

Design-based research in a small software company: Tools for creating and analyzing sustainable intervention

Anders Mørch, Anne Moen, Kathrine Nygård, Sten Ludvigsen
InterMedia, University of Oslo, Norway

Outline

- KIKK project (case in KP-Lab)
- Design-based research
- Constrains and opportunities of workplaces
- Design approach
 - Participatory design
 - KP-Lab design principles
- Theoretical approach
 - Activity theory
- Empirical examples

KIKK project

- KIKK (Norwegian acronym: Knowledge management for internal communication and customer relations)
- *Goal:* Understanding knowledge practices in a small, technology-rich company (producing software for project management in the oil/gas/building industry)
- *Understand:* what are the components of knowledge practices in this case (e.g. subjects, AT objects, knowledge, skills, ICT tools, division of labor) and what interdependencies exist among them?
- How will knowledge practices change a result of new technology introduction and everyday business operations (e.g. outsourcing, merger, take over) and what is driving changes (what subjects in the company, what tools, rules, objects, etc.), and how does this change in driver components impact other (dependent) components

Design-Based Research

- Partnerships among researchers and educators with the goals of conducting rigorous and reflective inquiry in classrooms,
- Also referred to as design experiments (Brown 1992; Collins, 1992)
- Testing and refining innovative learning environments, and
- Defining new design principles based on previous research

Workplace constraints and opportunities for “DBR”

- Educators are replaced by HR management
- (-) Primary activity in workplace is work (to support a business) and not teaching and learning as in educational institutions
- (+) Provides opportunities for longitudinal research (beyond short term design experiments)
- (+/-) In-house support for software engineering (IT division of company)

Design approach

- Two types of evolving artifacts:
 - Project planning tool (that the company sells)
 - Web portal/CRM
- KP-Lab design principles to guide the design and evaluation of technology
- Participatory design
 - User participation
 - In product evolution of project planning tool
 - In designing the new web portal
- Users as champions to sustain the designs outside the project
- Role of research team
 - Advisors in the socio-technical set up
 - Participated in the technical design

Theoretical approach

- A socio-cultural perspective
 - Mediation by signs and symbols and tools (Vygotsky, 1986)
- An Activity-theory approach
 - Activity as the central unit of analysis (Engeström, 1989, 1999)
 - Helps to the structure analysis
 - Object of activity
 - Tools, rules and division of labor
 - Boundary crossing two activity systems (developers and customers)
- Shared objects
 - Mediating between activity systems
- Boundary objects
 - Tools that are shared across activity systems

Methods

- Case design: Observations, interviews
- Collecting data using audio and video

Techniques for user involvement

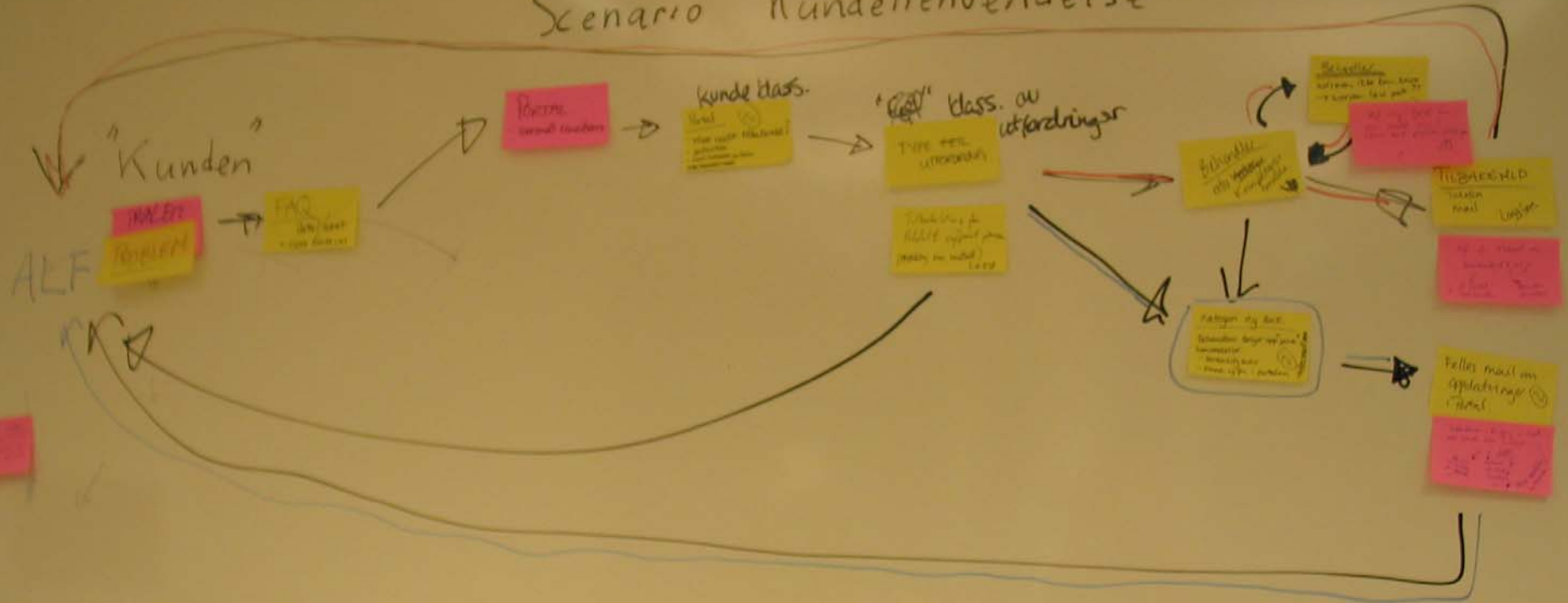
- Project meetings, interviews and observations
- Design workshops
- Feedback on findings

Design workshops

- Three stages (Kensing and Madsen, 1991)
 - Critique
 - Fantasy
 - Implementation
- Role playing
- Scenario development of new customer interaction support



Scenario Kundehenvendelse



Kjætt ä vite

The activity as unit of analysis

- Understanding the company as one Activity-system, interacting with others (customers) through Boundary-crossing
- Following the object of activity
 - Key object: To develop and sell the company's products

Boundary crossing – empirical findings

- Product evolution
 - Customer improvement request in interaction with product developers
- Mentoring new employees on customer site
- Designing a new web-portal for customer interaction
 - Interaction with researchers

How is this related to trialogical learning and the third metaphor?

- It takes as starting point the participation metaphor (dialogic approach)
- It adds to this the notion of tool development and evolution (concrete artifacts)
 - Project planning tools, Web portal
- Involving multiple activity systems in analysis
 - Developers, customers, researchers
- It draws on “trialogical notions” from Activity theory such as shared objects of activity