

CS377E: ENGELBART'S UNFINISHED LEGACY: DESIGNING SOLUTIONS TO GLOBAL GRAND CHALLENGES

Early Stage Prototyping

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Outline

- Storyboarding
- Types of Prototypes
- Low-fi prototyping

Design Process: Exploration

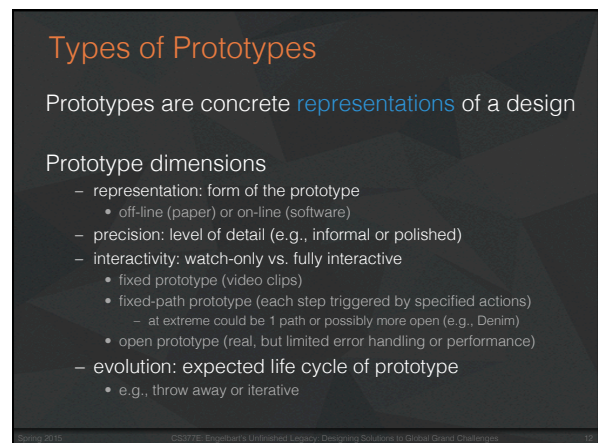
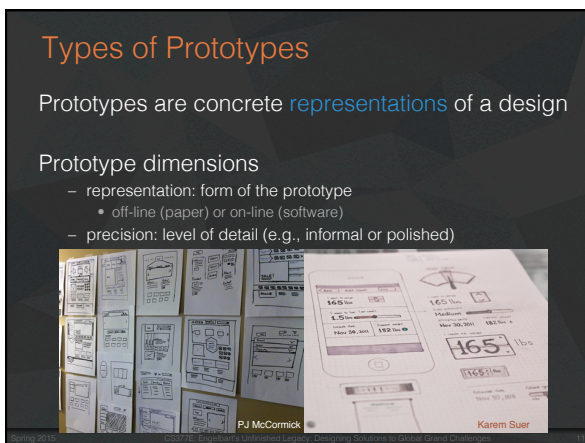
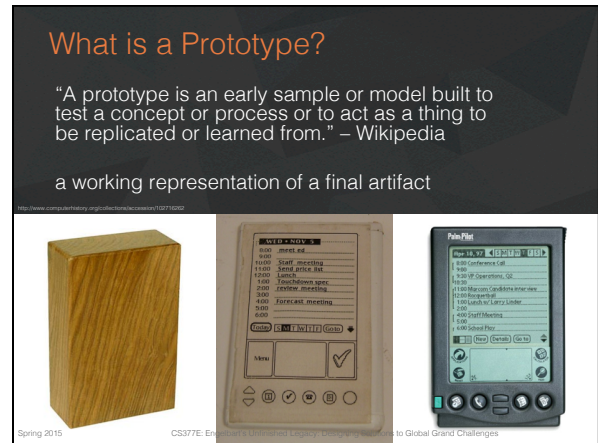
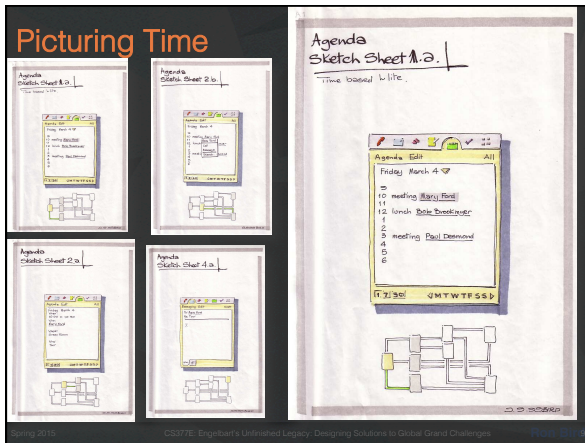
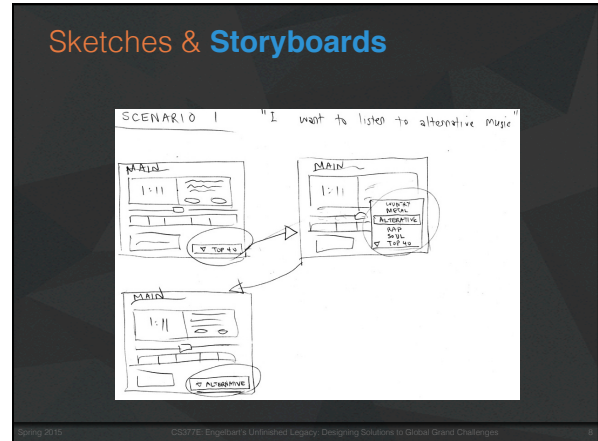
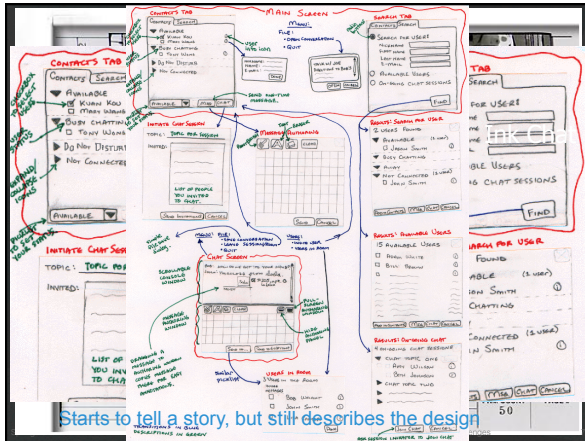
Expand Design Space

