THINKING ABOUT EVALUATION OF INFORMATION SYSTEMS THAT MAKES WORK WORK

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Abstract

The aim in this paper has been to elaborate on the sociomaterial view of the IT artefact. A further purpose is to investigate if the sociomaterial perspective could serve as a theoretical foundation for conceptualising the information system as evaluation object in an interpretive approach for evaluation. The investigation take a conceptualisation of a social work information system, developed on basis of empirical work, as starting point. Several premises in the sociomaterial view match the premises in the empirical conceptualisation. A further analysis identifies several problems with using a sociomaterial view in combination with a practice perspective. The analysis elaborate on the question of theoretical grounding of conceptualisation of the information system in the context of evaluation, alternative ways to proceed are suggested.

Keywords: IT artefact, Conceptualisation, Sociomateriality, Practice, Evaluation

1 Introduction

The need for evaluating information systems is evident when recognising that information systems and information technology is everywhere in the world of practice. Evaluation is a process designed for generating knowledge about information systems. In organisational settings individual work is, to a large extent, performed through information systems and organisational performance heavily relies on their backbone of information systems. But technology’s central role in organisational affairs and the character of the IT artefact is largely understudied (Orlikowski 2008, 2001). How then to perform beneficial evaluations of information systems if information systems role and character are not clearly understood.

In an evaluation of an information system the information system artefact is an evaluation object. Researchers interest for theorising and conceptualising the information system artefact has grown in recent years, not least against the backdrop of the design science and action research discussion in the IS field. Orla

Orlikowski and Iacono (2001) and later Orlikowski and Scott (2008) criticises IS and organisational researchers for that their conceptualisations of IT artefacts are taken-for-granted, assumed unproblematic and recognised as stable, discrete and independent entities. They mean that this simplified view of the IT artefact is problematic and hinder researchers to take responsibility for influencing on what future that is enacted and that researchers need to take IT artefacts seriously and increase attention to explicitly addressing and theorising the IT artefacts central in our studies (Orlikowski and Iacono 2001).

The discussion of the conceptualisation of the IT artefact is important for procedures, results and outcomes of evaluations of information systems. The conceptualisation deal with what that is evaluated and how we perceive the evaluation object and have consequences both for the procedure as well as for the purpose of evaluation.
Evaluation research has developed as a field from the need of evaluating public programs of social change (within schools, health-care, and welfare enterprises) in order to show if services and improvement efforts were succeeding (Stufflebeam 2001). Since late 1950s several evaluation movements is recognized as consequences of evaluators and researchers working to solve problems of their time. A first science-driven wave developed methods in support for establishing more rational public decision-making bodies (Vedung 2010). With a scientific orientation evaluation is neutral, objective research fitting a goal based model of evaluation finding the most efficient means to reach externally set goals. Towards late 1970s faith in experimental evaluation faded and the understanding for including information elicited from users, operators, managers and other stakeholders brought about a more democratic or dialog oriented model for evaluation (Vedung 2010). According to Guba and Lincoln (2001) evaluation is one form of disciplined inquiry; evaluation focus some evaluation object and results in “merit” or “worth” constructions, i.e. judgements, about it, where merits consider intrinsic qualities of the object irrespectively the application setting and worth regards extrinsic usefulness in a concrete setting. It seems to be generally agreed upon that a definition of evaluation must cover a broad range of systematic thinking where social betterment and improvement of social conditions lies behind the widespread purposes of evaluation (Henry and Mark 2003). Evaluation results should be used to inform decision making in order to improve the social conditions involving the evaluation object under study.

The investigation takes an empirical conceptualisation of a social work information system as starting point (section 4, figure 1) searching for a proper theoretical foundation. The sociomaterial view is a possible theoretical base for the empirical conceptualisation. In next section the sociomaterial view of the IT artefact suggested by Orlikowski and Iacono (2001) and Orlikowski and Scott (2008) is discussed. In section 4 premises of sociomateriality are compared with the empirical conceptualisation. Preliminary problems are identified with using a sociomaterial view in combination with a practice perspective (section 5). In section 6 alternative ways to proceed with the theoretical grounding of the empirical conceptualisation are identified.

