User Involvement in Design

Objectives

- Introduction to User Involvement
- Methods and Tools to support
  - User-Designer Cooperation
  - Generating Visions of Future Use
- Application of methods in a participatory design situation
- Prototyping
- Barriers to user involvement

User Involvement

2007: UK Government's record year of data loss
[Telegraph.co.uk]

- A record 37 million items of personal data went missing last year, new research reveals.
- Many losses were caused through CDs going missing in the post, laptop thefts, and inadequate security systems that failed to stop hackers reading information stored on computers
- The details lost included those of names, addresses, passports, bank and mortgage accounts, credit cards, hospital records, dates of birth, national insurance numbers, driving licences and telephone numbers.

→ Badly designed systems make it easy to make mistakes
User Involvement in Design

Not just in the UK...

Police in Germany published 41 reports on controlled drivers on the Web
- Details included: Name, address, date of birth, type of car, code plate and police record
- Cause: officer “pressed the wrong button”, Internet instead of Intranet
- Most likely reason: a badly designed system
- Effect: officer could loose job

→ Conclusion: Design systems together with users

Level of User Involvement

Tester: observed while trying out new designs or prototypes
Informant: comment on designs in interviews or focus groups
Design Partner: active member of design team

User – Designer Interactions

Degrees of Involvement and Implications
• Underlying worldview

• Participation implies
– Training (for both sides)
– Active cooperation (between the actual peers)
– Organisational commitment (to encourage staff)

User Involvement in Design

World view
How to create usable/useful systems…

• Use situation - how systems are used in the work context - is the fundamental starting point for design
• Systems should enhance skills
• Systems are a means to improve quality as well as efficiency
• Computer systems are tools to support work rather than to complicate things (restrict action)
• Participants have inherently conflicting interests

Contrasting Approaches
Shift to a more user-focused understanding…

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<th>Cooperative Approach</th>
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<td>Experience-based work</td>
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Example: Collaborative Systems
Which one is better?

Kongsberg Collaboration Room
(specialized oil platform monitoring/troubleshooting scenario)

MERL DiamondTouch
multi-user, touch and gesture control for small group collaboration

User Involvement in Design

Background

User Involvement is a loose term to summarize methods and tools from:

• User-Centred Design (Usability) → lectures on “Screen Design” (Sven)
• Ethnography (Ethnomethodology) → lecture on “Data Collection Methods” (Angela)
• Participatory Design (‘Scandinavian School’) • Contextual Design
User Involvement in Design

Methods and Tools for Involving Users

- **User-Designer cooperation**
  - Contextual Enquiry
  - Cooperative prototyping / mock-ups
  - Focus groups

- **Generating Visions of Future Use**
  - Future workshops
  - Organisational games
  - Metaphorical design


Contextual Enquiry (CE)
“field interview method”

- It allows users to explain their **work in context**, in their natural working environment.
  - Observe the work while it happens to gather detailed design data
  - filling out surveys or participating in a focus group removes the context.
- much of users’ work cannot explicitly be articulated (even by those who do the work)
  → you have to see it, to reveal all aspects of work practice

“The more complex the context, the more helpful is CE”

From: http://www.ischool.utexas.edu/~jpwms/pd/

User Involvement in Design

Contextual Enquiry (CE)

Go where the customer works…

• CE differs from standard interviews:
  – Look at use in practice (preserves context)
  – Focus on relationship between user & designer:
    Master (interviewee, user)
    Apprentice (interviewer, designer)
  – Acknowledge that the ‘Master’ is the expert

“Seeing the work reveals what matters.”


Contextual Enquiry (CE)

Set of principles

• **Context**, go to the customers’ workplace and watch them do their own work
• **Partnership**, talk to them about their work and engage them in uncovering unarticulated aspects of work
• **Interpretation**, develop a shared understanding with the customer about the aspects of work that matter
• **Focus**, direct the enquiry to talk about customers’ work that is relevant to the design

→ Guidelines to adapt to specific situations / contexts
→ To refine the simplified apprentice / master relationship

Contextual Enquiry

The contextual interview

→ Most of the time, this simplest form of CE is sufficient
  → Typically a contextual interview lasts 2 – 3 hours
  → Watch the customer do work (that the design team is also interested in)
  → From time to time interrupt and discuss aspects just performed work
  → Sometimes analyse artefacts in detail (paper & pencil, forms, notes)
  → Usually between 10 and 20 interviews like this are sufficient to define an area of work

“It’s all about context”

