Making Sense of Electronic Patient Records: How Users' Values Influence Technology Adoption

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Abstract

The purpose of this paper is to explore the relationship between users’ sensemaking and the implementation of Information Systems (IS). Building on a practice-based understanding of IS implementation as a social process unfolding in the interrelationship between IS, users and the organizational context, we report from an empirical study of the implementation of an Electronic Patient Record (EPR) system in two Danish hospital wards. We pursue an interpretive research approach to explore how two groups of health professionals make sense of an EPR implementation process. We identify four sets of values (related to status matters, work practices, the core mission of the clinical work, and personal issues) which influence health professionals’ sensemaking and actions in this implementation process. These values should be considered by management in order to improve IS implementations in organizations.

Keywords: IS implementation, health sector, sensemaking, values.
1 INTRODUCTION

In recent years there has been an increasing demand to exploit the possibilities of information systems (IS) in the Danish health care area in general and in the hospital sector in particular. Hospital managers perceive IS (in this context normally termed health care information systems (HIS)) as the tool for handling the increased need for better health care facilities including coherence and quality of the clinical services provided to the patients. A central technology in the daily processes of the clinical practice is Electronic Patient Record (EPR) systems, which are defined as “clinical information system[s] that directly support a process oriented examination, treatment, and care of the individual patient” (Danish Ministry of the Interior and Health 2000: 15). The EPR system is considered one way to comply with future objectives such as high quality in patient treatment and care.

In 2003 the Danish Ministry of the Interior and Health stated in its national IT strategy that all Danish hospitals must implement EPR systems before 2006 or as soon as possible after this date. As a consequence the implementation of EPRs has been a key challenge for Danish hospitals in recent years. Despite high expectations to EPRs from politicians, these systems have proven more difficult to adopt into the clinical practice than first assumed. Newspaper headlines often report on disappointments involving EPR systems: “Millions of Danish kroner feared wasted. EPR implementation in counties has stopped” (Allingstrup 2006), “Hospital paralyzed because of EPR error” (Madsen 2006), “Electronic records cause problems” (Rasmussen 2005).

When asked about the challenges, health care professionals emphasize that EPR technologies do not meet all their requirements and that they need to create workarounds (Gasser 1986) in order to carry out certain work procedures. They also argue that it is time-consuming to use the EPR system and that it shifts focus from patients to more administrative tasks. In other words, technology fails in some respects to accomplish the requirements of its users, which may be explained by for instance cultural, technical, and organizational aspects (Berg, Plass et al. 1999).

While failure or difficulties in implementing IS is not a phenomenon specifically related to HIS, these systems are characterized by being highly complex and involving radical changes in the everyday lives of health care professionals. Berg (1999) states that various contextual factors such as the patients, the organizational conditions (embracing different professions), and the knowledge base make medical work practices stand out as a complex endeavour. Adding IS to the work practices increases the complexity even further. Implementation and use of HIS are therefore dependent upon how users understand and make sense of information systems. Users are not passive receivers and integrators of IS but are active players in defining and using IS in their complex daily work processes.

The IS implementation literature has dealt with important aspects of the relationship between users and technology, e.g. unexpected changes in work practices emerging when different technologies are introduced (Robey and Boudreau 1999), reproduction of work practices (Schultze and Boland 2000), drastic changes in work practices when technologies are introduced in the organization (Barrett and Walsham 1999), or changes in roles and power relations (Markus and Robey 1988). But only few studies have as yet discussed the relationship between social actions, cognition, and technology (Davidson 2002; Bhattacherjee and Premkumar 2004).

Building on the contention that it is of central importance how individuals and groups make sense of and enact their social environments (Weick 1995), the purpose of our study is to explore how users make sense of IS implementations by focusing on their perceptions of and reactions to the introduction of technology in a local organizational context. We aim to contribute to the growing understanding of how users’ cognition influences and shapes their actions when implementing IS in organizations.

This paper reports our findings from a study of how two groups of health care professionals made sense of an EPR implementation. The study is based on an interpretive case study design where we used cognitive mapping to identify the dominant values among two groups of professionals and how
these values influence their sensemaking of an EPR implementation. Our findings point to four sets of values (related to status matters, work practices, the core mission of the clinical work, and personal issues) which were shared among the professionals, and which influenced how they made sense of and reacted to the EPR system.

