

Designing for Accountability in the Age of Big Data



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Blekinge Institute of Technology

- with a profile in applied IT and innovation for sustainable growth

Engineering, game development, media technology, spatial planning, interaction design + nursing education




BIG DATA is a hot topic at BTH, where there is a large on-going research project on Big Data and where the first engineering education in Data Science in Sweden will be starting in 2018



Outline of the presentation

People, Computers and Work

Human Work Science and Informatics 

The Scandinavian Tradition of Participatory Design

"From human factors to human actors"

The Health in Hand project

A shift of focus from mainly patient-centered design
to include employees' wellbeing

Designing for accountability

People Computers and Work



MDA – People Computers and Work was an interdisciplinary educational bachelor's and master's program offered at BTH 1995 - 2005

The program combined education in Human Work Science and Computer Science and included ethnomethodology and ethnographic field studies in work places

Inspired by a large national research project focusing on how computers in the work place were affecting employees, jobs and work life

Human Work Science and Informatics

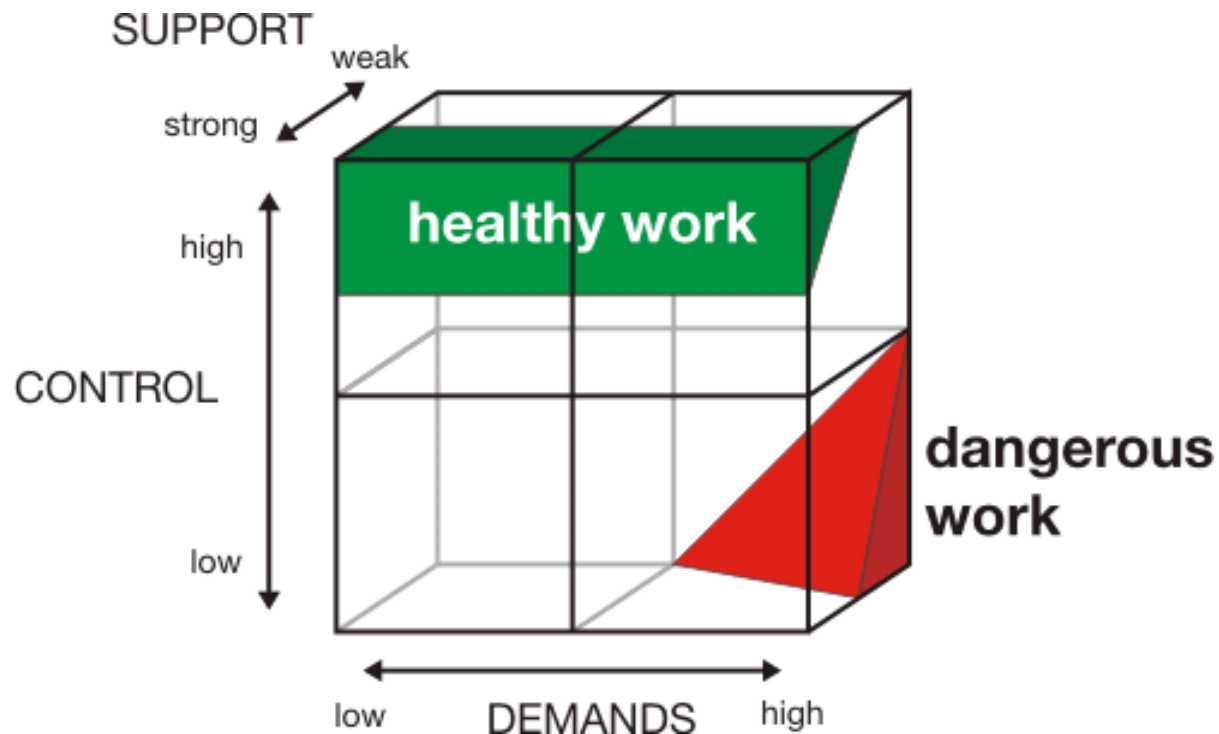
Three branches of Human Work Science in Sweden:

1. Healthy work, e.g. ergonomics and occupational health
2. Skill and Technology (addressing threats of deskilling of jobs)
3. Work Practice

Informatics (also called Information Systems or IS) – in Scandinavia understood as an interdisciplinary discipline including both social sciences and computer science, and since the 1970:ies strongly influenced by “The Scandinavian tradition of Participatory Design”

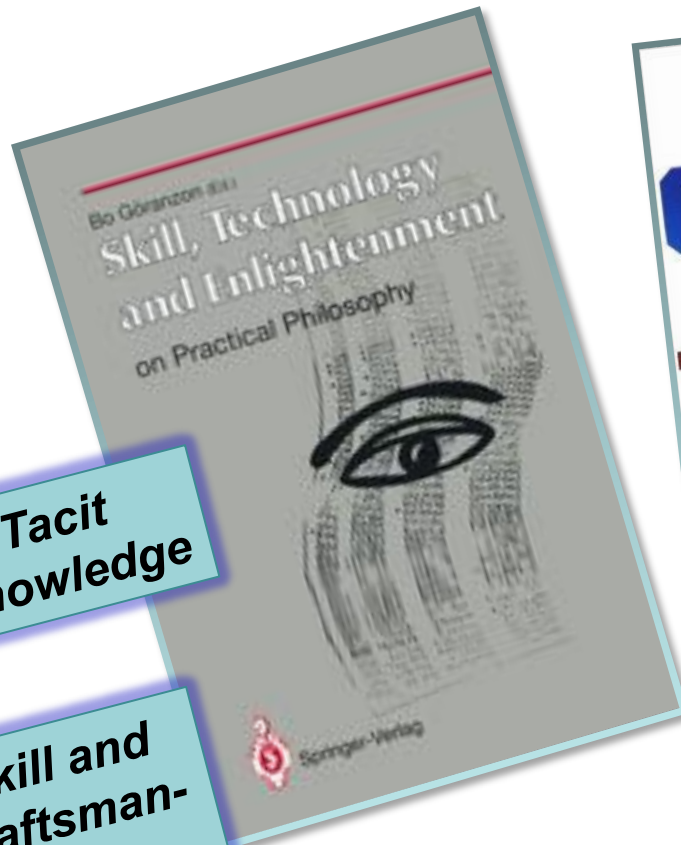
Healthy work

Karasek's control-demand model describes the relationship between stress levels and work-related stress factors (Karasek & Theorell 1992):



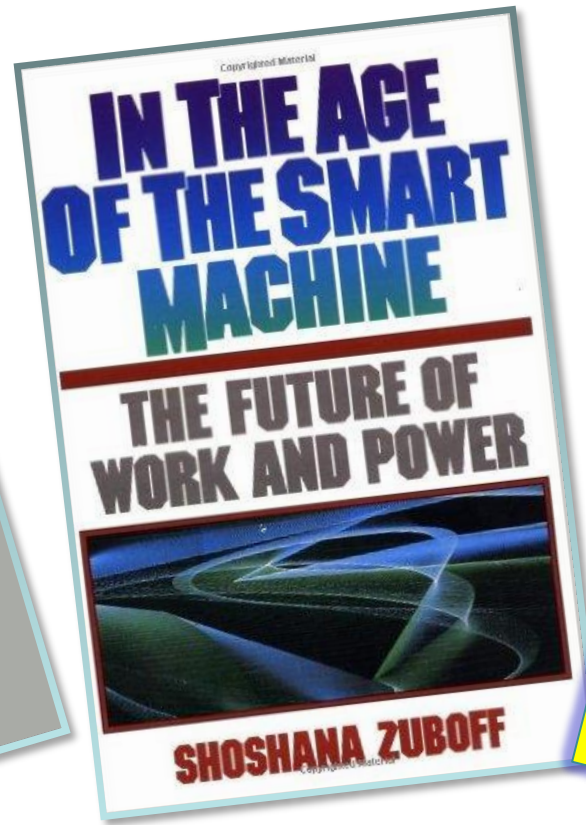
[Source of this version of the model: <http://www.it.uu.se/edu/course/homepage/hcinet/vt08p4/lectures/lecture7>]

Skill and Technology



Tacit Knowledge

Skill and craftsmanship



Automate / Informate

The Information Panopticon – a daily routine of surveillance

Based on ten years' (1978-1988) studies of computerization of the work place.