- Brainstorming
- Sketching
- Storyboarding
- Prototyping

Sketches & Storyboards

- Where do storyboards come from?
 - film & animation
- Give you a “script” of important events
 - leave out the details
 - concentrate on the important interactions

Sketches & Storyboards



Fidelity in Prototyping

- Fidelity refers to the level of detail
- High fidelity?
 - prototypes look like the final product
- Low fidelity?
 - artists renditions with many details missing



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Hi-fi Prototypes Warp

- Perceptions of the tester/reviewer
 - representation communicates “finished”
 - comments focus on color, fonts, & alignment
- Time
 - encourage precision
 - specifying details takes more time
- Creativity
 - lose track of the big picture



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Why Use Low-fi Prototypes?

- Traditional methods take too long
 - sketches → prototype → evaluate → iterate
- Can instead *simulate* the prototype
 - sketches → evaluate → iterate
 - sketches act as prototypes
 - designer “plays computer”; others observe & record
- Kindergarten implementation skills
 - allows non-programmers to participate



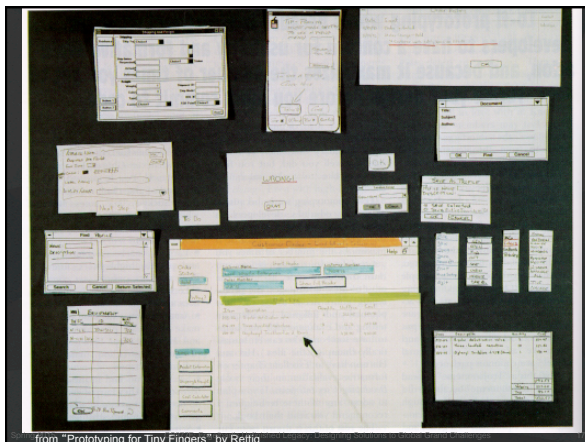
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The Basic Materials