2 Conceptualising the IT artefact

Investigating 188 research papers in the Information Systems Journal (1990-99) Orlikowski and Iacono (2001) found five broad metacategories of how researchers had conceptualised the IT artefact; the tool view (20%), the proxy view (18%), the ensemble view (12%), the computational view (24%) and the nominal view (44%). According to a tool view the IT artefact is represented as a piece of equipment, application or technique over which humans have control. The IT artefact as a tool is stable, definable, and independent of social arrangements that could be passed from hand to hand and used as is by anyone in order to alter some context. With a proxy view the researcher assumes that critical aspects of IT artefacts can be captured by surrogate measures as for example money, diffusion or users perceptions. Researchers with an ensemble view conceive of the IT artefact more as a “web of computing” focusing on the dynamic interactions between people and technology. This web, or package, also includes components required to apply the artefact in socio-economic activity as for example commitments, skills, support services, arrangements and policies. Articles embracing the computational view are interested in the computational power of information technology (representation, manipulation, storing, transmitting) in order to model aspects of the world. In articles taking a nominal view technology is only present by name and the concept of technology is absent.

Orlikowski and Iacono mean that the larger part (88%, i.e. nominal, computational, tool and proxy view) of the investigated articles black-boxes the IT artefact and therefore retain a kind of latent determinism. Neither of the views identified attempts to understand the complex and fragmented emergence of IT artefacts and, as they put, “how their computational capabilities and cultural meanings become woven in dense and fragile ways via a variety of different and dynamic practices, how they are shaped by (and shape) social relations, political interests, and local and global contexts, and how ongoing developments in, uses of, and improvisations with them generate significant material, symbolic, institutional, and
historical consequences” (Orlikowski and Iacono 2001 p. 133.). Only the ensemble view is recognised as having potential to see technologies and organizations as mutually dependent capturing the social, embedded and interactive aspects of development and use.

In order to increase attention to theorising the IT artefact and capture more powerful conceptualisations for the understanding of a world that has become “increasingly interdependent with ubiquitous, emergent, and dynamic technologies”, Orlikowski and Iacono forward a view offering five premises:

- IT artefacts are always implicated in action and effect – not neutral or given
- IT artefacts are always embedded in some time, place, discourse and community, as such their materiality is bound up with the social aspect of their ongoing development and use
- IT artefacts are usually made up of a multiplicity of interacting fragile and fragmentary components
- IT artefacts emerge from ongoing social and economic practices
- IT artefacts are dynamic, stability is conditional, new materials are invented, features are developed, failed functions are corrected, new standards are set, users adapt the artefact for new and different uses

In a later paper Orlikowski and Scott (2008) are taking this view of the IT artefact a step further by advancing the idea that there is an inherent inseparability between the technical and the social suggesting sociomateriality as term for this emerging genre of research. In this view IT artefacts are conceptualised as sociomaterial assemblages rather than discrete entities or mutually dependent ensembles. They mean that a sociomaterial view challenges the deeply taken-for-granted assumption that technology, work and organizations should be conceptualized separately. They suggest a sociomaterial ontology that is relational presuming the social and material as inherently inseparable that moves away from an ontology of human-technology-interaction indicating separation and focus on how technologies are influencing humans.

Orlikowski and Scott draw some important conclusions relevant for thinking about evaluation of information systems. 1) IT artefacts are an integral part how work is made to work 2) Researchers should frame their analysis in terms of practices in order to more effectively examine the specific forms of sociomateriality that are entailed in performing every day work and how artefact and human boundaries and relations are enacted in recurrent activities 3) Visibility of technological entailments of everyday work will increase our capacity to understand, monitor, reflect on and change those 4) IS researchers have the opportunity and responsibility to influence what future is enacted with those IT artefacts.

3 Comparing the sociomaterial view with an empirically based conceptualisation of a social work information system

In this section we present an empirically based conceptualization of a social work information system in a Swedish municipality (figure 1). What is pictured is a social work information system, which had been running in this specific practice for about 10 years. In the end of the section we discuss resemblances between what the conceptualization in the rich picture (figure 1) and the sociomaterial view. The rich picture was developed in an evaluation of a social work system. The evaluation approach used was grounded in pragmatic knowledge theories, the stakeholder model of evaluation and in the school of interpretive IS evaluation.

The rich picture shows the major stakeholders of the system, their actions and relations. The information system support different stakeholder activities, different stakeholders cooperate throughout the system in
order to fulfill agency goals. The taken evaluation perspective give support for developing an overall view of what different actors are doing with the system or by the way of the system. We continue with, in more detail, review what different central stakeholder activities and cooperation’s that was going on in order to get the social work work.

