



Human-Computer Interaction Design Studio

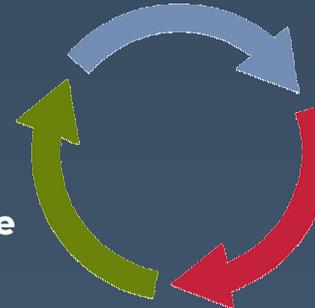
5 February 2013

<http://cs247.stanford.edu>

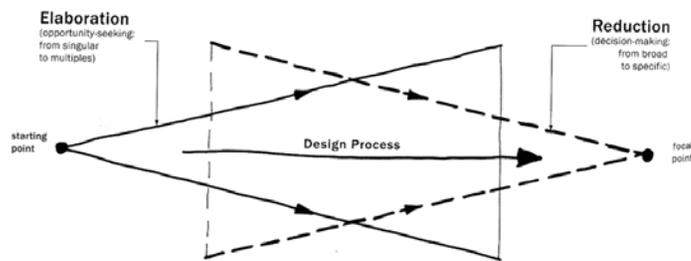
Design

Evaluate

Prototype



Getting it right the first time is hard
Need to make quick turns around loop

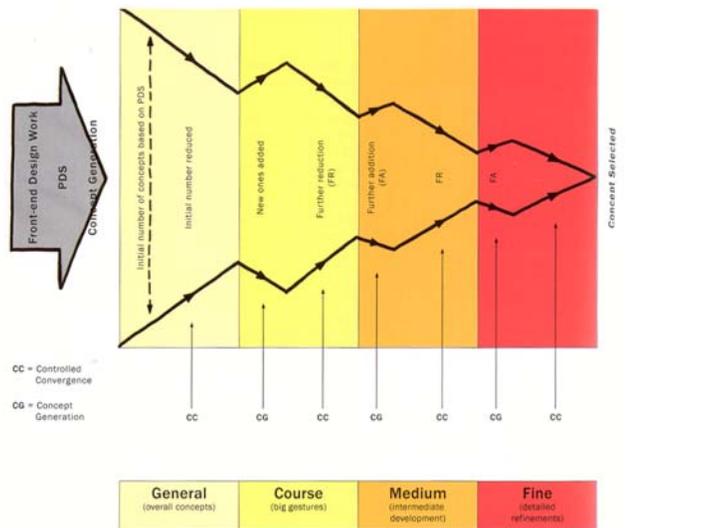


[Buxton, Sketching User Experiences]

“Design is choice, and there are two places where there is room for creativity:

- 1) the creativity that you bring to enumerating meaningfully distinct options from which to choose,
- 2) the creativity that you bring to defining the criteria, or heuristics, according to which you make your choices.”

- Bill Buxton



[Buxton, Sketching User Experiences]

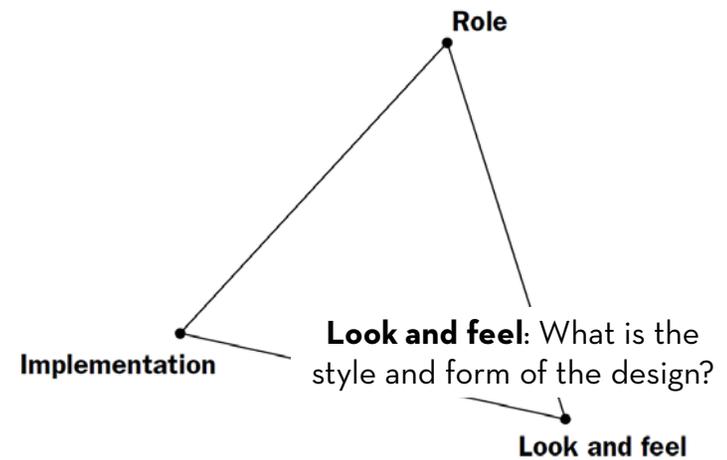
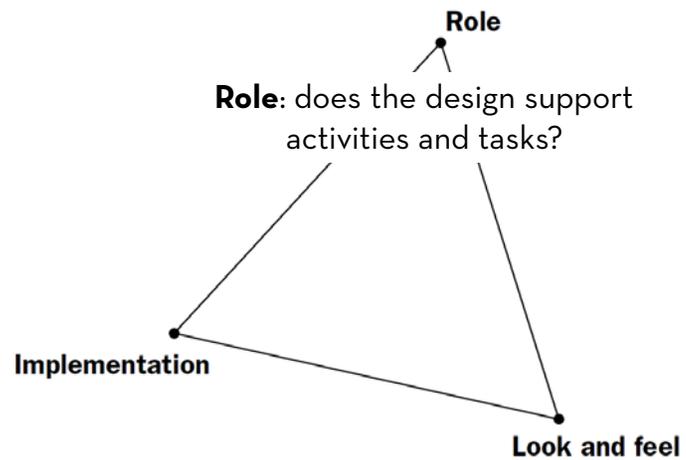
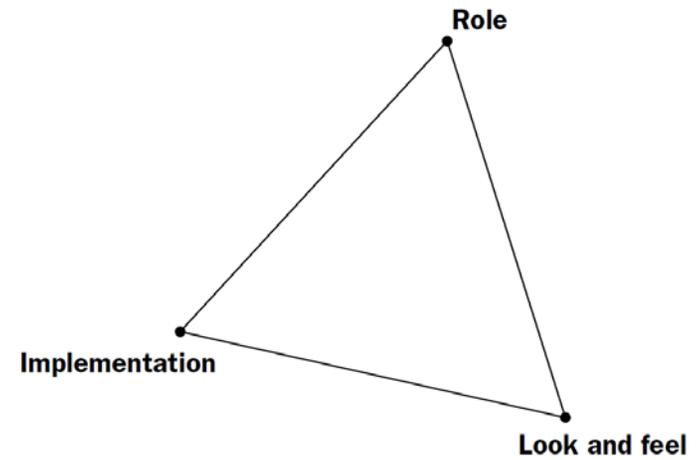
“Enlightened trial and error outperforms the planning of flawless intellect.”

