

STANFORD HCI GROUP / CS247

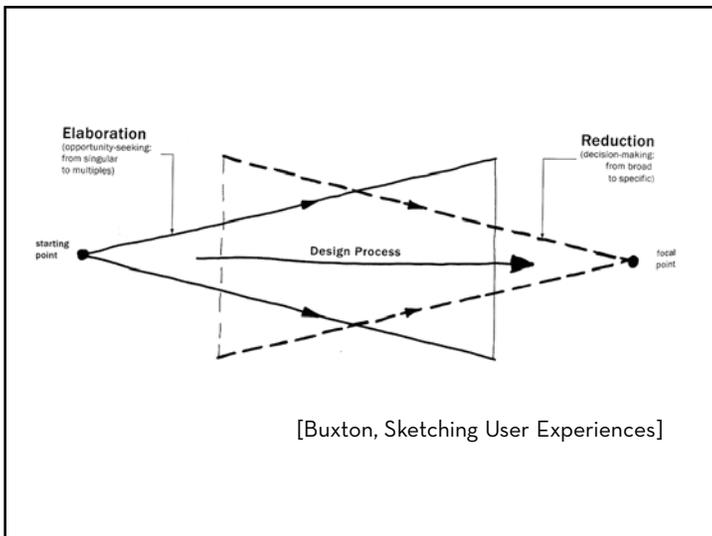
**Human-Computer Interaction  
Design Studio**

6 February 2012 <http://cs247.stanford.edu>

**Design**

**Evaluate** **Prototype**

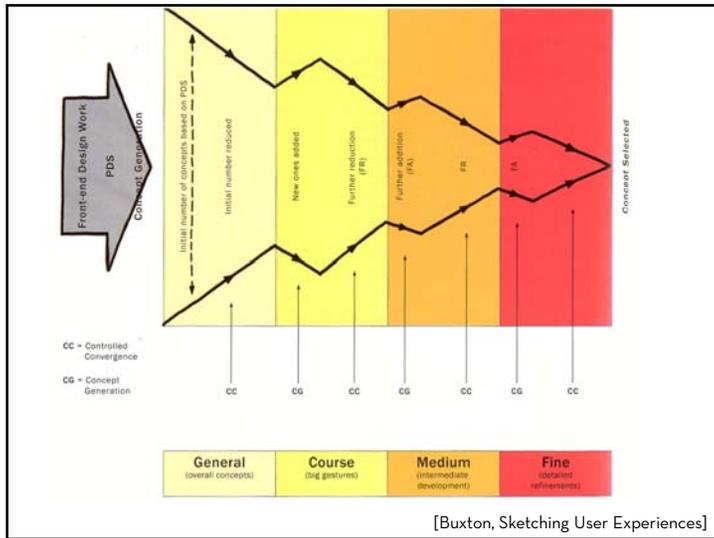
Getting it right the first time is hard  
Need to make quick turns around loop



