

# Brainstorming and Work Redesign

# Contextual Design: Stages

- Interviews and observations
  - Done this
- Work modeling
  - Five Models
- Consolidation
  - Affinity diagrams + consolidated models
- Work redesign
  - Starting
- User environment design
- Prototypes
- Evaluation
- Implementation

# The Process Up To Now...

- Field data provides us data on what users do
- Work models structure that data, highlight how work is performed and where breakdowns exist
- Affinity diagrams consolidate data across models, interviews, observations
- *Hierarchical Task Analysis* allows us to identify a promising task area for redesign
- What's next?

# Summarizing User Needs

- *Affinity diagrams reveal major issues designs need to address*
- Use affinity diagrams to create a list of unmet needs for your users
- List every possible aspect of work that could be improved, *without indicating how it could be improved*

# Moving to Design

- Could start sketching out UI designs
- What do such designs presuppose?

# Jumping to UI Design

- Interface designs are only meaningful if we know the computational environment in which our designs will exist
- Examples:
  - Java-based?
  - Web-based?
  - Mobile platform?
  - Cell phone form factor? iPhone, Android, or BlackBerry?
  - Wall-based?
- What is wrong here?

# Jumping to UI Design

- Interface designs are expressed in the context of a computational environment
- Requires commitment to a computational medium
- Computational medium colours our perception of what is and is not possible
- Causes us to prematurely commit to designs without fully exploring the design space
- Frames our initial, potential solutions in terms of *technology* rather than *user needs*

# Redesigning Work

- Before we get to UI design, need to consider how we will redesign work
- What services will new system provide?
- What problems will it address?
- Does it offer point fixes or entirely new ways of working?
  - A whole spectrum of work modification possible



# Planning for Success

- *Not enough to design something new and different*
- How will we know we are successful?
  - Want to *significantly* improve workflow in a demonstrable way
- What are some ways we could measure our success?
- Need to define a vision of what a successful outcome will be

# New and Different

- Be cautious of interface eye candy
- If interaction is broken, a better interface won't necessarily make fundamental problems vanish
  - Example: Videographers and the Storyboarding software for Mac PCs





- “You can put lipstick on a pig, but it’s still a pig”
  - Barack Obama

# Easy to use, User-friendly?

- What is the problem with these terms?

# Easy to use, User-friendly?

- What is the problem with these terms?
- If interface doesn't support tasks, no amount of "easy to use" will help
- What does it mean for something to be "easy to use"?
  - Different for different people.
    - Linux versus Windows?
- How can this be measured, quantified, or justified?

# Measuring Improvements

## **Need concepts that can be measured:**

- Learnability
  - Time to expertise
  - Self-revealing
- Efficiency
  - Task time
- Work load
  - Physical
  - Cognitive
- Desirability
  - Attractive, appealing or compelling
- Flexibility
  - Adaptive to work
  - Coverage of work processes
- Robustness
  - Forgiving
  - Recoverability