Figure 1. Rich picture of the social work information system from a multi-stakeholder perspective (Lagsten 2007, 2011).

Case handlers
The case handler work with problem-solving together with care takers, this includes personal meetings, counselling, investigations, and dialogue with contractors (i.e. family homes, contact persons, treatment units). The case handlers interact with the system in order to document case information. Documentation consists of, for example, names, dates, activities, decisions, interventions and assessments. In order to make good decisions information from case records or other information on circumstances are retrieved from the system. Case information is saved into the system database. Routines for how to handle cases and how to document cases in the system are used. Case handlers cooperates within the agency in consultation meetings and by adding and using case data in the system, access to case documentation are regulated to assure legal security and privacy for clients.
**Maintenance team**

The maintenance team gives system support to case handlers by guiding system use by telephone if the user is stuck and by making corrections if incorrect data has been entered or detected. They also provide user handbooks and education on system usage. The maintenance team watches over the functionality in the system and performs system care (role administration, run control scripts, logging). Maintenance also works together with the vendor. The vendor delivers a new version of the system yearly and during the year service packs and corrections are delivered based on requirements from the practices using the system. Maintenance personnel perform rigorous tests of those deliverables before implementing them into the production system. There is also a large amount of statistical production done through the system, the maintenance team run different statistical batches (external, internal, routine, pay files).

By the way of the system statistical reports (based on case data in the database) are delivered to national bodies involved in social work (for example Swedish Social Insurance agency and National Statistics Office). The county administration office and the city council are provided with statistical reports in order to follow up on social work results, they form commissions to unit managers. There is also a pay-file delivered daily to the Bank that transacts welfare payments.

**IS-managers**

The IS-managers coordinate and control work and responsibilities in order to maintain the system in the municipality and they assign the commission to the maintenance team. They coordinate development activities and carry out long-term strategic planning. IS-managers handle the contract with the vendor and develop and sustain maintenance models and routines. The IS-managers also coordinate and work together with the maintenance team in different development projects concerning the system.

**Unit managers**

The unit managers perform business planning and manage different units of social work. They use a management information system for analytical purposes that support them with material for business planning. The management information system is built up on statistical extracts from the system.

**IT artefacts are always implicated in action and effect – not neutral or given**

The rich picture shows what different stakeholders are doing with the system and results they produce for other stakeholders that are relying on their actions in order to get the work done. Different stakeholders are acting in parallel in different ways by the way of (code based) predefined actions in order to get their work done and fulfil the goals of the practice.

**IT artefacts are always embedded in some time, place, discourse and community, as such their materiality is bound up with the social aspect of their ongoing development and use**

The rich picture illustrates the “social work community” how work is produced by different actors and the centrality and embeddedness of the system in order to get the work done. Unfolding and contrasting different actions and concerns illustrate how the system is embedded in various subsets in the practice and in processes that span unit borders, group activities and organisational levels.

**IT artefacts are usually made up of a multiplicity of interacting fragile and fragmentary components**

Some of the interacting components of the IS are visible; the database, the GUI, files sent to other systems, new versions, service packages and corrections from the vendor. But much of the uncountable, fragile and fragmentary components (as protocols, servers, operating systems, transactions, code, helper applications, data communication, configurations) are hidden in the picture giving priority to human actions.
IT artefacts emerge from ongoing social and economic practices

Individual users, groups and procedures inside and outside the social work practice are influenced by the actions performed. For example the bank gets a daily pay file generated by the system, managers are using a planning system built on extracts from the system and case handlers make decisions based on what other case handlers has chosen to document in the system. It is clear that the IS is embedded in social actions of ongoing development and use and emerge from the ongoing social and economic practices. These practices make up the IS as well as the IS preserve and structure them. There is no sharp border for what’s in the system or what is outside, the system is unbound.

IT artefacts are dynamic, stability is conditional, new materials are invented, features are developed, failed functions are corrected, new standards are set, users adapt the artefact for new and different uses

The IS is dynamic, new features are developed, failed functions are corrected, new standards are set, users adapt the artefact for new and different uses

What makes up the system, described in figure 1, is a compound mix of human actions, material and instruments artefacted and enacted for the purpose of getting the work done. This picture is, we think, quite uncontroversial and quite obvious in depicting what’s going on in practice.