The paper is structured as follows. The next section provides an overview of IS implementation in the health sector and how sensemaking can enhance our understanding of this process. We then present the research methodology and the case setting. Following this, the findings are presented and discussed. We finish the paper by concluding on the relevance of the study for research on IS implementation in general and in the health sector specifically and finally suggest some implications for future research. We discuss the importance of focusing on users’ sensemaking processes and the values which influence these processes in IS implementation in order to understand how users react to new technology.

2 SOCIAL ASPECTS OF IS IMPLEMENTATIONS IN HEALTH CARE

We position our study in the IS implementation literature where the implementation of technology is considered as a process unfolding in the interaction between users and technology in a local context. Previous studies in this field of research suggest that higher priority should be given to issues on social aspects of IS implementation and IS use (Barley 1986; Schultze and Boland 2000; Vaast and Walsham 2005). This suggestion is based on the understanding that IS implementations are influenced and created by those people in organizations who are going to use the technology (Barley 1986). Vaast and Walsham (2005) therefore call for studies examining the representations that shape users’ understanding of their work and of the technology. In addition, Boudreau and Robey (2005) argue that we must turn our attention towards human agency and social interpretation in order to explain the various outcomes from the use of technology. They suggest that users are more or less free to enact technologies in different ways and that they adapt the use of technologies in response to local needs. Lamb and Kling (2003) also suggest that by reconceptualising the user as a social actor, we will not only be able to study users’ perceptions and attitudes towards IS, but also take into consideration the organizational context that shapes IS implementation.

Several studies have been conducted that focus on IS implementations in health care from a social and organizational perspective. For instance, Berg (1998; 1999) has carried out a number of studies that highlight the complexity of implementing IS in a health care setting, looking at the way in which patient records and health care workers cooperate and mutually influence each other. Based on these concrete studies, Berg considers the relation between IS and work procedures within the health care sector by discussing not only technological possibilities but also organizational and political consequences of implementing IS.

Another study which focuses on social aspects of IS implementation in health care and users’ perceptions of the use of technology in their work practices is Kohli and Kettinger’s (2004) investigation of the introduction of a profiling system among a group of physicians. The aim of the technology was to reduce the procedural costs of the doctors and to adopt practices that would produce better outcomes. The study emphasizes the importance of the interdependencies between actors, technology, and contextual factors. Similarly, it shows how the professional identity and autonomy of doctors both shape and are shaped by the implementation. It is argued that the technology introduced into a clinical setting needs to meet expectations and values of doctors and that it must be adopted from within the group of doctors in order to gain commitment from and respect among them.

In a similar way, Apker (2004) explores how a group of nurses makes sense of a change towards a managed care system. She draws on sensemaking theory and argues that nurses’ interpretations of managed care are grounded in their care giving role and their identity construction. From a sensemaking perspective, both Henfridsson (1999) and Bansler and Havn (2004) argue that various
user groups strive to achieve their respective goals and fulfill their needs by reflecting upon what is meaningful, i.e. what makes sense to them in respect to their profession and work activities. Henfridsson (1999) uses a sensemaking perspective for understanding IS adaptation in organizations by focusing on the dynamics in the meaning and creation processes among human actors. He asserts that technologies become useful in specific organizational contexts through organizational members’ action and meaning production and shows how they ascribe meaning to IS. Bansler and Havn (2004) study the implementation of groupware technology in an organizational setting from a sensemaking perspective. They encourage researchers to study how sensemaking processes of organizational members influence the implementation and use of technology in organizations and argue that a sensemaking perspective will help managers in clarifying values, needs, and priorities of users when implementing IS.

So far only few attempts have been made to study how users make sense of IS implementation and IS use in a health care context and what values actually guide the users in their sensemaking of the technology. One example is a study by Hedström (2007) which emphasizes the values of developing, implementing, and using IS in elderly care. The values are analyzed and categorized into administration, integration, care, and professional issues. The study highlights the importance of taking into account the various user groups’ interests and values in the design process.

