Advanced Design of Interactive Systems

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Participatory Design workshop

Each group should have prepared a 75-minute participatory design session for another group

- Design 3 activities (NOT interviews!)
- Create 3 method cards

Ensure that you use the whole session!
If your session is too short or if it isn't working use prepared backup activities

Do not waste participants' time!

Participatory design workshops

EVERYONE particiipates!!!
Designers do not act as independent observers

BUT design team has additional roles:
Moderator
presents instructions
keeps track of time
answers questions
Scribe
writes notes
Videographer
operates camera

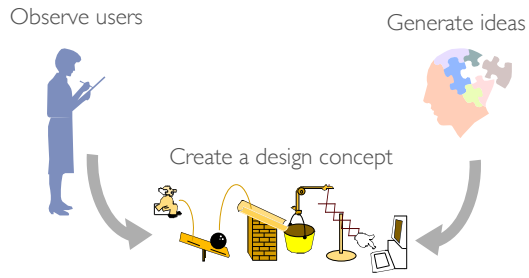
Participatory design workshops

Plan for:
instruction time
activity time
debriefing time

Use Video Clipper: as a guide for running the workshop
Create a sequence of Method Cards
Add title cards with timing and other information
(not visible to workshop participants)
Shoot video of the activity or the artifacts,
organized by method

Design Concept

Choose a concept



Describe a design concept

How will the system work?
- Functionality — what should it do?
- User guide — how does it work?
- Scenario — what happens in real-world contexts?

Justification
- What are the alternatives?
- What are the advantages and disadvantages of this solution?

Reminders

Instrumental interaction principles

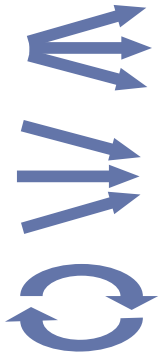
Reification	What actions are objects? Scrolling -> scroll bar
Polymorphism	What can each tool do? Scroll text, scroll images
Reuse	How can user reuse previous actions? Replay script of previous scrolling

Generative power: Three design principles

Reification
extends the notion of
what constitutes an object

Polymorphism
extends the power of commands
with respect to these objects

Reuse
provides a way of capturing and
reusing interaction patterns

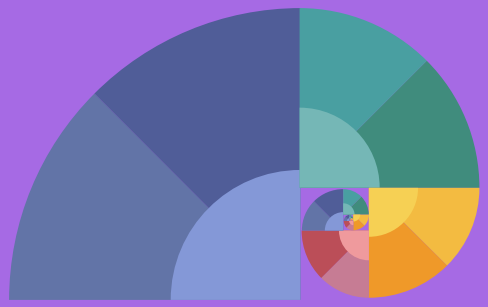


Each group should have

Design concept
Storyboard
Video prototype (3-5 minutes)

Consider?
- What are the objects of interest?
- What instrument(s) were reified?
- How does the user discover useful properties?
- How does the user manipulate those properties?

Generative deconstruction



Lecture topics

Socio-technical design principles
- Co-adaptation
- Distributed Cognition
- Peripheral Awareness
- Rhythms and Routines
- Situated Action

Group exercise

Generative walkthrough

What are socio-technical principles ?

Social scientists conduct extensive field studies
and provide deep insights in the form of
socio-technical principles
about how people interact with technology in context

But
it is difficult to translate these principles
into specific designs

Generative Deconstruction & Reconstruction

Create a scenario-based artifact that
captures current user behavior -- or --
illustrates what has been designed

First deconstruct what is going on:
Who is the user?
What is the technology?
What is the user's context?
What is the interaction like?

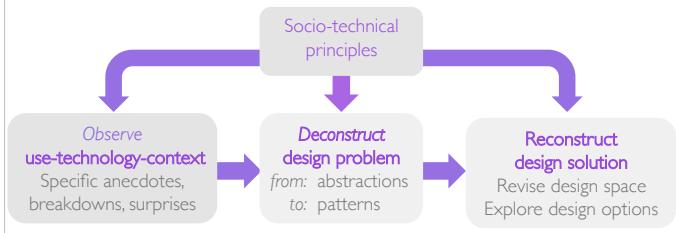
Then reconstruct the design using socio-technical principles
to design a new technology or
to fix an existing one