Work Practice

Ethnomethodologically inspired ethnographic field studies of work practice (as opposed to for instance work flow studies)

Computer Supported Collaborative Work (CSCW)

Critique of the *planning model* of human action as a basis for designing for human-computer interaction (Suchman 1987)

Participatory design of technology as a way of gaining a richer understanding of work practice (compare Zuboff's concept of the "informating" potential of computers)

The Scandinavian Tradition of Participatory Design

Exploring Practices of User Involvement in design and development of e-health services

UCD

PD

UDI



User Centered Design

Participatory Design

User Driven Design

From Human Factors...

...to Human Actors



Indo-Swedish R&D project focusing on mobile technologies for health promotion and disease prevention



Swedish test app version 1 (spring 2015)

This is how it works:



Blood glucose meter

The diasend app

The diasend data base

What we saw in the Swedish case study:

- Lack of integration of different IT systems in use
- Lack of knowledge/know-how about IT systems in use
- Insufficient IT support (above all outside of normal office hours)
- Constantly on-going **work-arounds** to make things work *despite* the technology, i.e. IT is making a stressful work situation worse
- Insufficient support for communication and thus lack of access to necessary and timely information for efficient healthcare delivery



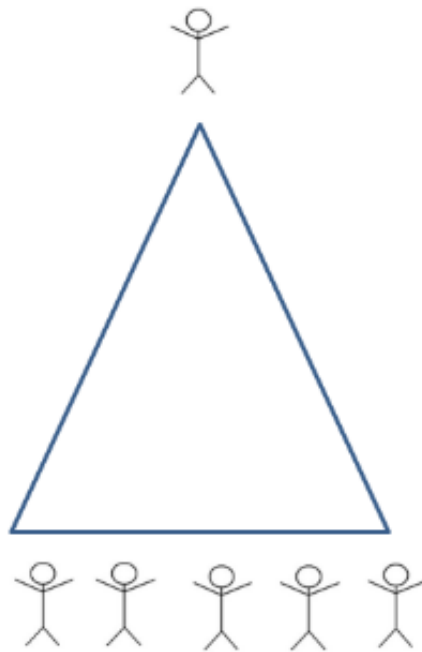
Conclusion: we had to shift focus and apply **2 parallel approaches**:

1. **High-lighting usability of IT as a strategic resource** in healthcare organizations (making IT accountable to local work practices)
2. **User-centered design** for development of support for communication and collaboration both within the workplace and with patients and next-of-kin

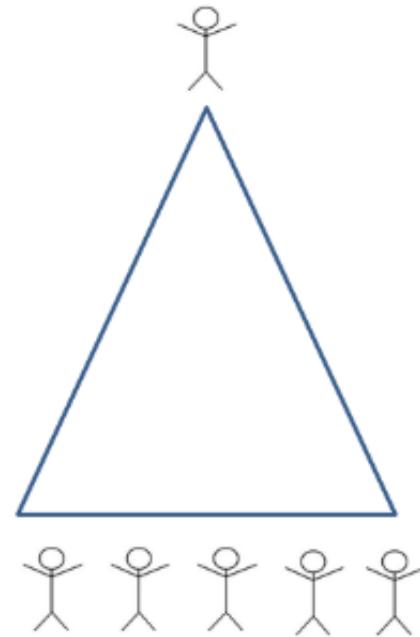
Designing for Accountability

- **Ethnomethodology** – the study of methods people use for understanding and producing the social order in which they live (Garfinkel 1984; also in line with the later philosophy of Wittgenstein)
- **Accountability**, as studied in ethnomethodology, refers to shared understanding of members of a social setting concerning what makes sense in that setting and context
- Traditionally, information systems have been designed for supporting administrative accountability in work organizations
- In recent years, also a number of computer scientists have begun to argue for the need of designing technology that is accountable to the user/s (Dourish 2004)
- Modern information and communication technology has potential to be designed to support accountability in local work practice

