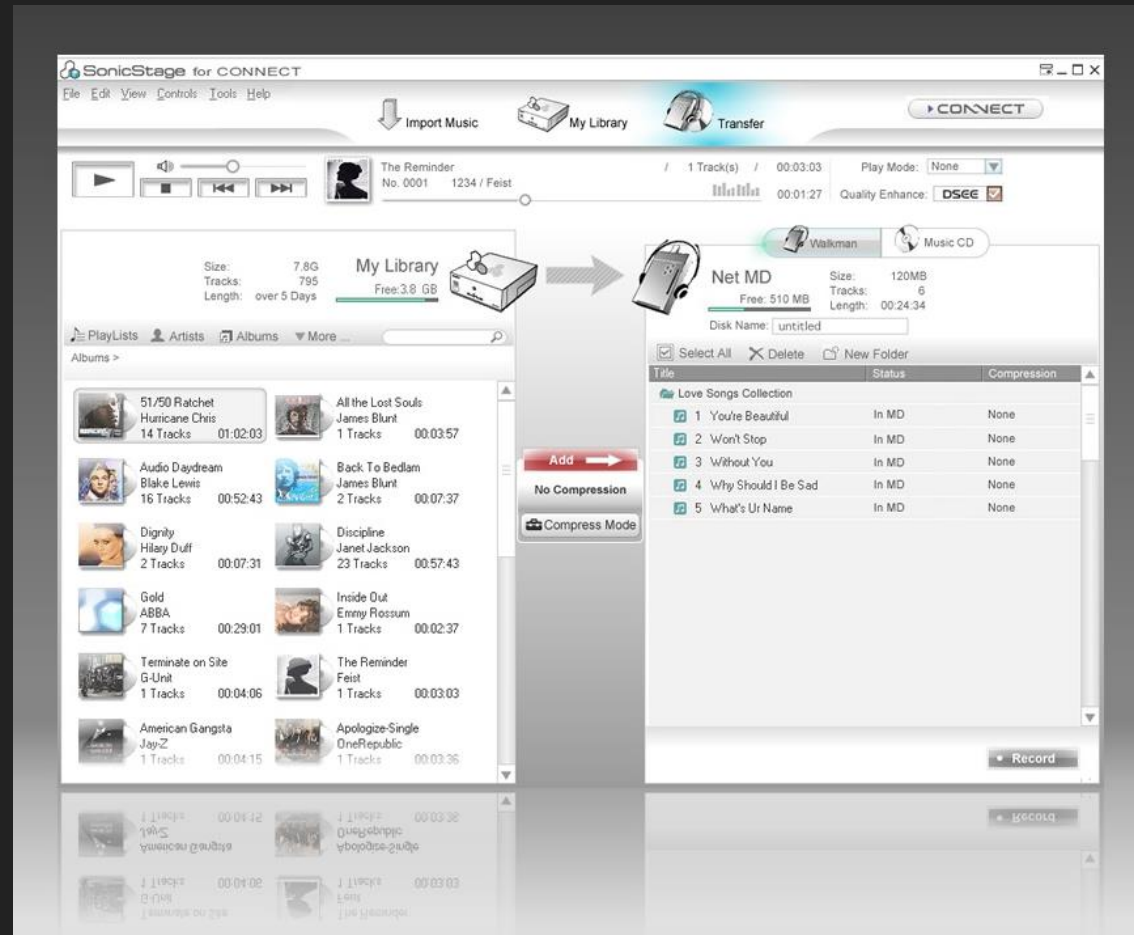
All controls are preserved

Flex:

needed to test how well the concept worked for actually taking notes in lecture

highly functional
detailed vertical

Sonic stage music synchronization tool



Flash w/
imported
photoshop

observe
scanned,
hand-drawn
sketches

How do you know when you have - or need - a high-fi prototype?

- ▶ Scope is complete (horizontal and vertical)
 - ▶ Prototype can be tested in just about every way performance as well as subjective and cognitive analysis; more realistic scenarios; in field
 - ▶ Feels like its time to switch to final development platform
 - ▶ Design is becoming rigid and finalized

Work in class

- ▶ Work in groups
- ▶ Discuss and identify
 - ▶ Think about the next steps of your design
 - ▶ What platforms are you choosing and why?
 - ▶ What challenges do you anticipate when moving from your low-fidelity prototypes to the next steps?

Additional Information

Rapid Prototyping: Digital | Google for Startups



<https://www.youtube.com/watch?v=KWGBGTGryFk>

Summary: Low fidelity vs. High fidelity

- ▶ cheap
- ▶ easy to build lots
- ▶ facilitate communication
- ▶ gross design (layout)
- ▶ market requirements
- ▶ proof-of-concept
- ▶ limited error checking
- ▶ hard to get to code
- ▶ facilitator driven
- ▶ limited functionality
- ▶ complete functionality
- ▶ interactive
- ▶ user-driven
- ▶ exploration and testing
- ▶ look and feel of final product
- ▶ provides specification
- ▶ marketing and sales tool
- ▶ expensive
- ▶ time consuming
- ▶ inefficient proof-of-concept
- ▶ poor for requirements gathering
- ▶ can be hard to throw away

Tools available to you

- ▶ Balsamiq
- ▶ Axure
- ▶ Figma
- ▶ The Adobe Suite, Photoshop, InDesign, Illustrator, Premiere, and Dreamweaver
Microsoft Office suite (PPT can be useful).
- ▶ Note that many tools have 30-day free trials

Matching game: What medium makes most sense for each dimension?

- ▶ Prototyping dimension:
- ▶ How real it looks (polish)
- ▶ Scope how many functions included; horizontal vs vertical
- ▶ Real vs faked functionality how much of it is faked?
- ▶ Operates on real vs faked data
- ▶ Operates alone vs requires "supervision"
- ▶ For 3D products: physical aspects, or just images?
- ▶ Interim vs final platform

Useful Links:

<https://www.creativebloq.com/advice/the-8-best-prototyping-tools-for-2018>

<https://kfginternational.com/blog/top-prototype-ux-ui-tools/>

<http://www.nexgendesign.com/top-7-prototyping-mockup-tools>

- ▶ Prototyping medium:
- ▶ Paper
- ▶ Balsamiq
- ▶ Axure
- ▶ Invision
- ▶ Proto.io
- ▶ Flinto
- ▶ Powerpoint
- ▶ Html (or dreamweaver)
- ▶ Java/swing
- ▶ Processing
- ▶ Modeling foam & hot-melt glue
- ▶ Flash
- ▶ Visual basic
- ▶ Photoshop
- ▶ Arduino
- ▶ Found objects
- ▶ Tcl/tk
- ▶ Python
- ▶ Pop

Optional reading

- ▶ Getting the right design and the design right: Testing Many Is Better Than One
 - ▶ <https://drive.google.com/file/d/1OfJh1RSu8M5HuqFww3hIK8TnXB109h4y/view?usp=sharing>