Examples: Socio-technical Principles

Situated Action *beyond planning*	Go beyond planned activities; Users decide how to act in unforeseen circumstances
Rhythms & routines *identify use patterns*	Build upon routine activities and spatial patterns; Users integrate systems into their daily lives
Peripheral awareness *design the periphery*	Design for both focus and periphery; Users vary degree of engagement
Co-adaptation *re-interpret use*	Expect users to re-interpret and customize; Enable capture and sharing of customizations
Distributed cognition *"outside the head"*	Let objects and other people reduce cognitive load for memory or communication tasks

Generative Deconstruction

Apply socio-technical principles to generate grounded designs



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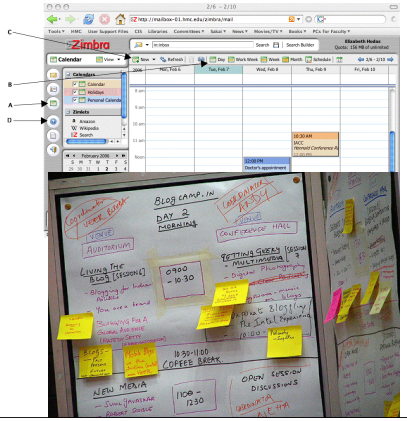
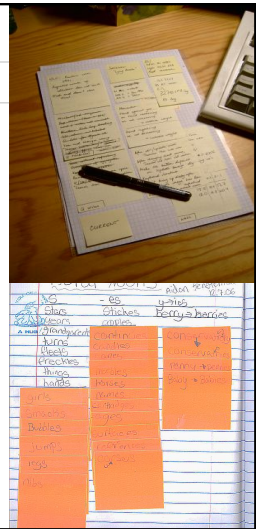
Reflecting on Post-It Notes

- What is a 'post-it note'?
- What are they used for?
- What are their most important properties?
- Why do they work?
- Have you seen any creative uses of post-it notes?

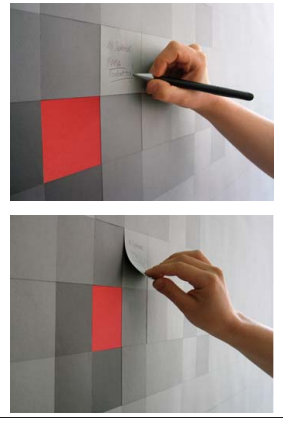
Organize with Post-Its

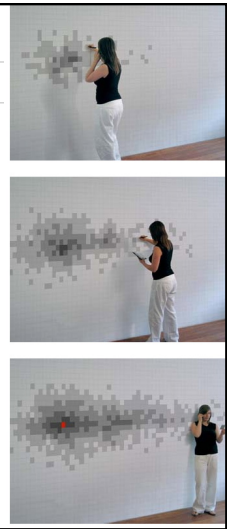
Agenda Post-Its





Wall calendar





Socio-technical Principles

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Situated Action

Situated Action

Lucy Suchman

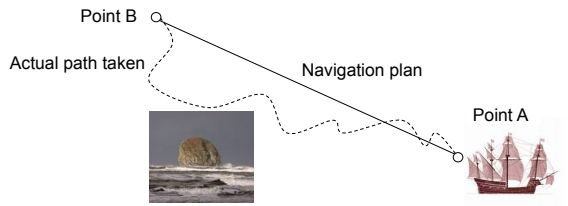
We can plan our activities
but we always act within a real-world context

How do users modify plans based on context?
How do they handle interruptions? Breakdowns?

As designers, how do we let users change
their plans at any moment?

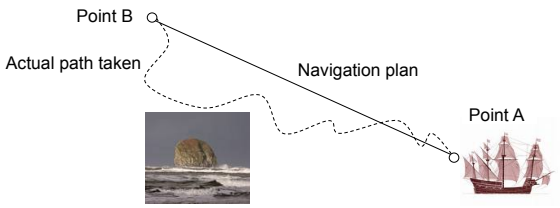
Situated Action

The plan consisted of navigating on a direct course from point A to point B including a small detour to avoid a rock. In reality, the course was an intricate series of adjustments to circumstances including changing wind, water currants, drift, and operator over-compensation.



Situated Action

a. What actions emerge when the user is in a specific situation? (*Emergent action*)
b. What objects are physically next to each other? (*Co-located artifacts*)
c. What are useful properties of the physical objects involved?
d. What are useful properties of the surrounding environment?



Situated Action

Sandy wants to meet with Fred this week, but doesn't know exactly when. She adds a post-it to her calendar, in no particular spot, to remind her to find a time to talk to Fred.

Emergent action:
Sandy knows that the dates may change, her system is flexible

Co-localisation of artifacts:
Sandy knows that when she next looks at the calendar, she'll see the post-it.