4 Preliminary problems with the notion of sociomateriality

So far has the sociomaterial view has shown to be in alignment with the empirical conceptualisation providing a theoretical basis. But there are also some problems with the view. Orlikowski and Scott suggest that IT artefacts should be conceptualised as sociomaterial assemblages as opposed to discrete entities or mutually dependent ensembles. This statement is problematic because they do not provide a comprehensive account for what such assemblages consists of. They continue with stating that a sociomaterial view challenges the deeply taken-for-granted assumption that technology, work and organizations should be conceptualized separately. From our perspective we agree to this statement and believe that this is a similar position as taken in the conceptualisation in the rich picture (figure 1). But then Orlikowski and Scott state that sociomaterial ontology “is a relational ontology that presumes the social and the material are inherently inseparable” (p. 456). This is problematic because it, as we see it, Orlikowski and Scott mystifies the unit of analysis; it is difficult for the researcher to imagine what actually is suggested to be studied. Researchers need some unit of analysis (as for example things, constructions, actions) that is comprehensible. IT artefacts conceptualised as sociomaterial assemblages leave the researcher in a void when it comes to what substances to analyse and collect data about (assemblage of what). A further, but preliminary, analysis of Orlikowski and Scott implies that behind the first seemingly similar premises (matching the empirical conceptualisation and sociomateriality) there are some paradigmatic discrepancies. The following list of problems (P) is identified based on exemplifying quotations (Q) from Orlikowski and Scott:

Q1 IT artefacts should be conceptualised as sociomaterial assemblages as opposed to discrete entities or mutually dependent ensembles.

Q2 Sociomaterial ontology is a relational ontology “that presumes the social and the material are inherently inseparable

P1 Sociomaterial assemblages leave the researcher in a void when it comes to what substances to analyse and collect data about - assemblage of what?

Q4 ... frame our analysis in terms of practices instead, we can more effectively examine the specific forms of sociomateriality that are entailed in performing everyday work.

Q5 Work practices are inherently sociomaterial, and so to understand work, we must understand its
sociomaterial (re)configurations

P2 Leave out human action as central for study (individual level), focus is on practices as patterns (organisational level)

P3 Mainly in search for consequences on organisational level of information systems use

Q6 Some salient research questions would include how particular, inherently sociomaterial, organizational forms pattern practice, for example: very-large conversations using Web-based discussion forums; collaborative dynamics within e-Science Grids; habitats of connectivity formed through extensive use of Blackberries and wearable mobile technologies.

P4 The sociomaterial view is not tailored for a design or redesign interest

P5 The researcher role seem to become more of a discoverer of patterns than responsible change agent

Q7 Yet, evidence from contemporary organizations suggests that work practices are constituted by an array of sociomaterial agencies, for example, space, devices, standards, categories, algorithms, expert judgements, physical mechanisms, and so on.

P6 Ambiguous use of central concepts

This preliminary analysis shows that it is not evident that sociomateriality could serve as the theoretical foundation that was sought after. The analysis is only initial and there are probably misunderstandings done. A more thorough analysis and comparison of paradigmatic assumptions needs to be done.

5 Conclusions - alternative ways to proceed

Having elaborated on the view of sociomateriality in order to assess if the sociomaterial view could serve as a theoretical base for the empirical conceptualization presented (of the information system as evaluation object) we suspect that the sociomaterial view not is a suitable foundation. Following alternative ways to proceed are identified.

1. Abandon the idea of using sociomateriality as base for conceptualising the "evaluation object”.
2. Extend sociomateriality with more explicit notions of action and practice (this also includes altering of the ontology).
3. Abandon the idea that the conceptualisation of the SWIS provides an important empirical example that contributes to the discussion on how to conceptualise IT artefacts.
4. Abandon the idea that a schematic conceptualisation of the IS provide comprehensiveness to the evaluation process.
5. Forwarding the idea that a conceptualisation of the information system always is “in the making” and in the “eye of the stakeholder” and therefore must be empirically built, bottom up, as part of the evaluation process.
6. Regard practice theory (combined with stakeholder view) as sufficient as theoretical foundation providing rationality for conceptualising the evaluation object.
7. Consider the SWIS conceptualisation as a conceptualisation of an “IT artefacte practice” instead of an “IT artefact”.
References


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