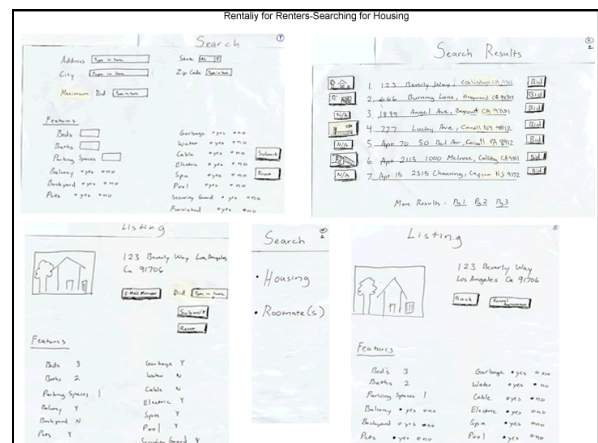
- Large, heavy, white paper (A3 or 11x17)
- 5x8 in./A5/A6 index cards
- Tape, stick glue, correction tape
- Pens & markers (many colors & sizes)
- Post-its
- Overhead transparencies
- Scissors
- X-acto knives, etc.

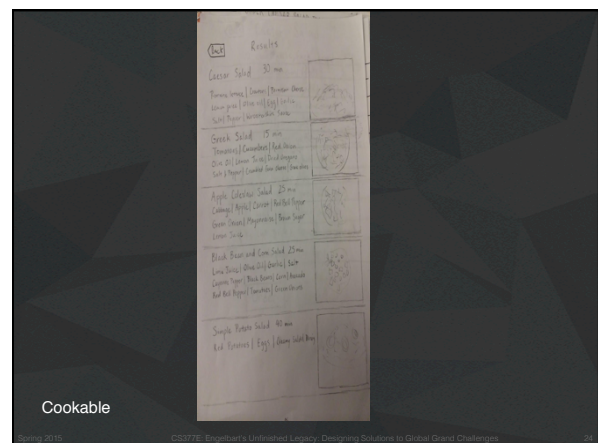
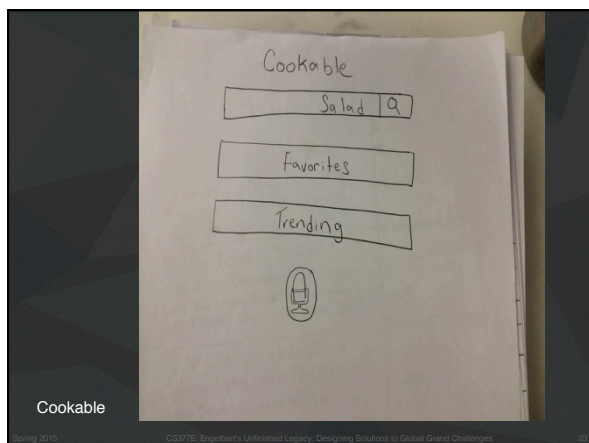
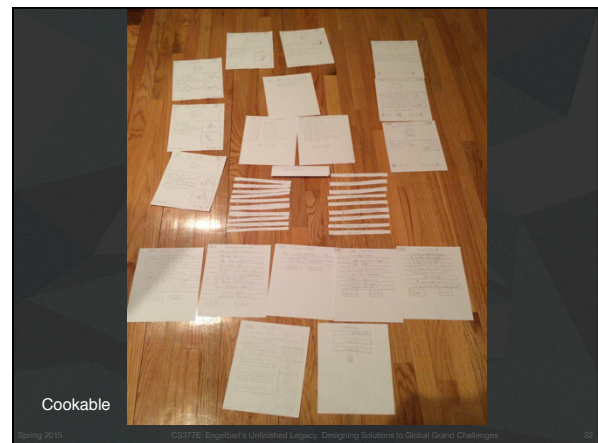
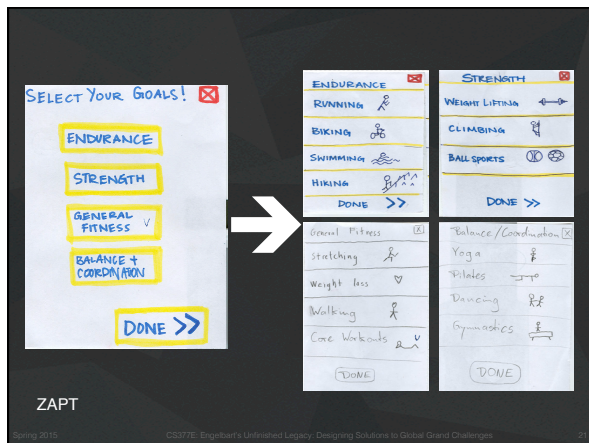
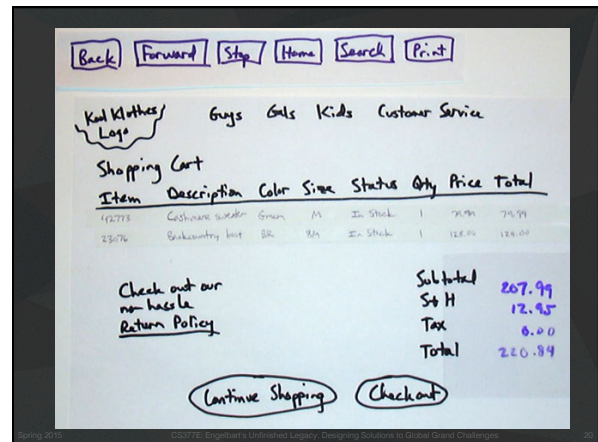
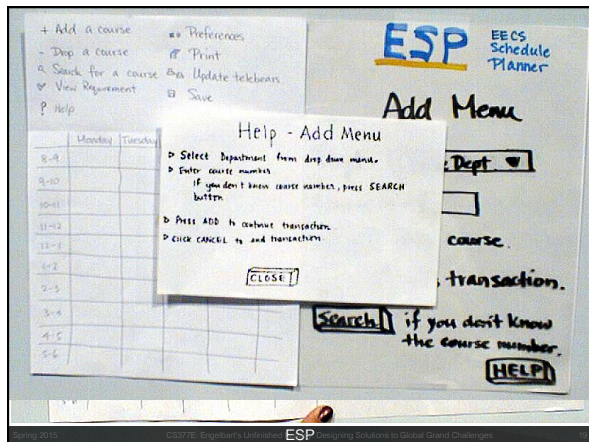