Rethinking health information systems

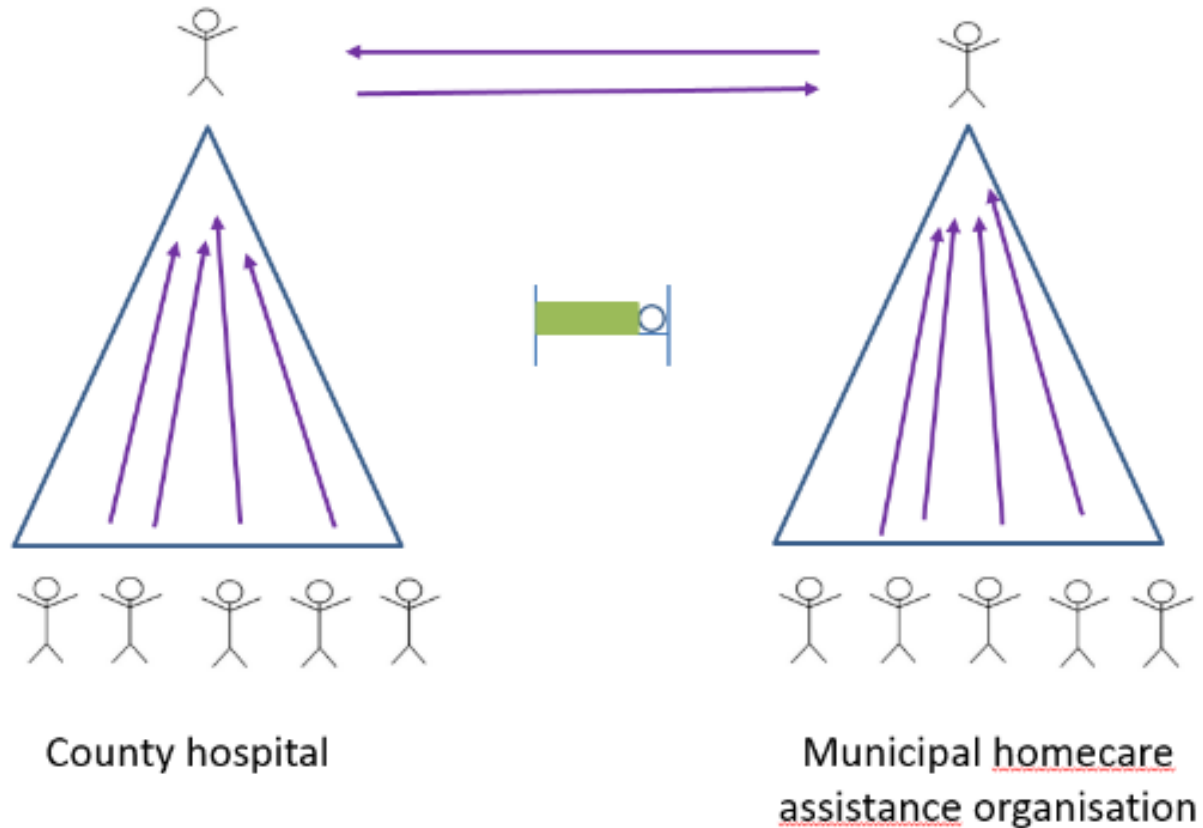


County hospital

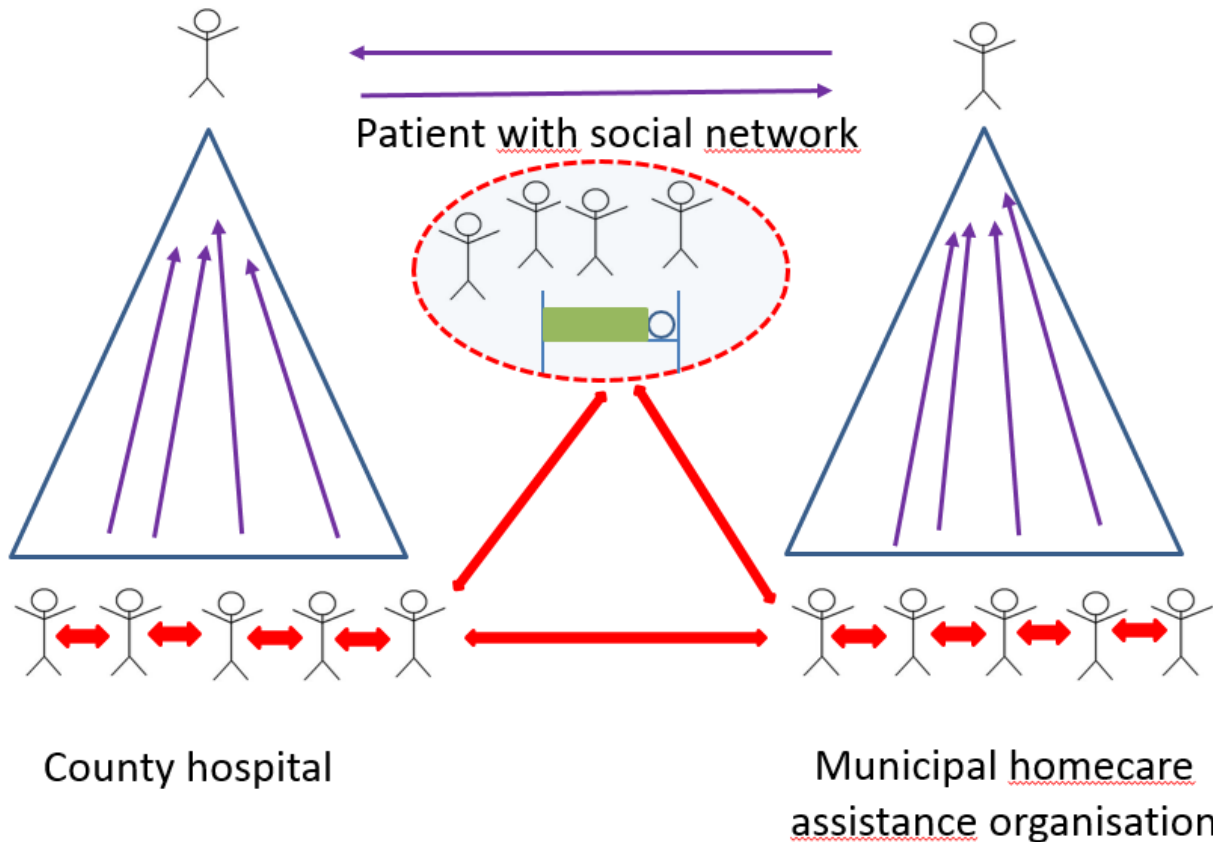


Municipal homecare
assistance organisation

From support for administration



To support for communication and collaboration in everyday life/work



Mockup developed by the healthcare team

"Like in the departure lounge of a modern airport" – support for efficient logistics and staff teamwork

Today's patients:

- *Here, waiting*
- *Not here yet*
- *Cancelled appointment*



Planned-for staff on duty today:

- *Here*
- *Busy*
- *Sick*

Speedy shortcuts to the systems most frequently used by this team

The **mockup** developed in collaboration with the diabetes team at the county council hospital in Blekinge indicates that what the team requires is **mobile support for communication and collaboration** which **high-lights and brings to the fore the most essential, timely information** in and for the work place/everyday work practice.

Future work

- How does Big Data fit in to the picture when designing for accountability?
- Could Zuboff's central concepts concerning "the Smart Machine" be revisited and reconsidered in this context, using a participatory design approach with healthcare employees and patients:
 - Automate
 - Informate
 - The Information Panopticon

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