Participatory Design

"emphasizes a tradition of user participation in decisions related to computing systems that have an impact on their work-lives"

- sometimes referred to as cooperative design
- developed in Scandanivia during the 1980's
  - based on the notion of a democratic workplace
- Aims:
  - improve the quality of the system
  - increase productivity and usability of the system
  - increase the level of user-satisfaction

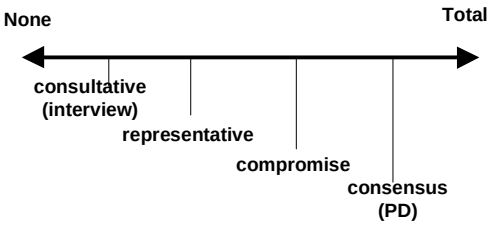
Who could participate?

- Who has a stake in the user interface design?
- Who is affected by the user interface development?

Why involve many stakeholders?

- Diverse expertise
- better product
- distributed ownership & buy-in
- greater satisfaction and confidence
- mutual education
  - help all stakeholders appreciate the design tradeoffs
- why not?

Spectrum of Involvement



Participatory design advantages

- Users are excellent at reacting to suggested systems
  - designs must be concrete and visible
- users bring important knowledge of the work context
  - knowledge may be otherwise inaccessible to the design team
- greater buy-in for the system - better results

Participatory design disadvantages

- requires a democratic workplace
  - there is a big difference between making suggestions and making decisions
  - company cultures
- hard to get a good pool of end-users
  - expensive, reluctance ….
- Different backgrounds, cultures, expertise, etc.
  - users are not expert designers
  - developers find it easier to use existing code
  - speak in different languages
- the user is not always right
  - don't expect them to always know what is right

PICTIVE

- Plastic Interface for Collaborative Technology Initiatives through Video Exploration

  "empower users to act as full participants in the design of systems that will impact their jobs and work-lives"

EXERCISE:

–Design an interface for a home grocery shopping delivery service

–Have each team member pick a different role

- store manager (1)
- delivery person / cashier / personal shopper (1)
- different types of customers (2)
- designers (2-4)

Why use PICTIVE?

"P" is for Plastic

- plastic design components
  - durable
  - inexpensive
  - encourage an atmosphere of exploration and invention
- malleable
  - interface components are seen as being very malleable, and the participants can try many variations quickly and easily
- artificiality
  - the results cannot be confused with a working system

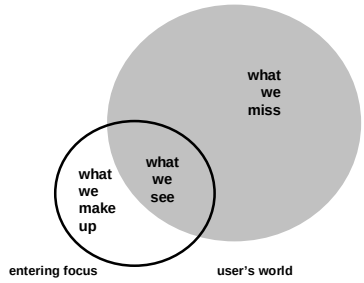
Video recording of the event - record keeping

Organization design games

- Why?
  - make a difference for the participants
  - implemention of the results are likely
  - fun to participate in
- What should you look for in a game?
  - should be fast and easy for a group of people to work with
  - should be cheap and flexible, allowing alternatives to be tested
  - should be based on concepts relevant to the actual type of productions

Interactive Icon Design

- Pictionary activity:
  - one player draws an icon and the rest of the team try to guess what the icon is
- demonstrates:
  - the difficulty of representing actions/activities with a single visual representation
  - how different background and cultures dictate people's perspectives
- you will gain insight into the potential users perspectives



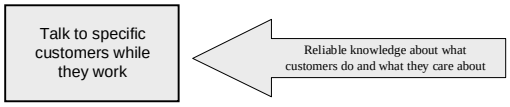
Contextual Design

- "state-of-the-art approach to designing products directly from a designer's understanding of how the customer works."
  - product designers involved in the collecting and interpreting customer data and appreciate what real people need
  - data gathered from customers is the base criteron for deciding which needs to address, what the system should do, and how it should be structured
  - focused on the customers and their work, rather than arguing over personal opinions or anecdotes of "what customers would like"

Contextual Inquiry

Team interpretation sessions lets everyone on the team bring his or her unique perspective to the data, sharing design, marketing, and business implications