“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



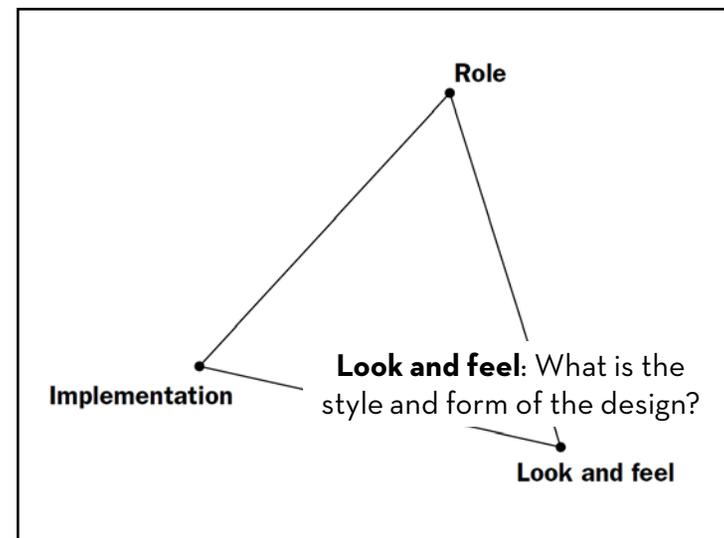
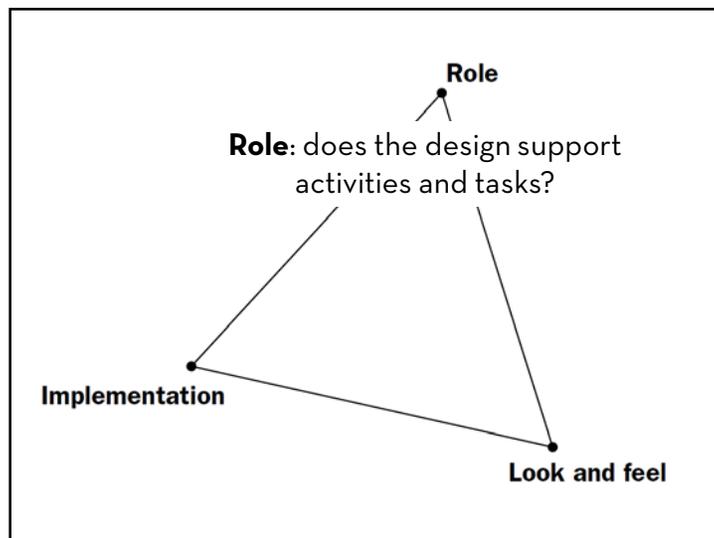
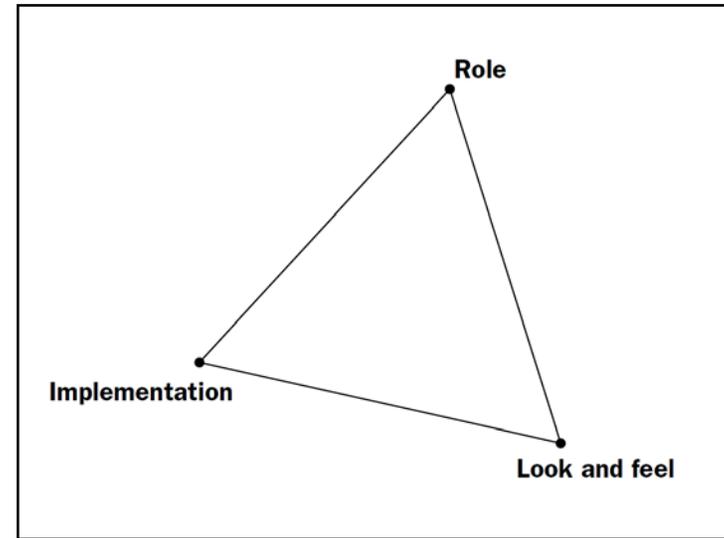
“Enlightened trial and error outperforms the planning of flawless intellect.”

- David Kelley

What is a Prototype?

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

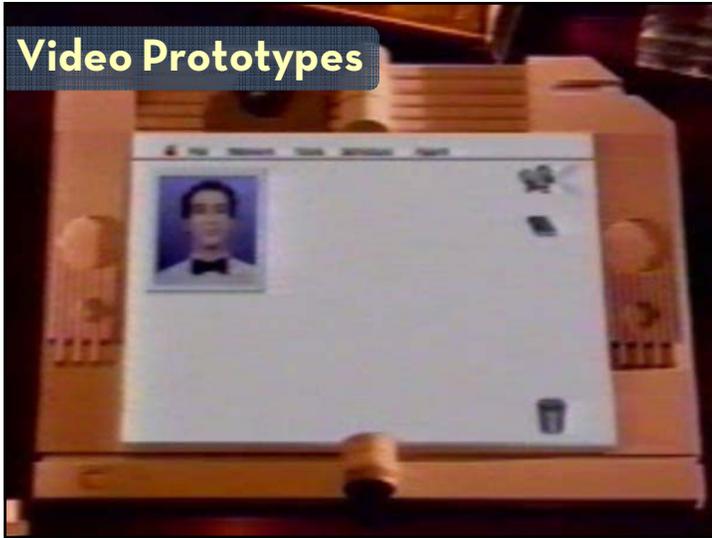
A prototype is a means for examining design problems and evaluating solutions.