- David Kelley

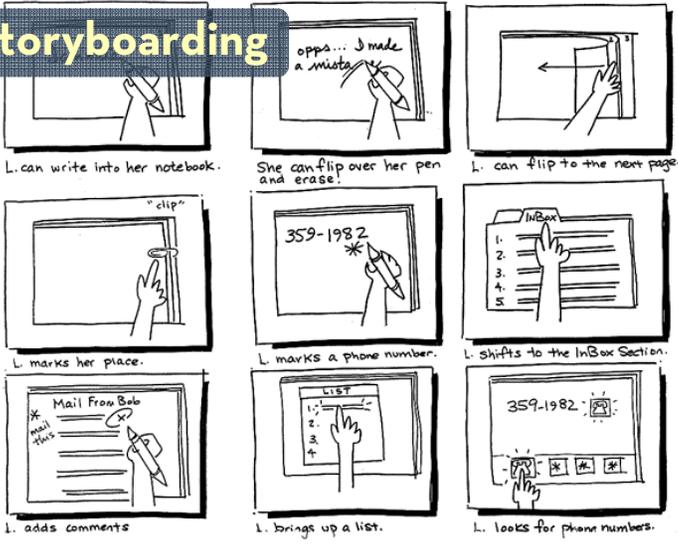
What is a Prototype?

A prototype is any representation of a design idea, regardless of medium.

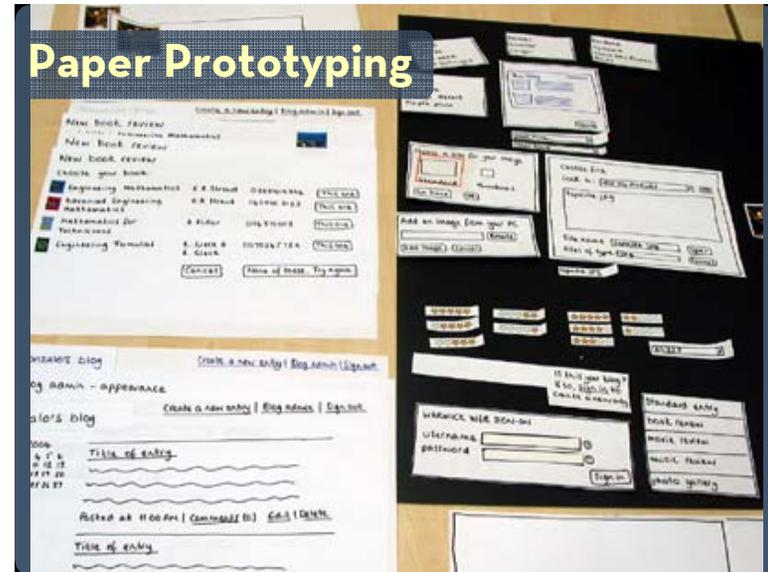
A prototype is a means for examining design problems and evaluating solutions.