By drawing attention to the users’ values, the study by Hedström represents a starting point for investigating how users make sense of and react to IS implementations in their organizations. However, a more detailed framework for analyzing these values is lacking. This is why this study explores how two groups of health professionals make sense of an EPR implementation process by identifying four sets of values that influence health professionals’ sensemaking and actions in this implementation process.

### 2.1 Sensemaking and the role of values

To understand how users make sense of EPR implementations, we examine how they view or perceive the technology as well as the more context-specific conditions under which their understandings are formed. Sensemaking (Weick 1995) enables us to address cognitive issues and to understand the EPR implementation process as a meaning construction process that is created and sustained in the interplay between cognition and action.

Sensemaking was first introduced into organizational studies by Weick in 1979. Weick characterizes sensemaking as the “making of sense” (Weick 1995: 7) where sense refers to meaning and making refers to the activity of constructing or creating something. Sensemaking is a retrospective development of a plausible story to explain what people have done and the reasons for why they have acted the way they have (Weick 1979). Although sensemaking is an ongoing process, it is intensified in circumstances where people face new or unexpected situations and when there is no predetermination way to act (Weick, Sutcliffe et al. 2005). Relevant for this study, renewed sensemaking processes may occur when new technology that changes present social relations and work practices is implemented in an organization. Weick refers to technologies as equivoces meaning that they imply “[s]everal possible and plausible interpretations” (Weick 1990: 2). This indicates that technologies do not necessarily lend themselves to the same interpretations among different groups of users and require ongoing sensemaking if they are to be contextualized, managed, and adapted to a specific context of use.

The assumption behind sensemaking is that people act on the basis of their interpretations (Orlikowski and Gash 1994; Weick 1995). By acting, people enact social realities and give meaning to them. IS researchers have used sensemaking to examine social aspects of technology. For instance Orlikowski and Gash (1994) suggest that sensemaking theory is a useful lens for this purpose: “To interact with technology, people have to make sense of it; and in this sense-making process, they develop particular assumptions, expectations, and knowledge of the technology, which then serve to shape subsequent actions toward it” (Orlikowski and Gash 1994: 175). They argue that organizational members act on
the basis of frames of references that are implicit guidelines organizing and shaping members’ interpretations of various organizational phenomena. They compare these frames with ideas of shared cognitive structures, interpretive frames, and mental models.

When organization members interact with a technology, they have to figure out what affordances the technology in question offers to them in their specific context of use (Bansler and Havn 2004). This is also known as bracketing, implying that people single out items and/or events in order to connect and make sense of them (Weick 1995). In this bracketing process, the role of values becomes central. According to Rokeach (1973), values represent individual beliefs that form the rationale for action. He defines a value as “… an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable” (Rokeach 1973: 5). Values signify desired preferences and ends. It is through people’s active attribution of meanings to a technology that they can make sense of it and it becomes useful in a specific organizational context. Hedström (2007) defines values as an individual’s opinion on how to act and what to prioritize. The values that people hold will guide their actions and attention in the situations that they face. Individuals will strive to achieve their goals and fulfill their needs by reflecting upon what is meaningful to them, i.e. what makes sense. Bansler and Havn argue that “sensemaking emphasizes that people try to make things rationally accountable to themselves (and others)” (2004: 62).

In this paper, we use sensemaking theory and the role of values to analyze the empirical findings.

3 RESEARCH DESIGN AND PRESENTATION OF CASE STUDY

The study from which we draw in this paper is part of a larger research project (Jensen 2007) and has been conducted on the basis of an interpretive case study design. An interpretive design is appropriate for understanding human action and thinking in an organizational context (Klein and Myers 1999) and for our research purposes, it helps us understand the EPR implementation as a social process unfolding in the interrelationship between technology, users, and the organizational context (Walsham 1993).