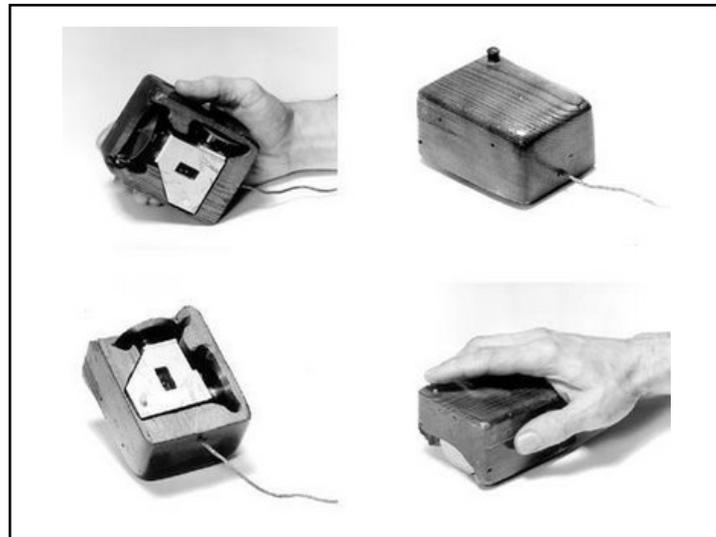
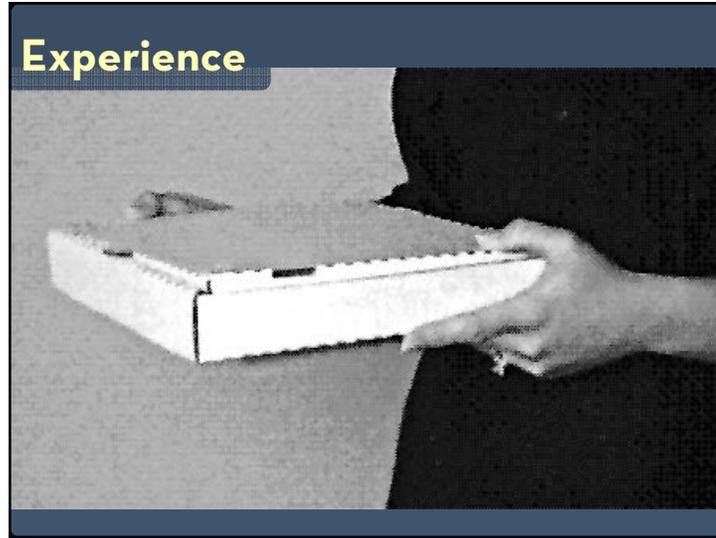