Storyboarding



Paper Prototyping



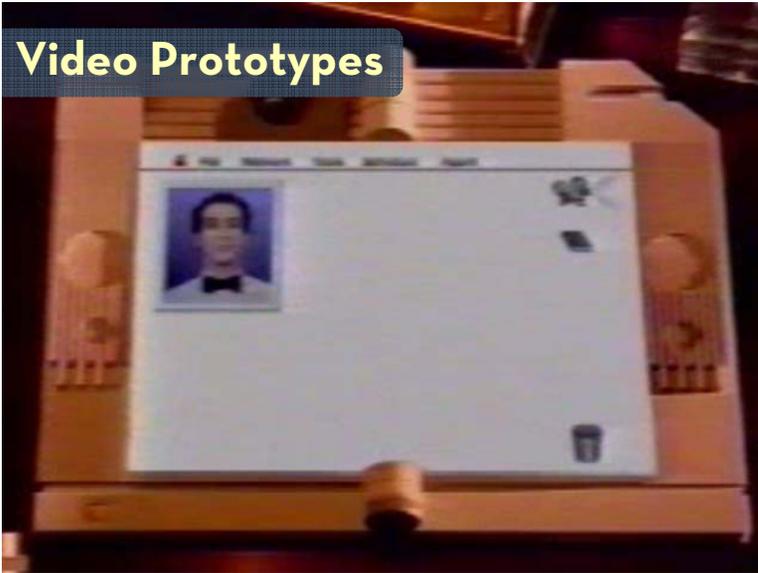
Feasibility Tests

(const IntList& oldList)

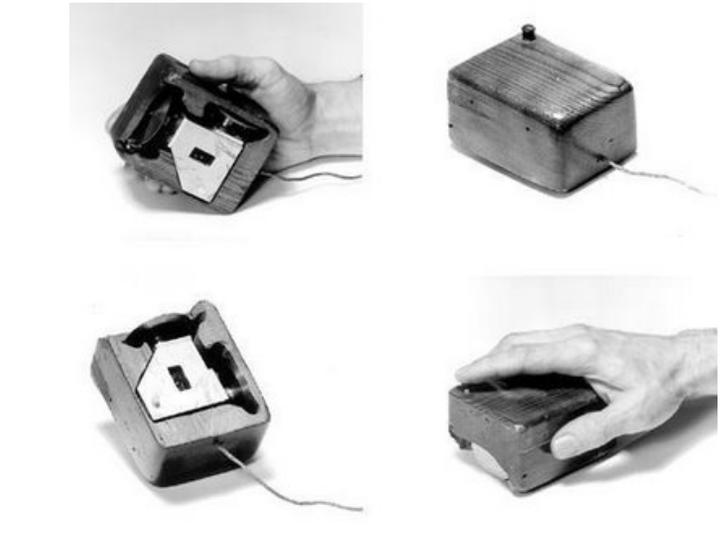
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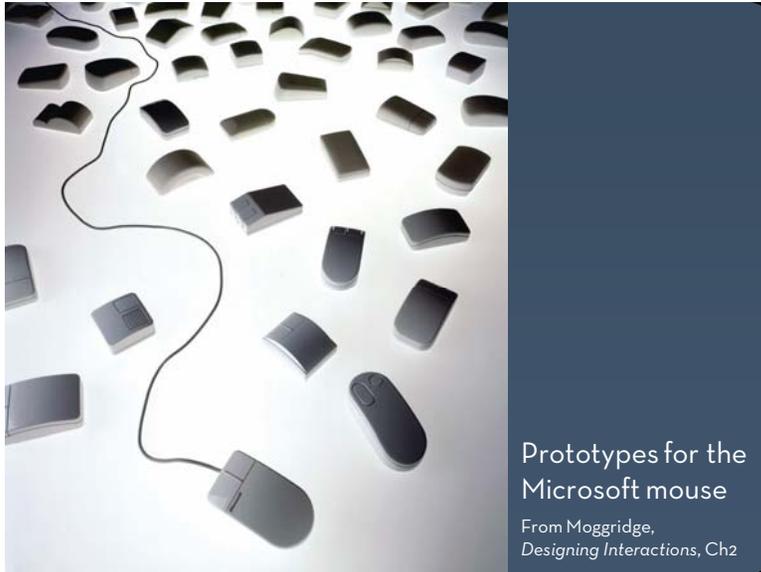
{
register long n = oldList.size;
if (n != size) setSize(n);
register int* newPtr = &values[n];
register int* oldPtr = &oldList.values[n];
while (n--) *--newPtr = *--oldPtr;
return *this;
}
    