3.1 Case setting

The focus of our empirical case study is the implementation and early use of an EPR system in a cardio-thoracic surgery department and an orthopaedic surgery department in two medium-sized Danish hospitals. The cardio-thoracic surgery department takes care of all adult surgical treatment regarding heart, pneumonia, and throat surgery. On a yearly basis 1,320 patients are treated in the department (emergency and planned). The department consists of a standard unit, an outpatient clinic, a perfusion department, and a secretaries’ office. The standard unit which is the empirical focus of this study employs 48 nurses, including a ward nurse, senior nurses, nurses, and students. The orthopaedic surgery department has an average of 3,000 admissions (emergency and planned) per year and consists of a standard ward, an outpatient clinic and a secretaries’ office. Ten consultant surgeons and one managing consultant surgeon are employed. They are specialized in shoulder, knee and hip alloplastics as well as foot surgery.

The EPR systems introduced in the two settings have some common characteristics. They represent a shared and interdisciplinary electronic version of what is known as a patient’s paper record. Contrary to the paper version, the records are stored electronically making it possible for the nurses and doctors to access patient data and enter new data into the system simultaneously from different sites. The EPRs comprise nursing notes, progress notes, physiotherapist notes, diagnoses, medicine schemes, history data, information on temperature and blood pressure, X-rays, and laboratory data. Both systems are off-the-shelf systems meaning that only minor modifications can be made. The health care professionals can define their own terms in the system according to their specialty, but the EPR standards impose some discipline on the users regarding consistency in e.g. data entry and medication procedures.
Implementation of EPRs in the two wards was considered pilot projects for future EPR projects in the hospitals and in other hospitals in the region. The aim of the respective projects was to determine the consequences of introducing EPR systems in relation to work practices, organizing of clinical work in the wards, quality enhancement of patient treatment, and economic effects.

3.2 Data collection and analysis

The first author collected empirical data between August 2004 and December 2005 in immediate continuation of the EPR implementations in the two wards. Cognitive mapping (Eden 1992; Eden and Ackermann 2004) was used to create a visual representation of the values which influenced the professionals' sensemaking of the implementation process. Weick and Bougon (1986) define cognitive maps as representations of the way people in organizations edit their organizational experience into patterns or maps of personal knowledge. Such maps embrace different concepts and relations between concepts that a person uses in order to understand various organizational situations. In our case, the maps were used as a way to explore health care professionals’ sensemaking about EPR implementation and to relate different activities and aspects of the implementation to the values held by the professionals. We report the results of the maps in this paper. Unfortunately due to page limit restriction, there will be no detailed presentation of the maps here and we refer to (Jensen 2007) for a full presentation.

In order to construct the maps, we combined different data techniques including observation studies, interviews, and written materials. We conducted participant observation in the wards where nurses and doctors were observed in their natural settings. This served to improve our understanding of how the professionals interacted with the EPR system during their daily work routines and provided background information in relation to the interview situation. Written material and documentation such as project plans, organization charts, user manuals, newsletters, etc. also served as contextual information. The data used to construct the cognitive maps stems from 24 semi-structured interviews that were held with 10 doctors and 14 nurses. The interviews each lasted between 60-90 minutes. A laddering technique was used in the interviews to help the interviewer elicit higher or lower levels of abstraction of the constructs or concepts presented by the health care professionals in their description of the EPR implementation (Bourne and Jenkins 2005). Finally, as a follow-up activity, a focus group interview was conducted with the group of doctors to get feedback on the initial findings. In the case of the nurses, the findings were reported back in writing for comments and verification. To ensure the consistency of the data, we used a triangulation of different data methods.

The analysis process was inductive, grounded in the empirical findings. We first read carefully through the transcripts of the interviews and the field notes to categorize the different statements and observations into concepts. The first readings were rather structured and close to the empirical data as we used them to draw cognitive maps based on the informants’ own expressions and accounts. The maps are visual representations of the main categories and relations mentioned by the nurses and doctors, and thereby summarize all the interviews for both groups of informants. On the basis of the maps we were able to group the values into four overall categories which relate to a) status matters, b) work practices, c) core mission of the clinical work, and d) personal issues. In the next section, we go into detail with each set of values.