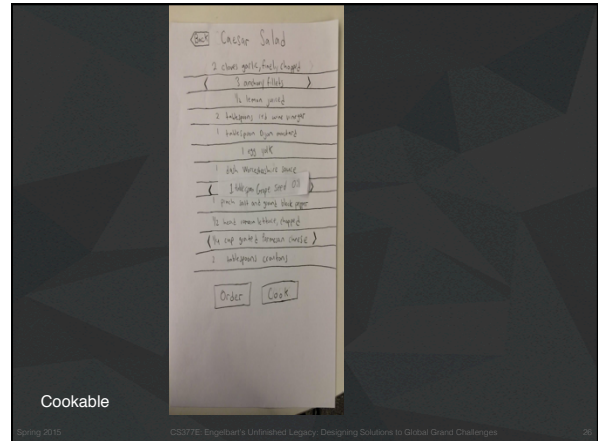
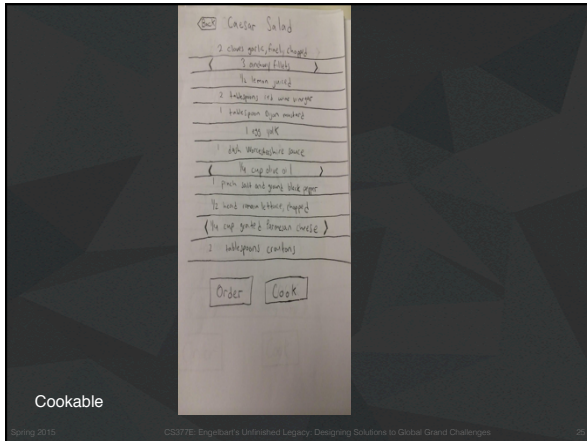
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from “Prototyping for Tiny Fingers” by Rettig