```

Video Prototypes



Experience

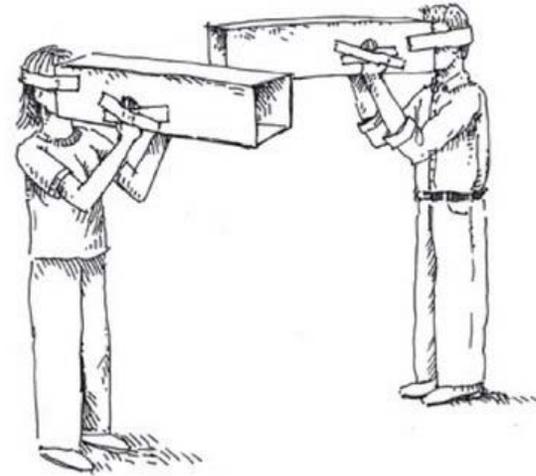




A **PROTOTYPE** is
an instantiation of a **design hypothesis**.
a means to **communicate ideas and intent**.
a vehicle for **evaluating design ideas**.

Multiple audiences – intended users, design teams, and supporting organizations.

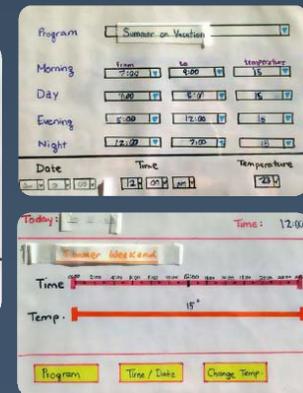
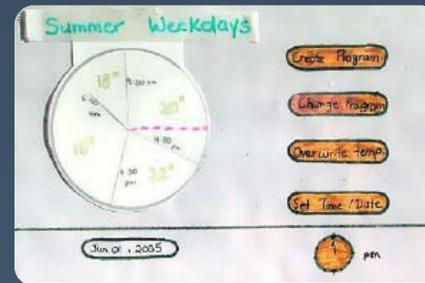
Prototyping Dynamics



Prototypes for the Microsoft mouse

From Moggridge, *Designing Interactions*, Ch2

Testing Multiple Alternatives



Tohidi et al, CHI 2006

Tohidi et al, 2006

Three prototypes for house climate control

Research subjects split into four groups

Evaluate only prototype 1, 2 or 3

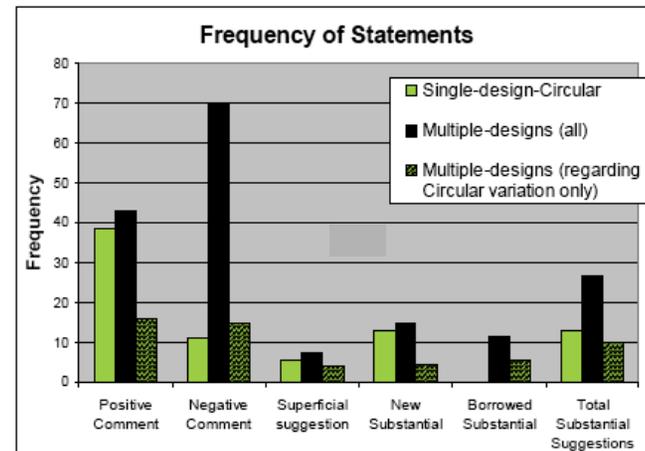
Evaluate all three prototypes

What will be the effect on ...

overall scores?

number of positive / negative comments?

suggestions for improvement?



Serial vs. Parallel Prototyping

The results of Tohidi et al. suggest benefits for the quality of feedback received when users compare across multiple prototypes.

Might exploring multiple alternatives **in parallel** improve the quality of design outcomes?

(... and how might we measure “outcome quality” in the first place?)

These questions were examined in design research experiments by Steven Dow et al.

Task: Design an Advertisement

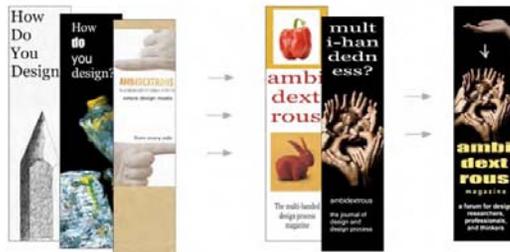


Dow et al.

serial



parallel



Dow et al.

serial



In both conditions, expert feedback (on theme, layout, composition, and other features) was provided between iterations.

parallel



Dow et al.

Measuring Outcome Quality

Click-through rate (clicks per impression)

→ Parallel ads had higher rate (445 vs. 398 clicks per million impressions, $p < 0.05$)

Time on client website (in seconds)

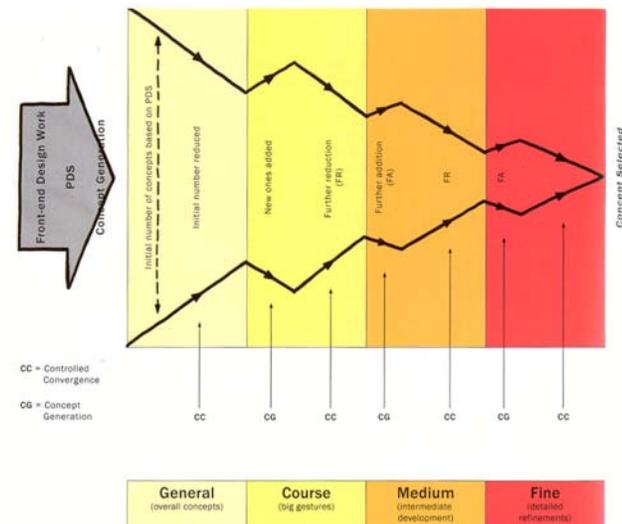
→ Parallel ads may lead to more time on site (28 sec vs. 21 sec, $p = 0.076$ n.s.)

Expert ratings (by design professionals)

→ Parallel ads rated higher (24 vs. 22, $p < 0.05$)

Parallel ads more diverse

(similarity score 2.78 vs. 3.18, $p < 0.001$)



[Buxton, Sketching User Experiences]

P4: Course Project

P4 Course Project

Iteratively design, prototype, and evaluate a new application using gesture-based input.

P4 Milestones

- W5 Team Formation & Initial Prototyping
- W6 Wizard-of-Oz Testing
- W7 Functional Prototype I
- W8 User Testing
- W9 Functional Prototype II
- W10 Demo & Presentation
