User-centered approaches to interaction design

Overview

- Why involve users at all?
- What is a user-centered approach?
- Understanding users' work
  - —Coherence
  - —Contextual Design
- Involving users in design
  - —PICTIVE
  - —CARD

Why involve users at all?

- Expectation management
  - Realistic expectations
  - No surprises, no disappointments
  - Timely training
  - Communication, but no hype
- Ownership
  - Make the users active stakeholders
  - More likely to forgive or accept problems
  - Can make a big difference to acceptance and success of product

Degrees of user involvement

- Member of the design team
  - — Full time: constant input, but lose touch with users
  - — Part time: patchy input, and very stressful
  - — Short term: inconsistent across project life
  - — Long term: consistent, but lose touch with users
- Newsletters and other dissemination devices
  - — Reach wider selection of users
  - — Need communication both ways
- Combination of these approaches

How Microsoft involves users

Users are involved throughout development

- ‘activity-based planning’: studying what users do to achieve a certain activity (task)
- usability tests e.g. Office 4.0 over 8000 hours of usability testing.
- internal use by Microsoft staff
- customer support lines

What is a user-centered approach?

User-centered approach is based on:

- Early focus on users and tasks: directly studying cognitive, behavioral, anthropomorphic & attitudinal characteristics
- Empirical measurement: users’ reactions and performance to scenarios, manuals, simulations & prototypes are observed, recorded and analysed
- Iterative design: when problems are found in user testing, fix them and carry out more tests

Early focus on users and tasks

- Users’ tasks and goals are the driving force behind the development
- Users’ behavior and context of use are studied and the product is designed to support them
- Users’ characteristics are captured & designed for
- Users are consulted throughout development, from earliest phases to the latest, and their input is seriously taken into account
- All design decisions are taken within the context of the user, their work and their environment

Understanding users’ work

- Understanding users’ work is significant
- Ethnography:
  - from anthropology
    - ‘writing the culture’
    - participant observation
- Difficult to use the output of ethnography in design

Framework for using ethnography in design

- *Distributed co-ordination*: distributed nature of the tasks & activities, and the means and mechanisms by which they are co-ordinated
- *Plans and procedures*: organisational support for the work, such as workflow models and organisational charts, and how these are used to support the work
- *Awareness of work*: how people keep themselves aware of others' work

Coherence

- A method which offers appropriate questions to help address these key dimensions
- For example:

—Distributed Coordination: How is the division of labor manifest through the work of individuals and its co-ordination with others?

—Plans and procedures: How do plans and procedures function in the workplace?

Contextual Design

- Developed to handle data collection and analysis from fieldwork for developing a software-based product
- Used quite widely commercially
- Contextual Design has seven parts:

  Contextual inquiry, Work modelling,
  Consolidation, Work redesign,
  User environment design,
  Mock-up and test with customers,
  Putting it into Practice

Contextual Inquiry

- An approach to ethnographic study where user is expert, designer is apprentice
- A form of interview, but
  - —at users' workplace (workstation)
  - —2 to 3 hours long
- Four main principles:
  - —Context: see workplace & what happens
  - —Partnership: user and developer collaborate
  - —Interpretation: observations interpreted by user and developer together
  - —Focus: project focus to help understand what to look for

Work Modeling

In interpretation session, models are drawn from the observations:

- **Work flow model:** the people, communication and co-ordination
- **Sequence model**: detailed work steps to achieve a goal
- **Artifact model:** the physical 'things' created to do the work
- **Cultural model:** constraints on the system from organizational culture
- **Physical model:** physical structure of the work, e.g. office layout

Consolidation

- Each contextual inquiry (one for each user/developer pair) results in a set of models
- These need to be consolidated into one view of 'the work'
- Affinity diagram
  - —Organizes interpretation session notes into common structures and themes
  - —Categories arise from the data
  - —Diagram is built through induction
- Work models consolidated into one of each type

Participatory Design

- Scandinavian history
- Emphasises social and organisational aspects
- Based on study, model-building and analysis

of new and potential future systems

Participatory Design (contd)

- Aspects to user involvement include
  - —Who will represent the user community? Interaction may need to be assisted by a facilitator
  - —Shared representations
  - —Co-design using simple tools such as paper or video scenarios
  - —Designers and users communicate about proposed designs
  - —Cooperative evaluation such as assessment of prototypes

Benefits of Participatory Design

"Computer-based systems that are poorly suited to how people actually work impose cost not only on the organisation in terms of low productivity but also on the people who work with them. Studies of work in computer-intensive workplaces have pointed to a host of serious problems that can be caused by job design that is insensitive to the nature of the work being performed, or to the needs of human beings in an automated workplace."

[Kuhn, S. in *Bringing Design to Software*, 1996]

PICTIVE

- Plastic Interface for Collaborative Technology Initiatives through Video Exploration

- Intended to empower users to act a full participants in design

PICTIVE (contd)

- Materials used are:
  - —Low-fidelity office items such as pens, paper, sticky notes
  - —Collection of (plastic) design objects for screen and window layouts

- Equipment required:
  - —Shared design surface, e.g. table
  - —Video recording equipment

PICTIVE (contd)

- Before a PICTIVE session:
  - —Users generate scenarios of use
  - —Developers produce design elements for the design session

- A PICTIVE session has four parts:
  - —Stakeholders all introduce themselves
  - —Brief tutorials about areas represented in the session (optional)
  - —Brainstorming of ideas for the design
  - —Walkthrough of the design and summary of decisions made

CARD

•Collaborative Analysis of Requirements & Design
•Similar to PICTIVE but at a higher level of abstraction: explores work flow not detailed screen design
•Uses playing cards with pictures of computers and screen dumps
•Similar structure to the session as for PICTIVE
•PICTIVE and CARD can be used together to give complementary views of a design

Summary

- User involvement helps manage users' expectations & feelings of ownership
- A user-centered approach has three main elements: early focus on users, empirical measurement and iterative design
- Ethnography is useful for understanding work, but can be difficult to use in design
- Coherence and Contextual Design support the use of ethnographic data in design
- Participative design involves users taking an active part in design decisions
- CARD and PICTIVE are example techniques

Exercise

This exercise is to be done in pairs.

Consider a website application for booking theatre or cinema tickets online

(a) Think about how you would design such a site, and sketch out some ideas

(b) Run a CARD session with a colleague acting as a 'user' to map out the functional flow of the website

(c) Ask your colleague to produce some scenarios of how the system may be used. Meanwhile, prepare some 'empty' templates for a PICTIVE session for this system, using paper, sticky notes and pens

(d) Run a PICTIVE session to develop the online booking system collaboratively, using PICTIVE.