Situated Action

1. What is Sandy's problem?
2. How does she use the post-it note to solve the problem?
3. Explain why this is an example of situated action.

Situated Action

What properties make it work?

a. What does Sandy do in what specific situation? (*emergent action*)
b. What objects are physically next to each other? (*co-located artifacts*)
c. What are useful properties of the physical objects involved?
d. What are useful properties of the surrounding environment?

Rhythms & Routines

Rhythms et Routines

Biological **rhythms**

Our bodies are all influenced by external events
the sun rises, the night falls, days pass
which influences when we are hungry and sleepy

Established **routines**

Temporal routines

We go to work or eat meals at regular times
Morning commute, breakfast,

Spatial routines

We organize our activities in regular places,
Desk at work, kitchen organization

Rhythms and Routines

Ralph took a call from his son's girlfriend, Tara.

He wrote a message on a post-it note and left it at his son's place at the dinner table.

Temporal rhythm/routine:

Ralph knows his son will come home at dinner time, because he is hungry

Spatial routine:

Ralph know where his son sits at the table

:

:

Rhythms and Routines

1. What is Ralph's problem?
2. How does the post-it post-it note solve it?
3. Why is this an example of

both *rhythms* and *routines*

Rhythms and Routines

What properties make it work?

a. What makes Ralph come home?

b. How does Ralph know where to sit?

c. Will it work if dinner is late?

Peripheral Awareness

Peripheral Awareness

Human perception involves both **focus** and **periphery**

Example: Vision

Central vision: you see color, detail

Peripheral vision: you see black & white, movement

Most interactive system designers assume they have the user's full attention

… but users multi-task and live in a complex world

How can we design for what happens in the periphery?

Peripheral Awareness

Paul writes his chores on post-it notes on the fridge. He rarely reads them, but when he sees that it's "too yellow", he knows it's time to stop procrastinating and get to work.

Focused attention:

Paul can read the note when he's ready to act

Peripheral awareness:

Paul senses when there are lots of post-its and he should act

Peripheral Awareness

1. What is Paul's problem?
2. How does he use the post-it note to solve the problem?
3. Explain why this is an example of peripheral awareness.

Peripheral Awareness

What properties make it work?

a. What happens when Paul does not pay much attention?
b. What happens when Paul is actively engaged in a task?
c. How does Paul transition between levels of attention?
d. What tasks are appropriate for what types of awareness?

Distributed Cognition

Distributed Cognition

Physical objects form part of our memory
It is not necessary to remember everything

Objects can be shared among people
but they are not necessarily interpreted the same

Distributed Cognition

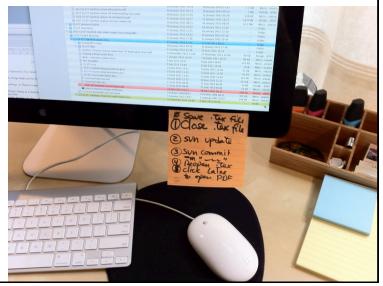
Dan and Mary share a home computer. Dan leaves a post-it note with the list of commands needed to perform a specific function.

Memory aid:

The post-it allows them to forget the details – they know where to find them

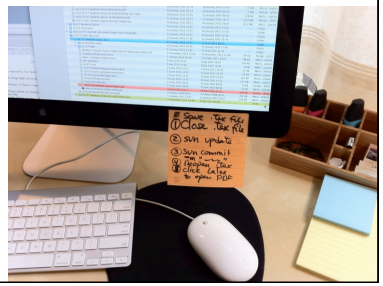
Boundary object:

Dan and Mary use the instructions differently



Distributed Cognition

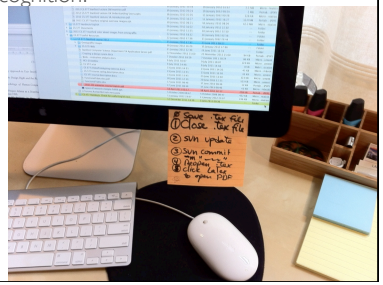
1. What are Dan's and Mary's problems?
2. How do they use a post-it note to solve their problem?
3. Explain why this is an example of distributed cognition.



Distributed cognition

What properties make it work?

a. What objects in Dan's environment aid his memory?
b. What properties of post-it notes help support distributed cognition?
c. How will other people interpret this post-it? *(boundary objects)*



Co-Adaptive Systems

Co-Adaptive Systems

Designers of interactive systems assume that
users will use them as intended

But …
although users clearly learn to use new systems,
adapting their behavior according to the system design

They also adapt them to meet their own needs

How can we make interactive systems easier to learn
and easier to appropriate in creative ways?