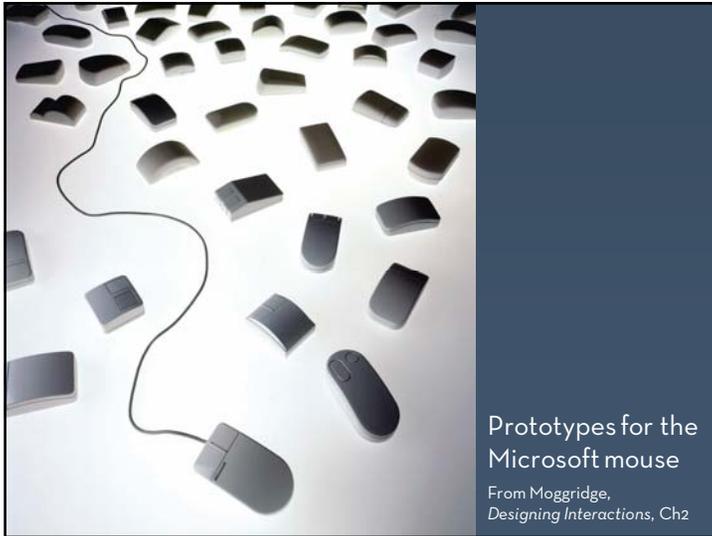


## Video Prototypes



## Experience

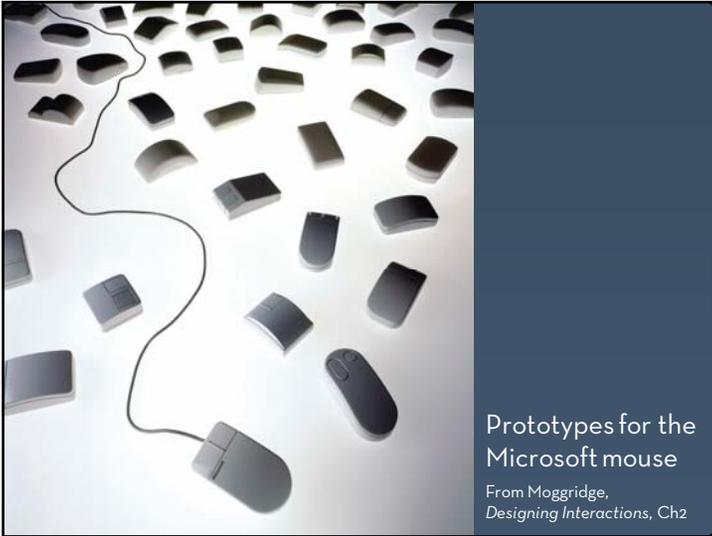
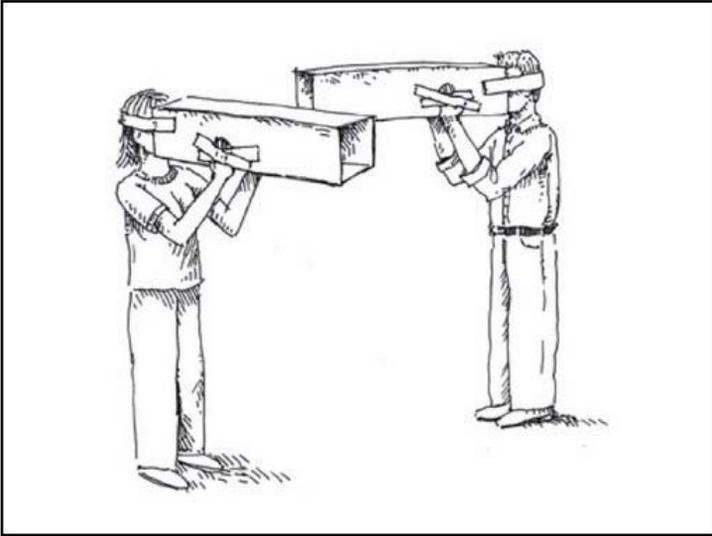




A **PROTOTYPE** is  
an instantiation of a **design hypothesis**.  
a means to **communicate ideas and intent**.  
a vehicle for **evaluating design ideas**.

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

## Prototyping Dynamics



Prototypes for the Microsoft mouse  
 From Moggridge,  
*Designing Interactions*, Ch2

## Testing Multiple Alternatives

Program	Start	End	Temperature
Morning	7:00	8:00	15
Day	8:00	17:00	16
Evening	17:00	19:00	16
Night	19:00	7:00	10

Date: 12/12/05 Time: 12:00 Temperature: 20

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

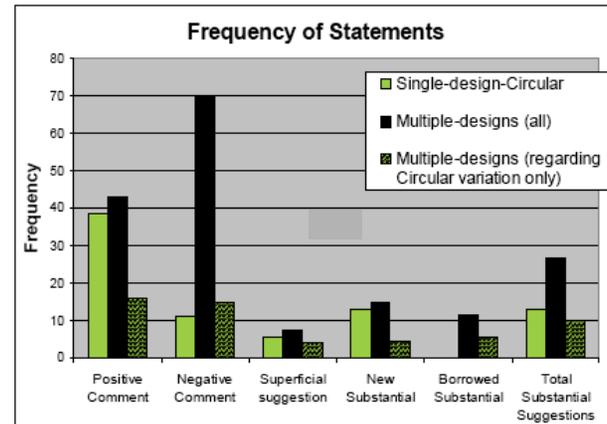
Evaluate all three prototypes

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?

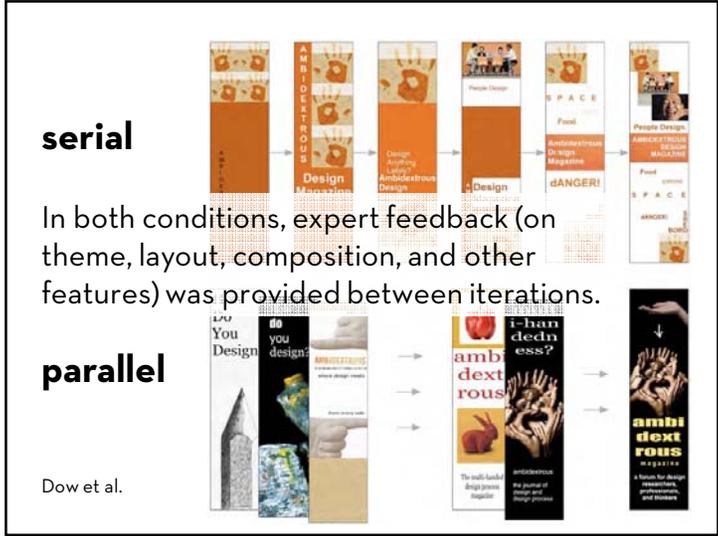
(... and how might we measure “outcome quality” in the first place?)