4 FINDINGS

We have identified four sets of values that represent the meanings that the EPR technology has for the health care professionals and that form the basis of how they interact with the system in their everyday practices. These value sets influence their perceptions of and reactions to the new technology and are important in the development of a more detailed understanding of the experienced outcomes of implementing new technology in organizations. The four value sets are presented in table 1 and described in more detail in the following sections.
<table>
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<th>Sets of Values</th>
<th>Definitions</th>
<th>Values mentioned by doctors (D) and nurses (N)</th>
<th>Consequences of implementing EPR as perceived by doctors (D) and nurses (N)</th>
<th>Examples mentioned by doctors (D) and nurses (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Values related to status</strong></td>
<td>Refer to the professionals’ interest in performing within their respective groups of peers and/or vis-à-vis other groups of professionals. This relates to career advancement, status enhancement, and identity preservation or enforcement</td>
<td>Be involved in the decision making in the implementation process (D) Ensure that practice lives up to high quality and security standards (D) Be in control of own profession (N)</td>
<td>Undermining of professional identity (D) Losing authority (D) Losing status by performing secretary work, i.e. typing (D) Spending less time on patients (N) Distancing themselves from their normal procedures (N) Increasing influence (N)</td>
<td>“We are craftsmen. Sitting in front of a computer is not natural” (D) “In the old days, we decided everything. Now we are left out in the cold when it comes to decision making” (D) “As a nurse you need to be able to control things to ensure that nothing goes wrong in relation to the patients” (N)</td>
</tr>
<tr>
<td><strong>Values related to the core mission</strong></td>
<td>Refer to the belief that clinical work practices must serve patients’ best interests. This manifests itself in optimal treatment and care of patients</td>
<td>Obtain optimal patient treatment (D) and care (N) Focus and spend time on patients (D+N) Obtain optimal flow of patients (meet productivity requirements) (D) Ensure secure work procedures and optimal course of hospitalization (N)</td>
<td>Sense that time for patient treatment and care is reduced (D+N) Need to invest a lot of time in the EPR implementation for the sake of the patients (N) Do not invest much time in the implementation, prioritize keeping up with ordinary tasks (D) Difficult to be more productive (D) Lack of security (D+N)</td>
<td>“We are here to take care of the patients” (N) “It is important to give the patients proper treatment” (D) “We do not want to use a lot of our time on administrative tasks. We want to spend time with the patients” (N)</td>
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<tr>
<td><strong>Values related to work practices</strong></td>
<td>Refer to doctors’ and nurses’ interest in facilitating their work practices. This means minimum time spent on administrative tasks and maximum time on the core aspect of their work, namely patient treatment and care</td>
<td>Avoid falling behind schedule (D+N) Facilitate work procedures and not waste time on administrative tasks (D+N) Keep notes up to date and not pass on workload to peers (N+D) Ensure that documentation lives up to requirements (D) Avoid double registration of data (N) Maintain high quality of notes (N)</td>
<td>EPR as a way to facilitate medicine prescription – secure and uniform procedures (D) Time-consuming to use the EPR system (D+N) Have been assigned new work tasks (D) EPR ensures a more thorough and visible documentation (N) Better overview of patients in the system, but the system is still an unfamiliar tool (N) Lack of IT competences (N)</td>
<td>“The EPR system may ease some of the work procedures, for example in relation to the medication procedures” (D) “The doctor now has to refer the patient [for an examination]. Before the secretaries did that” (D) “I feel that I do an insufficient job if the documentation does not meet the standards” (N)</td>
</tr>
<tr>
<td><strong>Values related to personal issues</strong></td>
<td>Refer to issues for motivating and engaging the nurses and doctors. The professionals want to avoid frustration and they want to feel familiar with and confident about using the technology that is introduced into their work practices</td>
<td>Avoid frustration (D+N) Be motivated and engaged (D+N) Obtain ergonomically correct and pleasant work environment (D+N) Feel familiar/confident with EPR system; cannot perform tasks without it (D) Feel familiar/confident with IT and EPR system (N) Feel confident having the superusers/colleagues/EPR manual in the ward (N)</td>
<td>Feeling of confusion – not familiar with and confident in using the EPR system (D+N) Increasing alienation from traditional work tasks (D+N) Seek stability by trying to establish certain patterns of behavior as routines (D+N)</td>
<td>“I still experience problems, but I have become rather confident in using the EPR system” (N) “Frustration includes everything that disturbs, hinders, or delays our work” (D) “I was afraid of doing something that might cause the system to break down. If that happened, I would be in serious trouble” (N)</td>
</tr>
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*Table 1: Overview of values*
4.1 Values related to status

The findings presented in table 1 show nurses and doctors’ conceptions of how the EPR system is to be used in their work practices. This relates to how they consider their role and status in the organization. Values that relate to status matters manifest themselves in the health care professionals’ interests in improving performance within their respective groups of peers and/or vis-à-vis other groups of professionals.