Observes users as they work and asks about the users' actions as they work and asks about the users' actions step by step to understand their motivations and strategy



One-on-one field interviews with customers in their workplace to discover what matters in the work

Basic Steps to Contextual Inquiry

- Select Users to be Interviewed
  - Ideally people representative of all classes of users (managers, operators, technical support crew, etc.) should be involved in the interview process.
- Interview users and record discussion
  - Interview is performed during a typical work session. Questions are asked in order to create an atmosphere of idea sharing.
- Transcribe notes
  - Clarification of notes should be made soon after the interview is performed.
- Analyze transcripts
  - Team analysis of transcribed notes in order to atomize concepts from interview.
- Structuring of understanding
  - Group concepts into hierarchy. Organization of concepts if very important!
- Implementation of learned concepts

Contextual Inquiry - Key Points

- Reveals the details and motivations implicit in people's work
- Makes the customer and their work the needs real to the designers
- Introduces customer data as the basis for making decisions
- Creates a shared understanding of the data throughout the team

Motivations: Why Contextual Inquiry?

- Taking users out of context separates them from familiar cues, tools, and environmental aspects of their normal work environment.
- To efficiently gather information relevant to product development.
- To gather context sensitive information that is relevant and helpful.
- When asked questions out of context, users tend to speak in generalities.

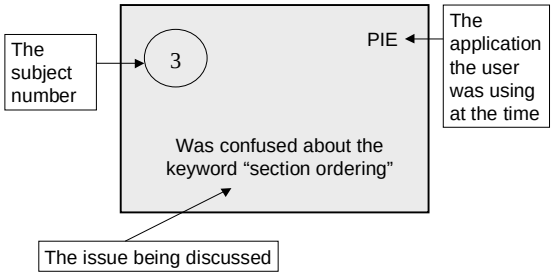
Contextual Inquity -- An Example

- Interview
  - works together with the user to build a shared understanding of the user's work practices
  - asks questions during the interview
  - invited comments and design ideas from the user
  - takes all of the user suggestions, even if they seem impossible or impractical
- After the Interview
  - interviewer transcribes the notes (ASAP)
    - typed transcripts are easier for team members to work with
  - team analysis of the interview transcripts either by coding the transcript or by building an affinity diagram

Contextual Inquity -- An Example

- Team Analysis Meeting
  - Meeting roles
    - informant: tells the story of the interview
    - recorded: captures important issues on post-it notes as the informant tells the interview story
    - participants: helps clarify the story, identifies significant issues, and generated design suggestions
- Post-its: A Software Engineering Tool
  - What is recorded on Post-its?
    - Description of users' work
    - flow or structure of the work
    - problems in users' work (e.g. interruptions to work flow)
    - problems with the computer tools (e.g. software bugs)
    - design ideas that emerge from the interviews
    - questions for future interviews

Sample Post-it Note



Building the Affinity Diagram

- Post-it notes are divided up between group members
- on a large, cleared space, the post-it notes are organized
- group works in parallel
- notes are put together if they address the same issue
- any group member can move a note if a more appropriate category is found
- team tries to keep categories cohesive
- if category is too large (more than 5 ot 6 notes), it is split up

Organizing the Post-its

- Once categories settle, category names are written on different coloured Post-its and placed above the category (1st level categories)
- 1st level categories are analyzed and then 2nd level categories are determined
- 1st level categories are then re-arranged on the wall under the 2nd level category Post-its
- if necessary the 2nd level categories can further be grouped into 3rd level categories

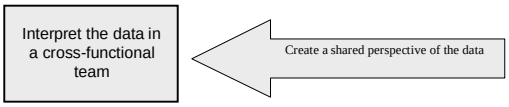
“Walking the Wall”

- The heading of the completed Affinity Diagram represent domains of work and design areas for the system
- the design team walks along the Affinity Diagram and picks out design ideas (the Post-its get marked “DI”)
- missing information is noted and the team will try to get the information during future contact with the users

What are the key factors in contextual inquiry?

