



# A Practice-oriented Approach to Participatory Design

Designing Health Information Systems for Healthcare Networks

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# Index

- Introduction
- Result
- Discussion
  - Participatory design
  - Practice-based approaches
  - The theory of practice architecture
  - Contribution of practice-based approaches to mitigate PD challenges
- Conclusion and future work

# Introduction

- Too many HIS (Health Information Systems) fails when introduced because of users (Health Care Professionals) resistance as a main contributing factor
- To support users' needs are commonly the reason for designing new systems, so why is it that the final solution fails to be accepted?
- Probably many reasons, but the most common is:
  - Physical distance between developers and healthcare professionals
    - They often do not work together
  - Distance in time between requirements and final solution
    - Needs and requirements can change during a project, especially for big systems and long time span
  - Distance in viewpoint
    - Designers often know much about future possibilities, but don't necessarily understand healthcare professionals' needs.
    - Healthcare professionals are oriented towards current situations and frustrations. They act, think, create new ideas and requirements about future solutions based on their current work.

# Design – user involvement

One definition of design:

“a concerned social and historical activity in which artifacts and their use are anticipated; an activity and a form of knowledge that is both planned and creative, and that **deals with the contradiction between tradition and transcendence**” (Ehn 1988)

- In order to design a future work situation, we need to understand users current work situation.
- We can ask the users, but do we always get the correct answer?
  - Sometimes knowledge, values and needs are hidden for the users. Their work are automated and embedded, thus they are not aware of it or they consider it not necessary to mention.
  - Sometimes users are aware of their needs but have problems articulating them.
- Active user involvement is suggested as an approach for narrowing the distance between needs and solutions
  - One such approach is Participatory Design (PD), with a special focus on revealing tacit knowledge by actively involve users as Co-designers throughout the whole design process.

*P. Ehn, “Work-oriented design of computer artifacts,” Arbetslivscentrum, 1988.*

# Valkyrie – designing a HIS for a healthcare network

The aim of Valkyrie is to promote healthcare service coordination for patient-centric care across providers and healthcare levels (hospitals, municipalities, General Practitioner) by:

- Collecting , coordinating, and presenting health data records from several heterogeneous Electronic Health Record (EHR) systems as a coordinated, standardized, virtual electronic health record system.

We expect to uncover conflicting needs among providers and practitioners during this project. Thus, active user involvement in the design process is crucial for the success of this project.

- To meet these challenges and to avoid user resistance with the final solution, we decided to use the PD approach.

While PD is a way to discover local needs and hidden knowledge during design, it has some weaknesses when trying to broaden the learning from local settings to a broader healthcare network.

- We wanted to investigate how to expand PD with practice-based approaches in order to broaden the learning across healthcare providers and administrative levels.

## Result

- We conducted a brief literature search in Scopus and Google Scholar, and screened titles and abstract, looking for research that combined PD with Practice-based approaches.
- The literature search did not show any significant use of PD in combination with practice-based approaches.
- The search resulted in one paper we decided to include (Bjørn and Østerlund 2014). This paper attempts to bridge ethnography with design research (Sociomaterial-Design), including PD, for the healthcare domain.
- The discussion (next part) looks at some known weaknesses in PD and elaborates on how practice-based approaches can mitigate some of these challenges.

# Participatory Design (PD)

- The basic idea of PD is that involving workers as Co-designers of their future work can promote:
  - Empowered workers
  - Build competencies
  - Stimulate to meaningful work

→ Thus, PD can increase their work satisfaction, which indirectly may benefit companies as well
- PD with its techniques (Prototyping, Personas, Future workshops etc.) attempts to mimic future work situations and/or future information system during the design phase.
  - This refinement process evolve gradually in an agile, iteratively manner making the final solution more aligned with users expectations and work practices.
  - Such an approach can reduce unnecessary functionality and increase attention on reveling tacit needs and knowledge early.

→ Thus, PD can reduce the risk for complex changes, frustrated users and cost increases later on.

# Some challenges with PD in a healthcare network

- Argumentation out of self interest
  - Democratization of work, for instance, entails that each participant's voice is equally valued, even those that offend others or argue out of self-interest.
- Environment for mutual learning
  - How to enable enough space for understanding (for the designers) when activities that directly engage participants in the design are in the foreground?
- Involving the suitable candidates as participants in the Co-design
  - Future and design oriented candidates that also are able to translate between work practices and future design
- Broadening the learning and understanding process from one particular site to a design of HIS that is perceived valuable and accepted by practitioners in a healthcare network
  - With growth in providers and practitioners, variances in work practices and needs are likely to increase
  - Finding participants that can look beyond their own work are essential
  - This also calls for the attention to differences in organizational structures, such as roles, regulations, hierarchies and power relations, internally and across providers



# Practice-based approaches

- Practice-based approaches do not follow a single, unified theory.
  - They all have in common that practices, not individuals or practitioners, are the basic unit of analysis for understanding organizational phenomena
  - They usually follow Schatzki's site ontology, stating that practices consist of language (sayings) and activities (doings), always situated within a site or sites
  - They make contextual factors more tangible through materiality and other arrangements
- One practice-based approach that expands on Schatzki's site ontology and makes power and politics (Relatings) explicit, together with language (Sayings) and activities (Doings) is the Theory of Practices Architecture.
  - Power and politics are important dimensions in healthcare and especially in a healthcare network which we have as focus in Valkyrie.