Co-Adaptive Systems

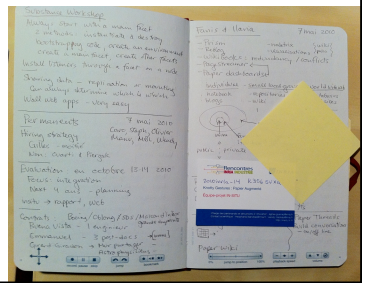
Ann is given a business card and is afraid to lose it so she uses a post-it note to attach it to her agenda.

Adapt to it:

Ann understands the properties of post-it notes (designed to stick on to paper)

Adapts it:

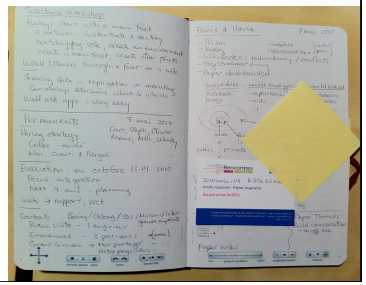
Ann uses the post-it for a new purpose (as glue)



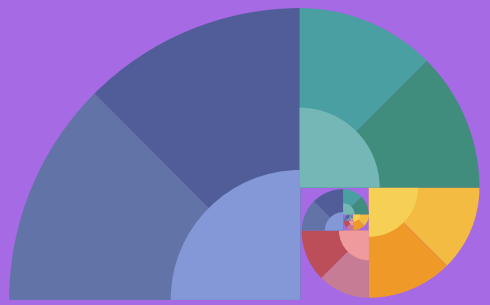
Co-Adaptive Systems

What properties make it work?

a. What does Ann need to know about the post-it note?
b. What elements were left 'open' to interpretation?
c. How was the post-it customized?
d. Can this customization be shared or applied in different situations?



Generative walkthrough



So …

How do we incorporate
socio-technical principles
into the design process?

Generative Walkthroughs: Creative redesign

Structured walkthroughs
Systematic critique of design artifacts,
such as scenarios & storyboards

Generative Walkthroughs: Creative redesign

Structured walkthroughs
Systematic critique of design artifacts,
such as scenarios & storyboards

plus

Focused brainstorming
Generation of novel ideas,
based on socio-technical principles

Exercise: Generative Walkthrough

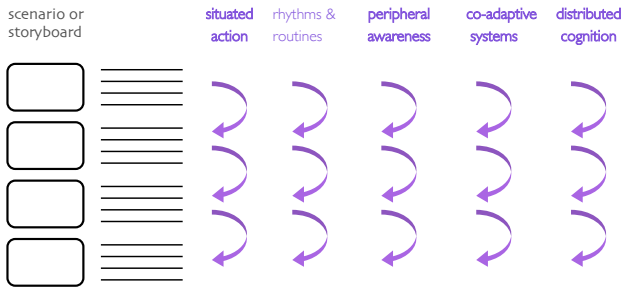
Goal Deconstruct your system based on socio-technical design principles, then reconstruct it, using them to generate new ideas for improving the system

Procedure

- Choose one of the principles
  (or assign a principle to different team members)
- Reread the storyboard out loud
- Go through the storyboard, step-by-step, examining each interaction point
- Generate at least *six ideas* inspired by *one of the principles* to improve the system from the user's perspective

Exercise: Generative Walkthroughs

Analyze your storyboard or video prototype



Exercise: Generative Walkthrough

1. Read your storyboard out loud
2. At each interaction point:
   - Identify examples of reification, polymorphism, reuse
   - Identify any existing socio-technical principles
3. Generate ideas for improving the scenario
   - you must use at least two principles

Goal: Improve your scenario so that you have at least six new interaction points that illustrate socio-technical principles

Final Presentation

Friday 14:00 Building 660 (Digiteo) Amphitheater

15-minute presentation per group plus 5-minute discussion
All members of the group participate in the presentation

Introduction	Project name and design concept: Problem to solve? Solution?
Story	Illustrate the design concept
Justification	Which principles did you choose? Why? (justify based on user studies)
Conclusion	What worked? What didn't? Future?

Grading

Jury will judge on:

Creativity
Design principles:
reification, polymorphism, reuse, co-adaptation
situated action, peripheral awareness,
rhythms & routines, distributed cognition
Relationship with user studies
Justification

Tell a story that illustrates how your design concept is used
Avoid making a "How to" tutorial or a marketing video