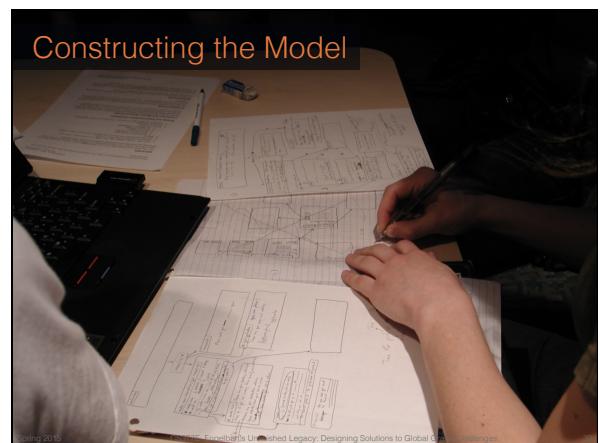
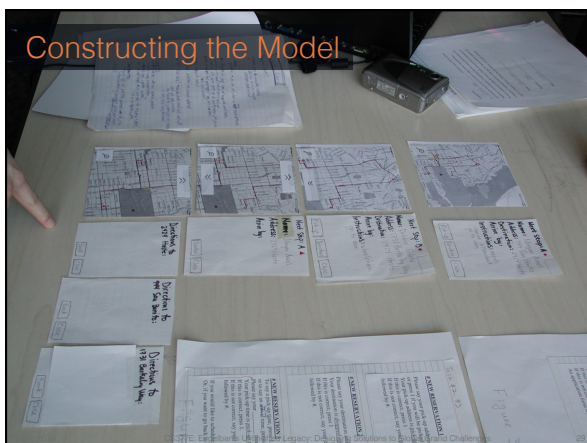
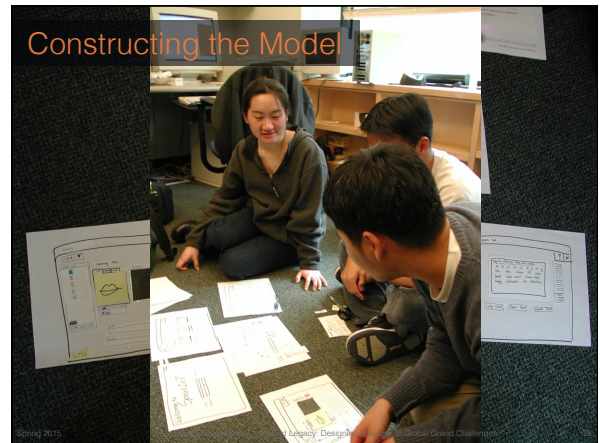


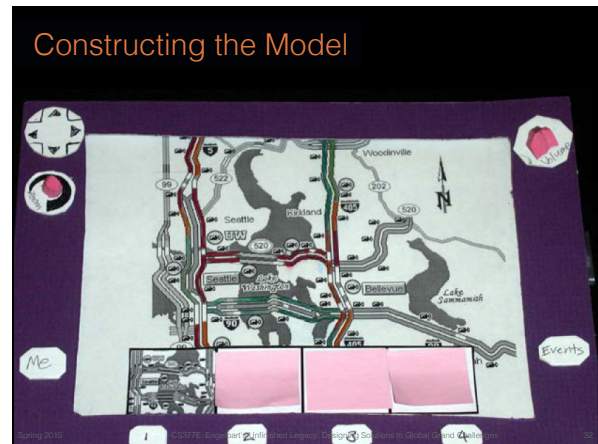
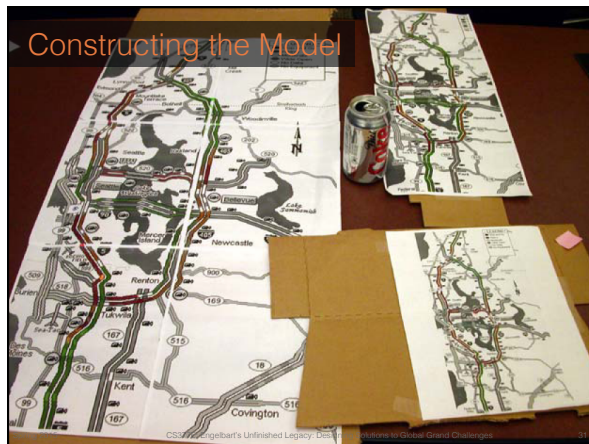