• Much information about how a task is done resides in the world – i.e. users often use context for subtle cues
• Losing the context means losing information about subtle motivations for conducting specific tasks
  • gather **ongoing** rather than summarized experience
  • gather **concrete** rather than abstract data
• Always ground the conversation in artefacts and events (even when talking about past events)

User Involvement in Design
**Contextual Enquiry**

**Partnership**

- Do not adopt a ‘host – guest’ relationship or a ‘expert-novice’ relationship, rather:
  - Be *nosy!* – ask for clarification and motivation
  - Alternate between *watching* and *probing*
  - Do *not* accept generalised statements, rather ask the user to perform the task
  - *Interrupt* for clarification – but also allow other *interruptions* that would otherwise occur – they can be valuable sources of information
  - Don’t be the *expert* – don’t help even if you know better – this reduces your chances for learning

**Contextual Enquiry**

**Interpretation**

- Conventional interviews separate data collection and interpretation – Contextual Enquiry combines them
  - Feed your interpretations back to the user
  - Ask for *confirmation, modification, rejection*
  - Be aware of non-verbal cues (user might not reject incorrect interpretations because they are too polite)
  - If you have instant design / redesign ideas ask for *comments*
- This builds a shared understanding and common vocabulary (*… and trust*)

**Contextual Enquiry**

**Focus**

- Focus reveals detail but conceals the unexpected
- It is important to set the focus appropriately
- Follow the user’s focus but drill deeper when:
  - You are surprised  
    (e.g. some user action seems wrong or incoherent)
  - The user contradicts herself
  - You don’t know something that the user takes for granted – admit and ask for clarification
  - The user does something you exactly expected

**The Process of Contextual Enquiry**

**Summary**

- Visit the user at the place of use
- Warm up with a standard interview
- Mark the transition from interview to Contextual Enquiry
- Start observing, probing, and commenting on ongoing work / usage of the system
- Wrap-up: *Feedback an overview on your interpretation – expect the user to correct and elaborate* – this is important!
**Future Workshop**

- **origin** - used for public to make contributions to matters of public concern (e.g. town planning)

- **objective** - take a group facing same problem situation who are interested in making some change and who have means to do so and enable them to develop a vision of a different way of working and a plan for achieving it


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**Future Workshop**

- **start with** - identified theme, cooperative participants (up to 20) and one or two facilitators

- **agree** - workshop setting

- **negotiate** – programme

- **proceed with** - three phases: Critique → Fantasy → Implementation

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**Future Workshop**

**Critique Phase**

- **objective** - to identify issues which change needs to address - problems at work

- **brainstorming on the theme**
  - usual brainstorming rules apply (short statements), high participation, no critical discussion, no justification

- **group statements into main issues**

- **small group discussions** - each group elaborating on one issue

- **plenary session**

**Example**

Brainstorming with Post-it notes

### Future Workshop

#### Fantasy Phase
- re-express critique phase statements positively
- use some activity for encouraging positive views of future - e.g. drawing or expressing visions of workplace in 3-5 years
  - same rule as brainstorming (no criticism)
  - nothing considered too radical / impractical / impossible
- rank/group/unify ideas
  - through small group discussions

#### Implementation Phase
- plenary to present outcomes from Fantasy Phase
- Evaluation: start to introduce practicality - consideration of what is needed to realise the ideas
- Plenary: to produce
  - an agreed common strategy
  - a detailed plan of tasks for individuals with timescales

### Risks
- Conflict within group - lack of agreement
- Running out of time for the workshop
- Loss of momentum afterwards
  - Plans not carried out
  - Disillusionment among participants

### Organisational Games

**Conditions:**
- Should allow participants to have an impact (participants need to feel taken seriously)
- Implementation should be likely (... so it is worth their time)
- Should be fun

*See: S. Bodker et al. in “Cooperative Design: Techniques and Experience From the Scandinavian Scene”, in the Baeker et al. collection - pp.215-224. (Paper supplied)*
Organisational Games

• Approach is borrowed from theatre
  – Playground (subjective interpretation of organisation/work)
  – Professional roles (formal requirements AND personal ambitions)
  – Situation Cards / Scenarios (examples of breakdown situations)
  – Commitments depending on Conditions are made
  – Action Plan for negotiations is formulated


Types of Prototypes

• Evolutionary: the prototype eventually becomes the product
• Revolutionary, or throwaway: the prototype is used to get the specifications right, then discarded
• High fidelity: resembles final product
• Low fidelity: just rough sketch - not close to final
• Horizontal prototype: broad but only top-level
• Vertical prototype: deep, but only some functions

From "User aspects of Software Systems" by Prof. Dr. O. De Troyer, 2004.