Both doctors and nurses are influenced by motives for career advancement, status enhancement, and identity enforcement. These motives can be fulfilled in different ways and by various means. For instance, the doctors argue that they want to be involved in the decision making process when implementing the EPR system. They perceive themselves as craftsmen and wish to maintain this status and role in the organization by ensuring that their practice lives up to high quality and security standards. However, they experience that the EPR system in some ways undermines their professional identity and that they lose authority and status by e.g. having to perform what they consider as secretary work.

The nurses consider themselves as care providers and they also wish to be in control of their own profession by doing what they are good at, i.e. providing the best possible care to patients. However, they experience that they now spend less time on patients and are distancing themselves from their normal procedures. This is related to the second set of values presented below.

4.2 Values related to core mission

This set of values relates to the notion that changes in the clinical practices caused by the introduction of the EPR system ought to be in the patients’ best interest. The health care professionals strive for a more optimal treatment and care of patients, which is reflected in their expectations of safer procedures for medicine prescriptions, interpretation of various test results, and access to patient data. Both nurses and doctors seem to agree that these issues are extremely important for them in their professional work.

Both groups argue that their core occupational role is to be able to focus and spend time on patients. In addition, the doctors mention aspects related to productivity and efficiency as regards the course of hospitalization of the patients. They want to obtain an optimal flow of patients to meet productivity requirements. Representatives from the nurse group also relate to this type of values. They wish to ensure secure work procedures and an optimal course of hospitalization.

However, both doctors and nurses sense that the time for patient treatment and care is reduced after the introduction of the EPR system. The nurses invest a lot of time in becoming familiar with using the system for the sake of the patients. The doctors prioritize keeping up with their ordinary tasks and do not invest a lot of time in the implementation. They argue that it is difficult to be productive when they have to get used to a new system.

4.3 Values related to work practices

With the introduction of the EPR system, it is important for the doctors and nurses to ensure a facilitation of their work practices and avoid falling behind schedule. This means minimal time spent on administrative tasks and maximum time spent on the core of their work, as discussed above. It is thus important for the health care professionals that the EPR system is stable and that instances where the system might break down are reduced to a minimum. The professionals’ conceptions of their work practices refer to their understandings of how the EPR system will be used in their clinical work and the consequences of its use. They also relate to social issues of technology adoption, e.g. relationships within the two groups of professionals and relationships among different groups of professionals.
Some aspects have been briefly touched upon above e.g. that doctors believe that they have been assigned new work functions that were previously conceived of as the secretaries’ tasks.

Both groups argue for the affordances of using the EPR system in facilitating and improving their work practices. The doctors argue that the EPR system facilitates medicine prescription and may lead to secure and uniform procedures. The nurses consider the EPR system as an important tool in ensuring more systematic and accessible documentation. They believe that the system will eventually give them a better overview of the patients, although some nurses still consider the EPR an unfamiliar tool. They also argue that they lack IT competences.

4.4 Values related to personal issues

The final set of values is manifested by the presence of incentives for motivating and engaging the nurses and doctors. The professionals argue that they want to avoid frustration, and that they wish to feel familiar with and confident in using the EPR technology introduced into their work practices. Another aspect that is related to personal issues is whether the nurses and doctors work in an ergonomically correct environment.

Both groups experience a feeling of confusion and frustration in having to use a new tool to support their daily work activities. They argue that they are not yet familiar with and confident in using the EPR system. This means an increasing alienation from their traditional work tasks. Both groups try to establish certain patterns of behavior as routines in order to accomplish their work but struggle to keep up.

