Prototyping

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11 October 2007

http://cs147.stanford.edu
We've hired the world's most innovative design firm.

We'll observe their successful methods and steal them for our own. Heh heh heh.

Maybe their secret is hiring smart people.

I'm hoping it involves easels.
Prototyping matters a lot in the real world

- SANTA CLARA, California -- People thought Jeff Hawkins was crazy when they saw him taking notes, checking appointments, and synchronizing a small block of wood with his PC, pretending all the while that the block was a handheld computer.
- "If I wanted to check the calendar I'd take it out and press the wooden button"

WHAT IS PROTOTYPING? (and what does it accomplish)
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
Prototypes go through multiple versions along the way

- Danger Sidekick
- Danger Sidekick 2
- Danger Sidekick 3

Note: these aren’t the prototypes, but Danger used an extensive prototyping process.

Source: Danger, Wikipedia
Thinking Through Prototyping

Colleagues
Clients
Users
Ourselves
Colleague feedback

- Does this product meet the requirements?
- Is everyone on the same page?
Client Feedback

- Does the product meet the requirements?
- What variant do you prefer?
- Is everyone on the same page?
“the companies that want to see the most models in the least time are the most design-sensitive; the companies that want that one perfect model are the least design sensitive.”
Users feedback

- Does it work?
- Does it match his/her mental model?
- Is it ergonomic?
- How to use the product effectively?
- What to change in the product?
- What other questions arise?
Ourselves feedback

- Have I thought through all of the details?
- Does it match what I imagined?

**NOTE:** fresh eyes matter. Don’t just rely on yourself for feedback.
Two key questions to ask

- What do you want to learn from it?
- What do you want to communicate with it?
Pragmatic v. Epistemic Activity

[start] START [goal] GOAL


[start] START [next] ???

[Kirsh, Maglio 1994]
[Klemmer, Hartmann, Takayama 2006]
“In engineering, enlightened trial and error, not the planning of flawless intellects, has brought most advances; this is why engineers build prototypes”
IDEO Camera
Prototyping is a “Reflective conversation with materials”

Building and discussing yields design ideas

Prototyping in iRoom

Source: CS247 Project
What information do we get?

The reflective conversation

- Does the prototype do what we want?
- What questions do users have?
- What should we change before implementing?

Very important to decide what you want before prototyping
Visibility
Storyboarding

- Versatile
- Quick
- Powerful

How might we help people find the right train?

3: how might we?
FIND OUT ABOUT THE SALE
If we had a robot that had information about history of every item it could speak 200 languages?

Having a price board to point to, with other information as well.
What Do Prototypes Prototype?

Figure 1. A model of what prototypes prototype.
Form prototype

- Looks good
- But doesn’t really work

Project inkwell “Spark”
computing device concept

Nintendo control pad mockup

Function prototype

- Looks like wireframes (no fonts, colors)
- Interactive functionality (spectrum up to working all the way)

Experience prototype

- Video prototyping
- Role playing

Figure 1: The patient’s experience kit.
When participants were posed this indicated that they had received a defibrillating shock; they recorded their surroundings with the camera, and noted their impressions.

Figure 2: Experiencing a train journey.
The team combined objective passenger research with subjective discovery as they played out roles they assigned each other.

Figure 8: The Kiss Communicator.
This pair of prototypes let people have the hands-on experience of creating, sending and receiving subtle sensual messages. Video helped to create an appropriate context.

Make multiple prototypes to get most value

Figure 1. The “Circular” paper prototype

Figure 2. The “Tabular” paper prototype

Figure 3. The “Linear” paper prototype

Prototypes should be disposable
The rights of an intermediate representation

- Should not be *required to be complete*
- Should not *need to be updated*
- Should be easy to change
During prototyping, options narrow as fidelity increases.
Prototyping techniques

- Paper
- Powerpoint
- Video
Paper prototyping

Powerpoint Prototyping

Powerpoint Prototyping

Building shared identity
Seniors use a digital camera to take pictures at events at a community center, creating a shared identity among its members. This identity is then propagated through the display of photos/images on a wall-sized display at the center.

Fostering place attachment
Photos are broadcast to digital picture frames in the homes of other seniors in the area. This provides seniors at home with a window into the community, building attachment even when they cannot or choose not to participate in community events.

Staying abreast of community events
A touch screen in seniors' homes provides an interactive schedule of events. With the picture frame, this allows seniors to stay abreast of what is happening at the community center even at their homes.

Lowering isolation
The touch-screen schedule invites this feature with opportunities for participation.

Meeteteetse
social well-being through place attachment
Kynthia Brunette, Matthew Eisenhardt, Erik Pinkston, William Ryan
Navn Meeteteetse, Indiana University School of Informatics

Video Prototyping

Starfire Video Prototype: "Julie was looking forward to a good day until Michael O'Connor tried to deep-six her sports car project. Now, only her team, scattered around the world, can save her..."

Technology Featured in the Scene
Meeting room with telepresence for remote members
Large screen for multimedia presentations
Laptop computer with chorded input
Wireless connectivity between laptop, library server, and the big screen
Bidirectional hypertext links between database items

What (and when) does formality get you somewhere?
Lead User Innovation
Lead User Innovation

The Long Tail of Interaction

Situational Applications
Toy Inventors
Glue Types

Hot glue VS. Dovetail joint
Eye to the future: exemplar

Exemplar: Authoring Sensor Based Interactions

Announcements

- cs547 tomorrow: Paul Dourish, UC Irvine
  The Accountability of Presence: Location Tracking beyond Privacy
- The relationship between weekly assignments and the final project
Further Reading

- Bill Buxton, Sketching User Experiences
- Bill Moggridge, Designing Interactions
- Carolyn Snyder, Paper Prototyping
- Michael Schrage, Serious Play
- Houde and Hill, What do Prototypes Prototype?