

Finishing Alternative Views of CD

Plus Brainstorming/Redesign

Alternative Views of Contextual Inquiry

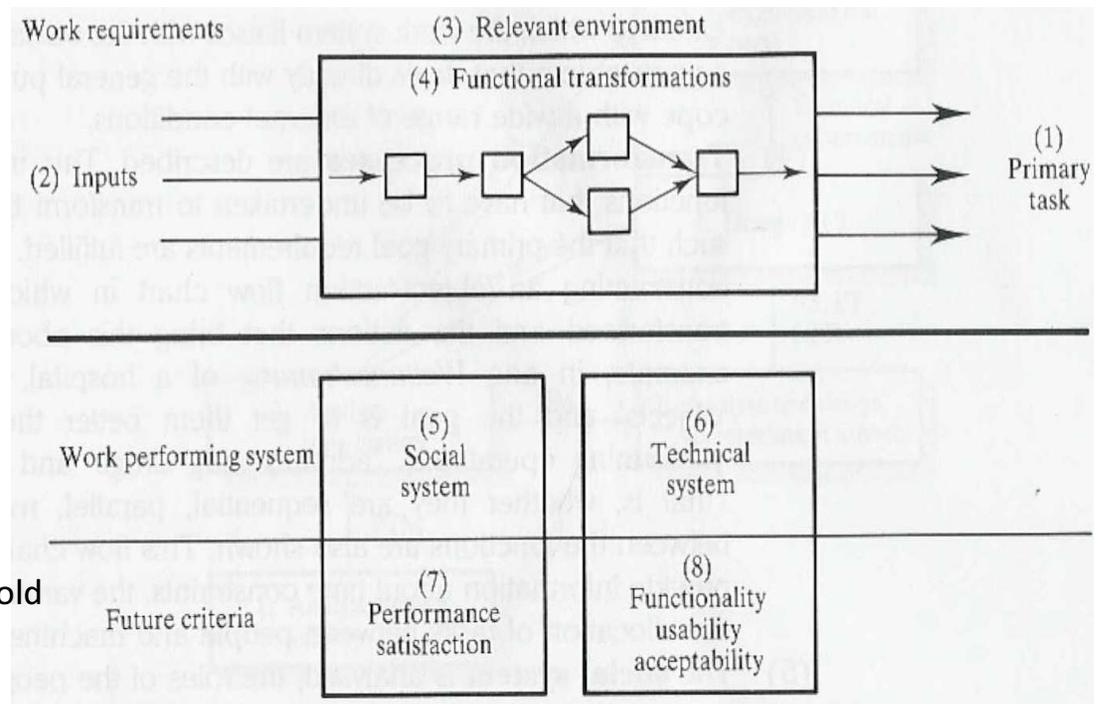
- User-Centered Design
 - Participatory Design/Cooperative Design
- Socio-Technical Models of System Design
 - USTM/CUSTOM
 - OSTA
 - Ethics
- Try to encompass the technical, social, organizational and human aspects of design
- Soft Systems Methodology
 - Explicit recognition of distinction between real world and system

OSTA

- Open Systems Task Analysis
- Specifies social aspects of system with technical aspects
- Goal is to understand how a computer will transform the workplace
- Results are depicted in flow charts and descriptions (prose)

OSTA steps

1. Specify primary task
2. Identify task inputs
3. Analyze external environment
 - Physical, economic, political, demand for output
 - Importance varies – e.g. public or private system
4. Transformation processes are described
 - Inputs to outputs
5. Social system is analyzed
 - Roles of people
6. Technical system is analyzed
 - How new system integrates with old work practices
7. Performance satisfaction
 - Social system requirements
8. Technical requirements stated
 - Functionality, usability criteria, etc.



What you can do with OSTA

- It's like a simpler form of sequence, flow, and cultural models
- Basically organizes similar information so it can serve as data during design discussions
 - Understand work requirements, transformations, primary task of system (above the line)
 - Understand the constraints on system design and development (below the line)

ETHICS

- Addresses social and technical issues using separate design teams
 - Design teams work separately and then attempt to merge solutions
- Tries to generate multiple solutions and select solution which does well in both technical and social aspects

ETHICS

1. Problem is identified. Objectives and tasks identified. Job satisfaction requirements specified
2. Two design teams are established
3. Alternative solutions against criteria established in (1)
4. Solutions checked for compatibility
5. Compatible solutions ranked against criteria
6. Detailed designs developed
 - The bridge-building problem:
 - Meeting in the middle

Summary of Socio-Technical

- Many different models but one focus
 - Understand both the social and technical aspects of the system
 - Human and technology perspective on all solutions
- In some ways, technical gets in the way
 - Emphasizes designing a solution rather than understanding the situation