Final Project Presentations

Each week has a project milestone.

Team Formation

Form a team, name your team, choose roles.

Example Team Roles

Manager: coordinate team, manage web

Design Lead: design UI, push creative ideas

Evaluation Lead: design & conduct user tests

Dev Lead: manage code, devise algorithms

Create a new website for your project.

Send the URL to cs247@cs by **Thur 1pm**.

Choose an Application Area

Think **carefully** about your choice of application area. Build on your **P3 insights**. Brainstorm a variety of areas and user needs as needed.

- What needs or experiences will you address?
- Is a gesture-based UI needed & appropriate?
- Why wouldn't another approach do as well?
- Can you conduct meaningful evaluations?

Post a **1 paragraph description** of your intended application area and corresponding user need.

P4 Prototyping

P4 Prototyping

Consider multiple alternatives. Start with rapid methods then move towards higher fidelity.

For each instance, ask: *what am I trying to learn and/or communicate with this prototype?*

To what degree are you exploring the *role, look & feel* or *implementation* of your design?

Post prototypes to team page by **1pm Tue 2/12**.
Wizard of Oz testing in studio next Thur, 2/14.

Wizard-of-Oz Prototyping

To prototype an interactive system by using human operators to simulate machine behavior.



How to make a WOz Prototype

Map out scenarios and application flow: what should happen in response to user behavior?

Build interface “skeletons” (minimal autonomy)

Develop “hooks” for wizard input

Where and how the wizard will provide input (e.g., selecting next screen, entering text, recognizing speech or gestures);
Must be possible to replace later with computer

Rehearse wizard role with team mates. The wizard should be able to perform the task.

Tradeoffs in Wizard of Oz

Advantages

- Fast (faster), cheaper and more iterative prototypes
- Create multiple variations
- Identifies bugs and problems with current design
- Places the user at the center of development
- Can envision challenging-to-build applications
- Designers learn by wizarding

Disadvantages

- Simulations may misrepresent otherwise imperfect tech
- May simulate technologies that do not exist
- Wizards may need training and can be inconsistent
- Playing the wizard can be exhausting
- Some features (and limitations) can't be simulated
- May be inappropriate for certain venues (e.g., home)