# The theory of practice architecture

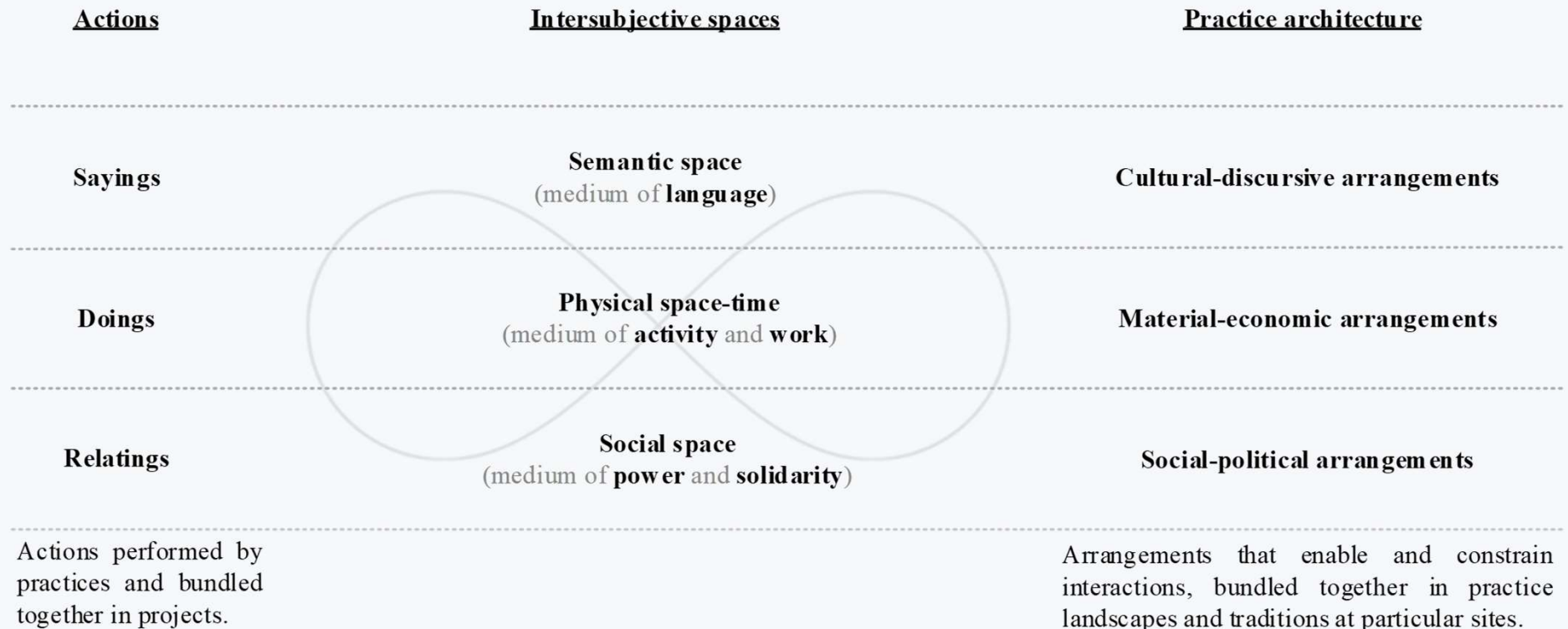


Figure 1. A simplified illustration of the theory of practice architectures (Mahon, Francisco, Kemmis 2017)

## The Theory of Practice Architecture cont.

- Through the theory of practice architecture, context emerges in the foreground and becomes tangible through the practice architecture consisting of three interconnected arrangements, cultural-discursive, material-economic and social-political.
- The practice architecture are the preconditions, traditions, constraints and enablement of the practices, by occurring in or brought to a particular site
- Transformation of practices' actions can also occur by bringing in new arrangements or creating new arrangements at the site, which can promote change.



## How practice-based approaches can mitigate the challenges of PD

	PD	Practice-based approaches
<b>Arguments out of self interest</b>	No technique applicable	Can help abstract perspectives and discussions from individual standpoint to a practice viewpoint
<b>Selection of practitioners as co-designers</b>	Stakeholder analysis	Can give additional support to stakeholder analysis by finding relevant stakeholders based on practices and relations, both direct and indirect, across space and time
	No technique to choose the right individual candidates	No technique to choose the right individual candidates
<b>Establishing an environment for mutual learning</b>	Ethnography is in use for a deeper understanding early, while different PD techniques are applicable during design	Sociomaterial-Design attempts to bridge understanding and learning with design and change
<b>Broadening the learning from local site to a healthcare network</b>	Make sure to have representatives from different sites as co-designers and test the prototypes at different sites during development	Results of the mutual shaping of practices and practice architecture (relations) can be used to understand how variances between sites have emerged and what to consider in the design for a healthcare network
		The theory of practice architecture can help to study how power and politics together with language and activities are performed, which can help to plan and design a HIS for several providers and care levels (a healthcare network).

## Conclusion and future work

- Practice-oriented approaches can contribute with a vocabulary and a study approach that can help inform the design process.
- They can also help to identify actual empirical connections between practices and arrangements to interpret and explain practice variation across providers.
- The theory of practice architecture provides a framework for understanding practices' actions through language, activities, power, and politics. The latter two being relevant for healthcare and essential to move the design from local sites to broader healthcare networks.
- This paper contributes to:
  - practice-oriented approaches in technology design by adding the dimension of power and politics
  - the ongoing discussions in the research community on how to evolve PD to meet future needs of ubiquitous healthcare data in patient-centric healthcare.
- In the Valkyrie project we will further explore how practice-based approaches can contribute to mitigating the challenges of PD.

**Thank you for your attention!**



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