- designers do the observations
- observe in the workplace
  - the experience of sitting with the customer, seeing what she struggles with daily, forces the designer to change his perspective and appreciate what the issues are and why they matter
- all the designers of the system should take part
  - it’s easier if all stakeholders have a chance to see the issues for themselves instead of trying to make them believe you.

Work Modeling



Show the work of individuals and organizations in diagrams

Work Modeling

- "people's work is complex and full of detail. It's also intangible -- there's no good way to write down or talk about work practice"
  - flow model: communication and coordination
  - cultural model: culture and policy
  - sequence model: detailed steps preformed to accomplish a task
  - physical model: shows the physical environment as it supports the work
  - artifact model: shows how artifacts are used and structured in doing the work

Flow Model

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Consolidation

Consolidate data across multiple customers

Create a single statement of work practice for your customer population

Collects data from individual customer interviews so the team can see common patterns and structure without losing individual variation

Consolidation

- "Designing for the whole customer population depends on seeing the common aspects of the work different people do"
- key points:
  - provides a map of the customer population
  - makes sense of the vast amounts of qualitative data quickly
  - identifies the needs of the customer
- gives the team a focus for the design conversations, showing how the work functions as a whole rather than breaking it up in lists.
- Affinity diagram
  - wall sized, hierarchical diagram to reveal the scope of the problem
  - help you collect similar issues and show you where you have problems (simply identify the primary issues in a domain)

Affinity diagram

Figure page 38

Work redesign

Invent solutions grounded in user work practices

Imagine and develop better ways to work

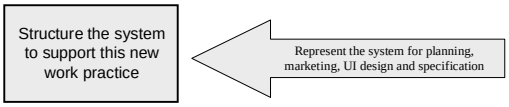
Brings the designers together to discuss the consolidated data and how technology can improve the work

Work redesign

- Focuses the team on improving work, not delivering technology
- Brings the designers together to discuss the consolidated data and how technology can improve the work
- Vision - a story of how customers will do their work in the new world we invent (scenarios and storyboards)

User Environment Design

Floor plan of the system

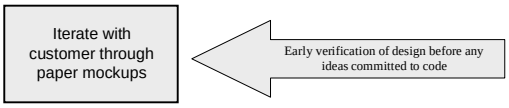


Shows each part of the system, how it supports the user's work, exactly what function is available in that part, and how the user gets to and from other parts of the system -- without tying this structure to any particular user interface

User Environment Design

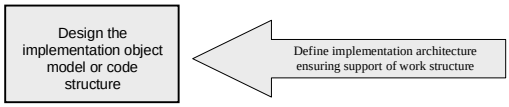
- Used to create NEW systems
- Reverse UED can quickly reveal many structural problems for existing systems.
- Allows you to focus on the structural level of the system (regardless of the UI)
  - good for analyzing competitive systems

Mockup and Test with Customers



Paper prototyping and iterative design and testing

Implementation Design



Divide functionality into a series of releases

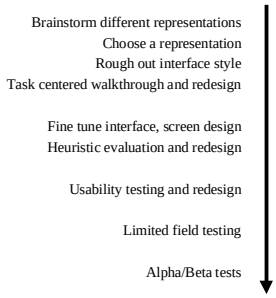
Prototype

- "an experimental incomplete design of an application used for testing design ideas"
- "until recently user interface designers spent very little time actually designing user interfaces because there were no tools which enabled them to explore design alternatives"
- can be used in any stage of development
- prototypes differ in the amount of functionality and performance they provide relative to the final product

Three main approaches:

- rapid or throw away prototyping
  - the prototype is build and tested and used to gain design knowledge to build the final product but the actual prototype is discarded.
- modular or incremental prototyping
  - new parts are added on as the design cycle progresses. The final product is built as separate components, one at a time.
- reusable or evolutionary prototyping
  - the prototype is not discarded and serves as the basis for the next iteration of design. The actual system is seen as evolving from a very limited initial version to its final release.