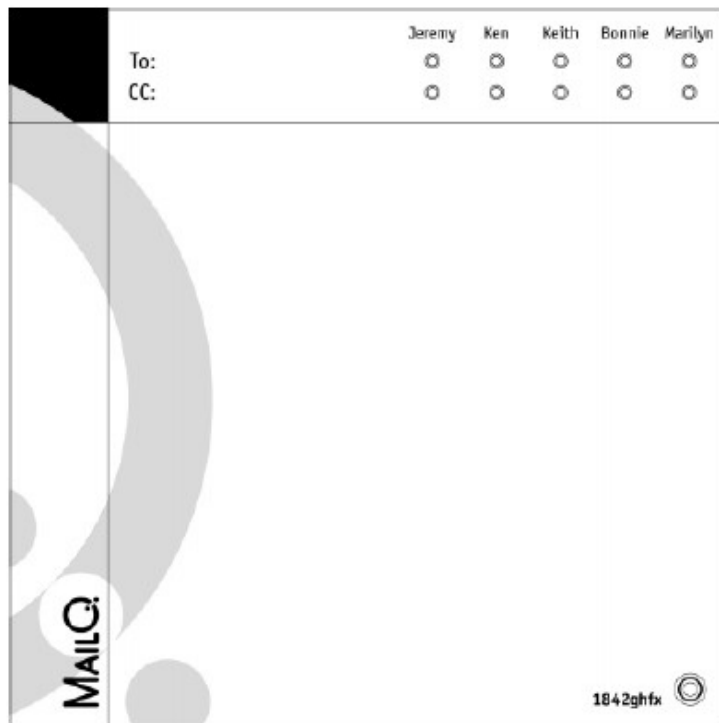
# Developing Your Vision

- Computation may help:
  - One small, troublesome task
  - Completely redesign work
- May result in work completely performed in digital realm
- ...Or in work performed with existing physical artifacts, augmented digitally
  - Hybrid digital and physical media
- Preserve what works!
- Examples...



# Paper PDA

Heiner, Hudson, Tanaka (UIST, 1999)



# Anoto Pen



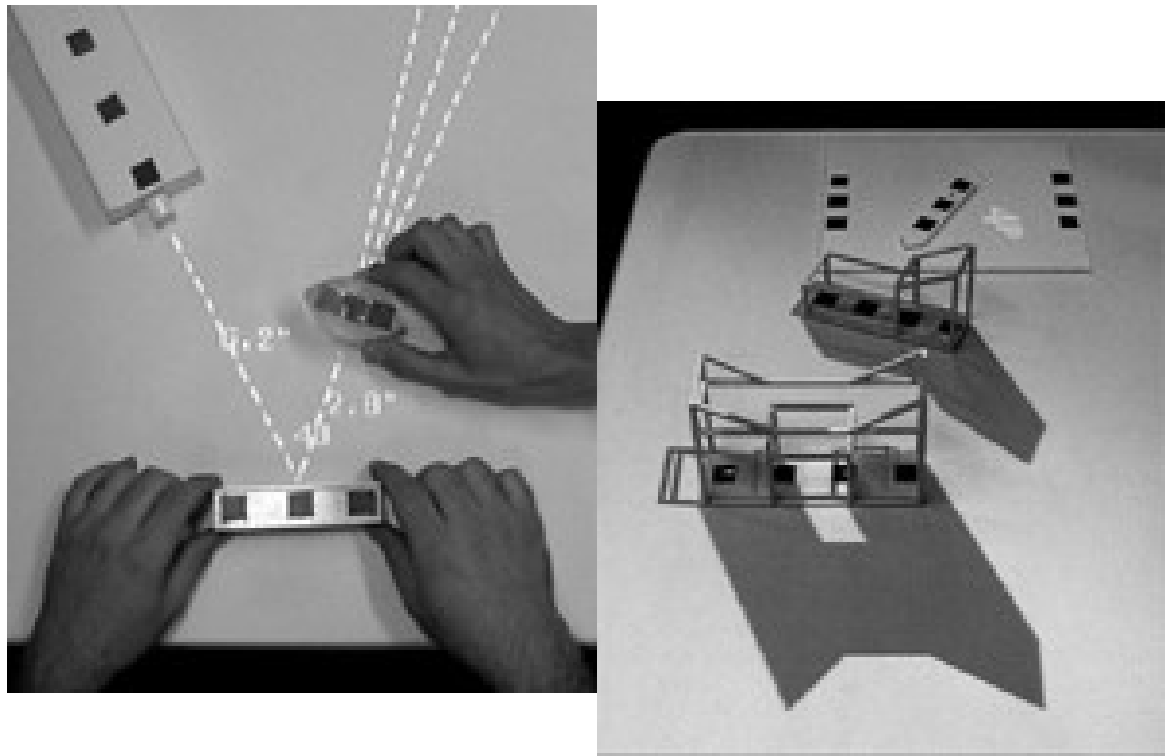
# IBM CrossPad



# Synopsis

- Above examples pre-suppose that paper-based work is good
- Trying to solve “the physical-digital divide”
  - Preserve paper-based work
  - Add computational support for archiving, sharing, dissemination
- Other examples exist ...