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

## Task: Design an Advertisement

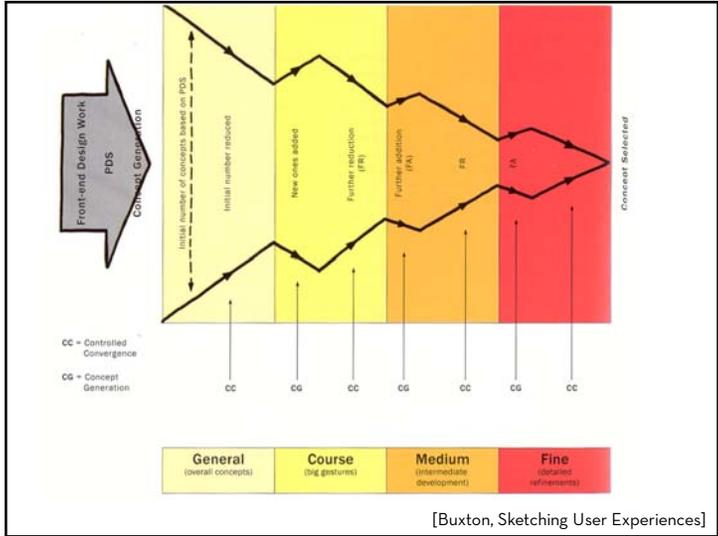


Dow et al.