Prototyping in a Cooperative Design Context

Seeing a prototype as a boundary object:

developers → prototype ← users

...as embodiment of understanding/learning

Benefits:
  – Common Language (‘This should do that when I put it there’)  
  – Trial it in a Contextual Enquiry (rather than in an abstract discussion)

Techniques for Prototyping

• Storyboards
  – No computer resources required
  – Paper and pencil
  – Drawing tool
  – Presentation package
• Simulations
  – Limited functionality
  – Prototyping tools (e.g. HyperCard)
• High level programming

From "User aspects of Software Systems" by Prof. Dr. O. De Troyer, 2004.
Putting Tools and Methods Together
An Example

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<tr>
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<th>Future Workshop</th>
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<th>Mock-up designs</th>
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<tr>
<td>workplace visits, interviews, demonstrations</td>
<td>illustrative mock-ups prototypes, scenarios</td>
<td>cooperative prototypes</td>
<td></td>
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</table>

users learn about new technology

definitions

Focus is on:
normal activities, exceptions, problems

IDEAS, PROBLEMS FOR FOCUS -> CURRENT ROLES CHANGED ROLES ACTION PLAN IDEAS ARE EMBODIED

Barriers to User Involvement
Conflicting ‘Worldview’

Conflicting views regarding:
– The role and function of designers (. . . in society)
– Perspective on ‘work’
– Consultant/contractor constraints
  • Actors may be placed in situations that preclude User Involvement

If user involvement in design is so good, why isn’t it used more often?

Barriers for Organisation

• in a company developing products:
  – major restructuring of the design process
    • conventional emphasis is on features
    • users consulted about form
  – issues of confidentiality
  – different staff skills needed

• lack of contact (and respect) between specialist mediators (with users) and designers
• unwillingness to invest resources
• difficulty in establishing useful user contacts

Barriers for Designers

• reliance on intuition (think they know what is needed)
• reliance on own experiences (selves as users)
• reliance on indirect information
  – surveys, others’ experiences, other products, consultants, user groups, marketing information
• exclusive use of knowledge of shared characteristics
  – i.e. human factors
• lack of empathy towards non-technical people

The example is adapted from the one described by S. Bodker et al. in “Cooperative Design: Techniques and Experience From the Scandinavian Scene”, in the Baeker et al. collection – pp. 215-224. (Paper supplied)
Barriers for Designers (cont.)

- little appreciation of different work situations
- no direct channels to users
- may introduce dissatisfaction / fear / threat
- too many users - may disagree
- too few users - may not be representative
- time required to collaborate and take note of feedback

Barriers for Users

- need for ‘time off’ to participate
  - tendency to involve users indirectly say via IS ‘specialists’ or some other representatives
- direct channel to developers not available
- users are too busy (so avoid engagement)
- interest fades in long development projects
- no perceived personal gain or advantage
- sense of threat e.g. to jobs

Barriers for Users (cont.)

- difficulty in communicating with designers
- designers (developers) may be difficult to identify
  - team will vary over time as personnel and specialised groups make their contributions
  - responsibilities are divided

Resources

- Shneiderman, “Designing the user interface”, chapter 3.6
- Participatory Design (Patrick Williams) http://www.ischool.utexas.edu/~ipwms/pd/
- Example of two organisational games: http://www.cwrl.utexas.edu/~spinuzzi/2003spring/rhe330c/project2_examples.html
User Involvement in Design

Example: A Participatory Design Project
1. Phase: Learn about the work

Participatory Design Project Timeline

- Roles of Designer: Coordination
- Researchers learn about work through observation, interview, and demonstration

From: http://www.ischool.utexas.edu/~jpwms/pd/

Example: A Participatory Design Project
2. Phase: Future Workshop

Participatory Design Project Timeline

- Roles of Designer: Facilitation
- Problems and ideas compiled in Future Workshop

From: http://www.ischool.utexas.edu/~jpwms/pd/

Example: A Participatory Design Project
3. Phase: Organizational Games

Participatory Design Project Timeline

- Roles of Designer: Materials preparation
- Organizational games investigate roles and commitments, illustrated through mock-ups, prototypes, and action plan

From: http://www.ischool.utexas.edu/~jpwms/pd/

Example: A Participatory Design Project
4. Phase: Embodying Ideas

Participatory Design Project Timeline

- Roles of Designer: Social Engineering
- Embodying ideas though continued cooperative design of selected prototypes, testing

From: http://www.ischool.utexas.edu/~jpwms/pd/