# Illuminating Light / Luminous Room



John Underkoffler, Daniel Chak, Gustavo Santos,  
and Hiroshi Ishii

# Wii



# Preserving What Works

- Do not pre-suppose specific technology at this point
  - Can force users away from practices that work
  - Consider PDAs in nursing
- Recognize what is good about existing systems
- Consider how you can naturally augment them
- Include these points in a “vision” new system

# Creating a Vision

- Vision is a summary that includes
  - Summary of problems (breakdowns) that will be solved
  - Summary of what currently *works*
  - Your vision of how you will redefine and improve work *practices*
  - Metrics you will use to measure success in solving those problems
- One or two paragraphs of text
- *Does not need to include design ideas and implementation details at this point*



# Example Vision

Users of current debit card terminals encounter difficulties providing account information. Specifically, the method of providing account information, swiping a card, is error-prone due to card readers that can read a card in only one orientation. These card readers can also require several swipes due to the unreliable nature of the technology and the need to swipe within a particular range of speeds. However, the form factor (a thin plastic card) is convenient as it can easily be placed in a wallet.

Continued...

# Example Vision Cont...

We will improve this process by creating a system that retains the convenience of the existing form factor, but results in a significantly faster exchange of account information with significantly fewer errors on the part of the user.

# Moving to Design

- You have your data
- Brainstorming is a tool to explore the range of possibilities
  - Kind of obvious
  - There is a culture of brainstorming
  - Similar to culture of design critiques

# Brainstorming

- Brainstorming as an activity to broadly explore the solution space, possible designs
- The time to think outside the box
  - Cliché, but ...
  - Think Ideo again: Good ideas come from bad ideas.
- Repeatedly used during Contextual Design at this stage

# Contextual Design: Stages

- Interviews and observations
- Work modeling
- Consolidation

- Work redesign
- User environment design
- Prototypes



Brainstorming

- Evaluation
- Implementation

# Preparing for a Brainstorm

- Start with crisp problem definition
  - “We want to solve X”
  - Phrase in terms of problem, not technology
- List what already works well in current system
- Go over your data
- Get inspiration from other fields/areas
  - Go to periodical section of library and read lots of different magazines
- Bring a bunch of weird, unique stuff in
  - Doesn't have to have any clear relation to your problem

# Ideo Tech Box



Photo by Joi Ito  
(from Flickr)

Photo from ideo.com



# Brainstorming Logistics

- Use big pads of paper or Post-Its to put up ideas
- One person writes down ideas
- Number your ideas
- Sketch, diagram, model the idea
  - A sketch can communicate the idea better
  - Also suggests new ideas



# Brainstorming: Rules of Engagement

- Talk should be lively, but make sure people get their full idea out
- “Yes, and...”
  - No “No but’s”
  - Build on others’ ideas
- Everything is valid
  - No evaluation
  - No feasibility assessments
- Your opinion matters
  - No “half-assing”
    - “Well, this is probably a bad idea, but ...”

# Brainstorming Tips

- Consider solutions that don't use system's current technology
- Imitate, steal, cross-pollinate, remix
  - Take ideas from other domains and fit them into your problem domain
  - Be on the lookout for how something might apply to your problem
- Transition to different themes when ideas start to slow down for one theme
- Give yourself a target number of ideas to hit
  - Motivates to push even further

# From Visioning to Design

- Text suggests using sketched scenarios to model new workflow
  - If you draw well, go for it
  - Like storyboards
- I frequently use HTA to describe new workflow
  - Occasional sketches can show how technology fits into overall picture