Prototyping lifecycle



Low fidelity prototypes

- "cheap" way of providing prototypes
- prototypes don't have to look like the actual interface you're testing, as long as they "work" the same
- advantage:
  - can get a lot of feedback about the interaction between the interface and the user
  - because it is cheap (money and time) you can afford to have more cycles of testing & prototypes
- disadvantage:
  - messier and harder to work with during evaluation
  - observations may not be as realistic

Medium fidelity prototypes

- Simulating or animating some but not all of the features of the intended system
- provide a sophisticated but limited scenario for the user to try out
- advantages:
  - engaging for end users
  - can test more subtle design issues
- disadvantages:
  - users are reluctant to challenge/change the design
  - management may think it is real
- Examples:
  - video
  - animation
  - wizard of oz

Wizard of Oz

- A human simulates the system intelligence and interacts with the user
- uses real or mock interface
- user uses the computer as expected
- "wizard" (sometime hidden)
  - interprets the subjects inputs
  - invokes the computer/screen to behave in an appropriate manner
- advantages:
  - adding simulated and complex vertical functionality
  - testing futuristic ideas

High fidelity prototypes

- prototype used for testing mimics the actual interface as closely as possible
- often software is used
- advantages:
  - the better the prototype the better the results
- disadvantages:
  - more costly and time consuming to create

Other categorizations of prototypes:

- Horizontal prototyping
  - covers a large breadth of features and functions, but most aren't working
  - good for testing breadth of scope but not actual use
- Vertical prototype
  - covers only a narrow slice of features and functions that do work
  - good for testing usage in a small portion of the product
- Chauffeured prototyping
  - user watches as the designer drives the prototype

Disadvantages

- Time
  - building prototypes takes time
  - if it is a throw-away prototype it can be seen as precious time taken away from the real design task
- planning
  - most project managers do not have the experience necessary for adequate planning and costing of a design process that includes prototyping
- non-functional features
  - difficult to prototypes some important features of a system such as safety, reliability and response time

Using video to prototype user interfaces

- Advantages:
  - can provide a broad range of visual expression (rough video sketches to believable video productions)
  - enable designers, clients, and end users to visualize the system early in the design process
  - can produce many design alternatives in a short amount of time
  - don't have to program computers
  - useful for demonstrating interfaces for technologies that don't exist yet
- Disadvantages:
  - video tools can be expensive
  - video is difficult to change or manipulate
  - may be difficult to simulate specific interactions
  - video can mislead people into believing that the prototype is the finished product
  - not interactive

Using video to prototype user interfaces

- Create a storybook or flipbook to help visualize the user interface interactions.
  - helps to work out timing and sequencing problems
  - includes:
    - what the screen would look like
    - how the user would manipulate the interface to accomplish a task
    - the response the computer would make to the user's input
  - may be difficult to interpret because they lack the continuity and transition from one drawing to the next
  - instead may use video to help visualize the interactivity in a more temporal medium

Animated drawings

- Create a simple sketch of the interface
- photocopy several copies of the sketch
- modify a series of sketches to illustrate the various interactions
- videotape each sketch for 10-20 seconds
- assemble using a video editor
- when the video is played it will give the illusion of motion
- advantages:
  - fairly simple
  - low cost
  - crude but effective representation
- disadvantages:
  - difficult to smoothly animate interaction effects

Cutout animation

- Objects are cut out of paper and placed on a background
- the objects are then filmed as they are moved under the video camera
- advatages:
  - smooth transitions such as moving or rotating an object are easy
  - fairly simple
  - low cost
- disadvantages:
  - other types of transitions are difficult to simulate
  - difficult to choreograph the placement of the cutout objects (retakes may be time consuming)

Animated objects:

- Build a physical model of the object
- use fishing line (which is transparent) to translate and rotate objects in space
- the camera can be moved throughout the space to give the illusion of walking through the model
- magnets can also be used to move objects

- advantages:
  - objects can be reused
  - may be faster than created computer generated models
- disadvantages:
  - difficult to simulate manipulations that cannot occur in physical space (scaling)