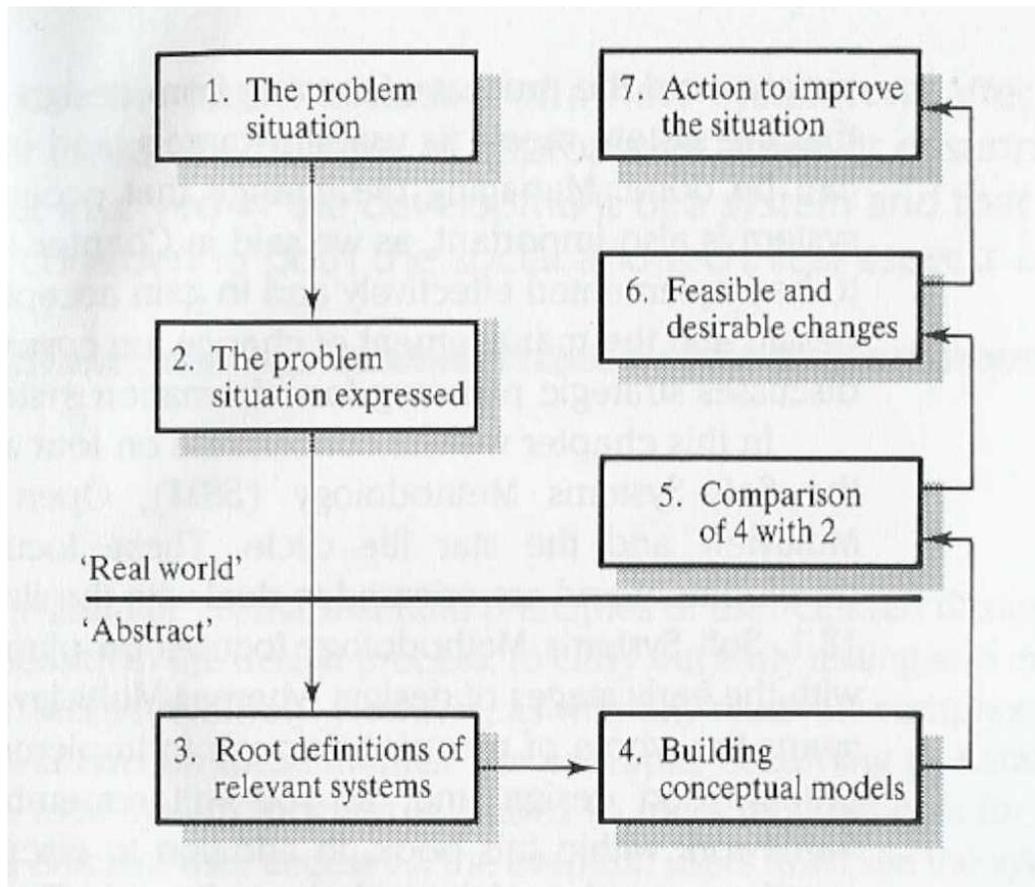
Alternative Views of Contextual Inquiry

- Socio-Technical Models of System Design
 - USTM/CUSTOM
 - OSTA
 - Ethics
- Try to encompass the technical, social, organizational and human aspects of design
- **Soft Systems Methodology**
 - Explicit recognition of distinction between real world and system

Soft Systems Methodology

- Focuses on understanding situation
- Views technology and people as components
- Flexible approach to detailed consideration of context
- “Soft”
 - No single answer
 - Takes practice to use effectively
- Only useful if it helps developer understand the wider system

SSM



- First recognize problem and develop a rich picture
 - Stakeholders, tasks, groups, organizational structure, etc.
 - Lots of contextual inquiry
- Move to system world and generate a “root definition”
 - Can be from any (or each) stakeholders perspective
- Build conceptual model
 - What system must do
 - Hierarchical modeling of transformations and activities
- Check the system for compatibility and make improvements

Other Views of CI: Redux

- Many useful concepts embedded in these other views
 - Stakeholders
 - User-Centered Design vs User-Design
- Similar thread
 - Combine an understanding of real world interactions of users with the design of technology

Why Contextual Design?

- I like the explicit aspects of contextual design
 - First interview
 - Then model users
 - Then identify task for redesign
- CD supports distributed cognition through artifacts
 - Models, affinity, UED
 - Not commonly part of other methods (though there's nothing wrong with using them)
- I find CD more useful from an educational perspective
 - Techniques can be adopted in any environment

Why talk about other techniques

- Waterfall problem with CD
 - Things don't always move forward in nice sequences
- Some information in other models can aid CD
 - Think stakeholders in CUSTOM
 - Think above/below the line in OSTA
 - Think assessing models against breakdowns as described in SSM

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:

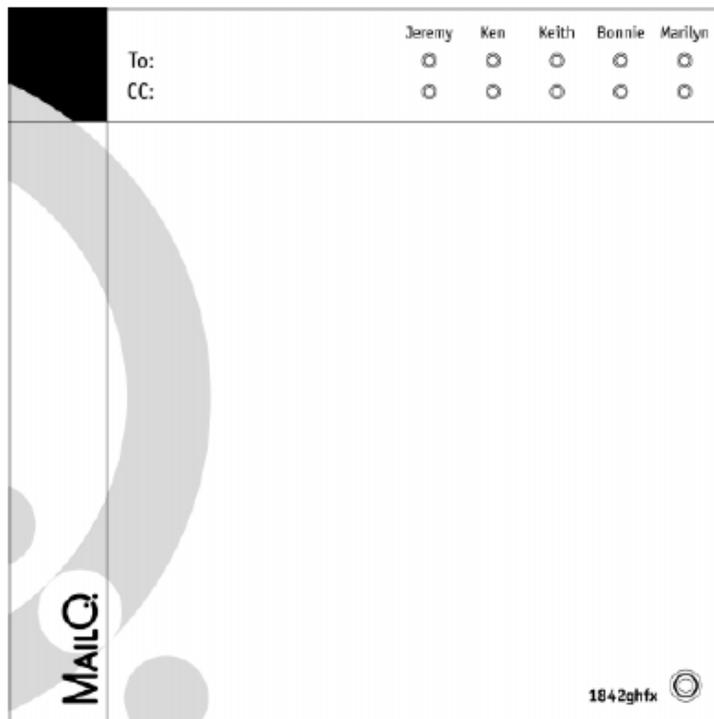
- Learnability
 - Time to expertise
 - Self-revealing
- Efficiency
 - Task time
- Work load
 - Physical
 - Cognitive
- Desirability
 - Attractive, appealing or compelling
- Flexibility
 - Adaptive to work
 - Coverage of work processes
- Robustness
 - Forgiving
 - Recoverability

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



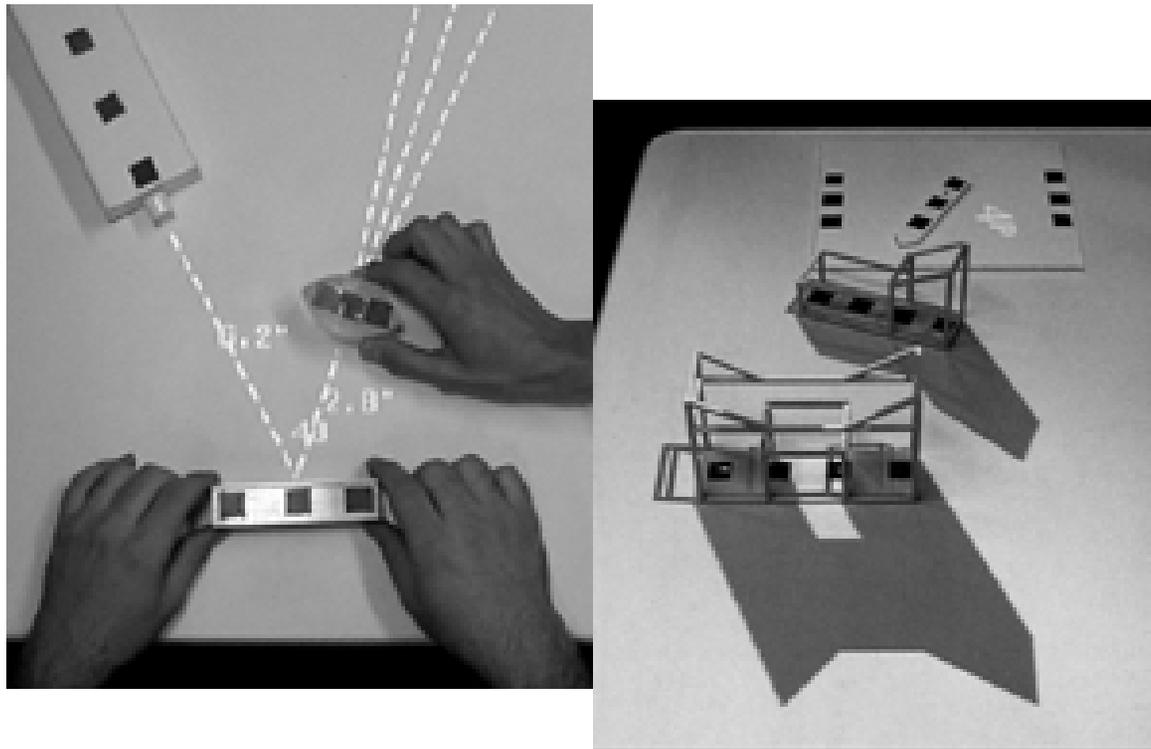
IBM CrossPad



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
- Evaluation
- Implementation



Brainstorming

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

The End