## 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,  $p < 0.001$ )



## Prototyping Tools

## Prototyping as Optimization

**Reduce** Time/Effort Invested  
**Maximize** Insight & Ideas Communicated

*How might improved tools help?*

**Lower the threshold / barrier to entry**  
 → Enable larger audiences to prototype

**Accelerate prototype construction**  
 → Explore more alternatives faster

**Facilitate evaluation / testing**  
 → Gain more insight from prototyping effort

## SUEDE: Informal Prototyping for Speech-based UIs



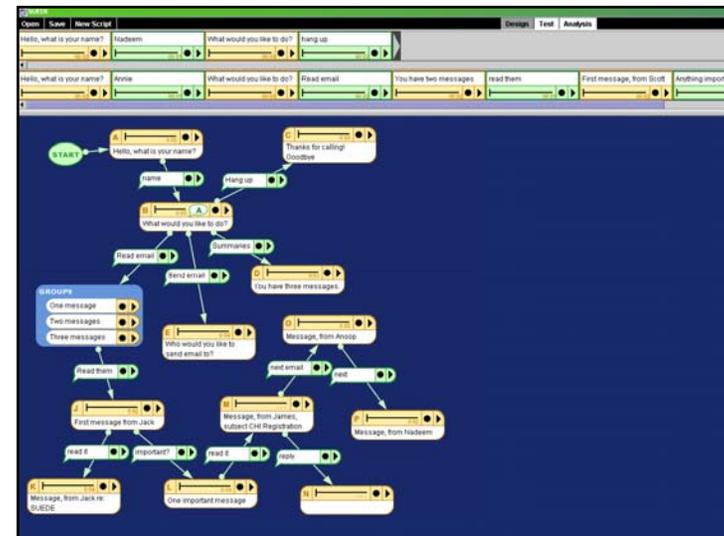
Supports design practice

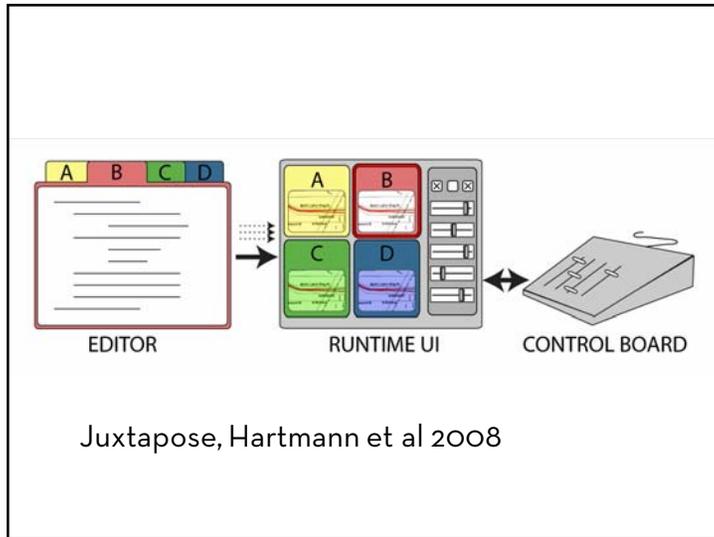
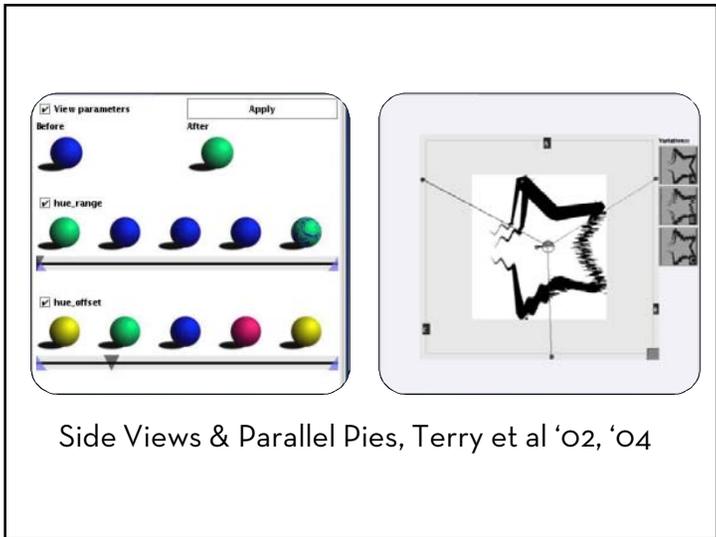
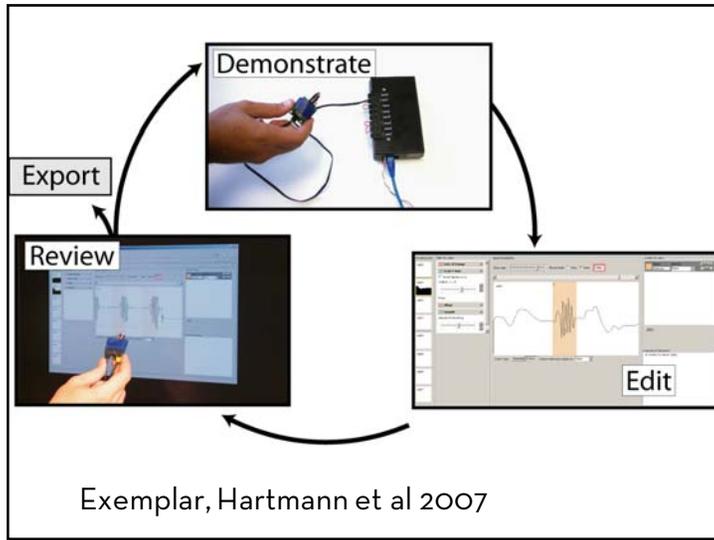
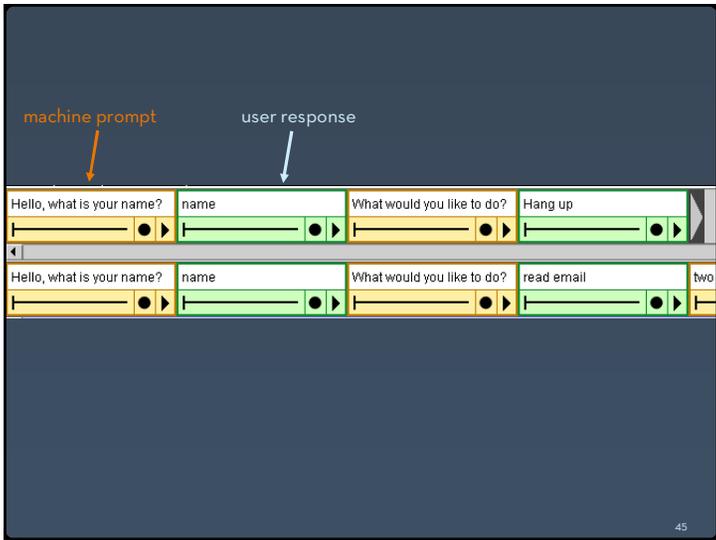
- example scripts
- Wizard of Oz
- error simulation
- iterative design (design-test-analysis)

Informal user interface

- no speech recognition or synthesis
- need not be programming expert
- fast & fluid design

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## 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?

In studio next Wed, 2/15: **Wizard of Oz testing**