Constructing the Model

- Set a deadline
 - don't think too long - **build it!**
- Draw a window frame on large paper
- Put different screen regions on cards
 - anything that moves, changes, appears/disappears
- Ready response for any user action
 - e.g., have those pull-down menus already made
- Use photocopier/printer to make many versions





Preparing for a Test

- Select your “customers”
 - understand background of intended users
 - use a questionnaire to get the people you need
 - don’t use friends or family
 - I think existing “customers” are OK (Rettig disagrees)
- Prepare scenarios that are
 - typical of the product during actual use
 - make prototype support these (small, yet broad)
- Practice to avoid “bugs”

Conducting a Test

- Four roles
 - greeter – puts users at ease & gets data
 - facilitator – only team member who speaks
 - gives instructions & encourages thoughts, opinions
 - computer – knows application logic & controls it
 - always simulates the response, w/o explanation
 - observers – take notes & recommendations



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- Typical session is 1 hour
 - preparation, the test, debriefing
- Read the Gommel paper (1 page) for details on conducting a test

Evaluating Results

- Sort & prioritize observations
 - what was important?
 - lots of problems in the same area?
- Create a written report on findings
 - gives agenda for meeting on design changes
- Make changes & iterate

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Advantages of Low-fi Prototyping

- Takes only a few hours
 - no expensive equipment needed
- Can test multiple alternatives
 - fast iterations
 - number of iterations is tied to final quality
- Almost all interaction can be faked

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Wizard of Oz Technique

- Faking the interaction. Comes from?
 - the film “The Wizard of Oz”
 - “the man behind the curtain”
- Long tradition in computer industry
 - e.g., prototype of a PC w/ a DEC VAX behind the curtain



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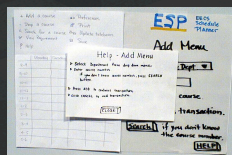
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 - e.g., prototype of a PC w/ a DEC VAX behind the curtain
- Much more important for hard to implement features
 - speech & handwriting recognition

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Problems with Low-fi Prototypes

- “Computer” inherently buggy
- Slow compared to real app
 - timings not accurate
- Hard to implement some functionality
 - pull-downs, feedback, drag, viz ...
- Won't look like final product
 - sometimes hard to recognize widgets
- End-users can't use by themselves
 - not in context of user's work environment



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Summary

- Prototypes are a concrete representation of a design or final product
- Low-fi testing allows us to quickly iterate
 - get feedback from users & change right away

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Further Reading Prototyping

- Books
 - [Paper Prototyping: The Fast and Easy Way to Design and Refine User Interfaces](#), by Carolyn Snyder, Morgan Kaufmann, 2003
- Articles
 - [“Prototyping for Tiny Fingers”](#) by Marc Rettig, in *Communications of the ACM*, 1994
 - [“Using Paper Prototypes to Manage Risk”](#) by Carolyn Snyder, <http://world.std.com/~uieweb/paper.htm>
 - [“The Perils of Prototyping”](#) by Alan Cooper, <http://www.chi-sa.org.za/Documents/articles/perils.htm>

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Next Time

- Project
 - work on defining project idea, tasks, and low-fi prototype in class
 - build & test low-fi prototypes for next Tuesday's class

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