5 DISCUSSION AND IMPLICATIONS

The values identified in this study provide insights into how doctors and nurses make sense of an EPR implementation and react towards it based on their perceptions of the technology. By adopting a social, cognitive perspective on technology implementation, a better understanding can be achieved of what perceptions may possibly influence an implementation. We will point out two important issues in this discussion: a) users must participate actively in IS implementation and b) sensemaking as an analytical tool provides valuable information about users’ reactions to technology.

First, our study supports the findings of earlier research that users need to be active participants in the implementation process. Implementing EPR systems cannot be done without active participation and cooperation of the health care professionals as EPRs influence daily work tasks and routines. For a successful implementation to take place, they have to embrace the technology and make it part of their daily routines, as also pointed out by Berg, Plass et al. (1999) as well as Jensen and Aanestad (2007; 2007). Previous studies have shown that the technology needs to match the work processes of the professionals, which we also acknowledge. However, we contend that more than a match is needed at the level of requirement and functionality – the perceptions of the technology and its use in the daily work processes of the professionals have to cohere. In other words the expectations of how the technology will influence the professionals’ work need to be addressed in order to better understand their reactions to the technology implementation.

Second, our findings support the relatively few implementation studies that adopt a social, cognitive perspective to understand users’ sensemaking. By focusing on the values on which users’ sensemaking is based, a more detailed understanding of how users react to technology is provided. The values guide peoples’ attention and actions, and it is thus by focusing on users’ underlying values that we will be able to understand how they interpret, act, and react to the implementation of technology in their organizational context. In this study for example we see what both nurses and doctors put forward as values when it comes to using the EPR technology and how they actually perceive the current situation.
From a sensemaking perspective, the doctors and nurses continuously construct and try to maintain their identity and role in the organization. These aspects are reproduced in the way they talk about the implementation, how they interact with the EPR system, as well as how many resources they respectively choose to put into the EPR implementation process. According to Weick (1995), establishing and maintaining an identity are core preoccupations of sensemaking. The act of sensemaking is thus reflected in a person’s self-perception and his or her image or identity from other people’s point of view. From a sensemaking perspective, the notions of identity construction, role retention, and status enhancement are relevant aspects when trying to understand the basis on which both the doctors and the nurses perceive the EPR implementation and act in relation to it.

Our study has implications for how an implementation of technology is approached by managers. The findings support researchers who have shown that it is important for management to ensure active user participation. Although some studies (see e.g. Segars and Grover 1993; Hayes and Walsham 2001) focus on how end-users represent IS and how their work environment affects the adoption and use of IS, focus has mainly been on users’ actions and reactions to technology implementation and has not involved social psychological considerations of the dynamics between actions, practices and representations (Vaast and Walsham 2005). Our findings suggest that managers can gain a better understanding of how users will react to technology implementations by examining the values that shape their sensemaking. This knowledge can then be used to address challenges in the implementation process and thereby facilitate a more successful technology implementation process.

Our findings from this study are directly related to a health care context. Although we expect that they are also relevant for other contexts, further research is needed to discuss in more detail how the relationship between users and technology evolves in the everyday work practices in other settings where organizational and professional dynamics are different. Furthermore, future studies should investigate the relation between users’ sensemaking and their actions as a dynamic relationship which continuously changes.

In this paper, we have provided snapshots of specific user groups’ perceptions of IS following an implementation process. One future research challenge is to develop a method for studying how and if users’ sensemaking change over time as the technology becomes integrated into users’ work routines and how this influences their perceptions of and reactions to technology.

6 CONCLUSION

The purpose of this paper has been to focus on the relationship between users’ sensemaking and the implementation of IS. We have pursued an interpretive research approach to explore how two groups of health professionals make sense of an EPR implementation process. Based on empirical findings, we have identified four sets of values which influence health professionals’ meaning constructions and actions in this implementation process. These are: values related to status, values related to core mission, values related to work practices, and values related to personal issues.

In conclusion we suggest that sensemaking as an analytical tool provides valuable information about users’ reactions to technology. By focusing on the values on which users’ sensemaking is based, a more detailed understanding of how users react to technology is provided. Users’ sensemaking and the values from which they draw in the sensemaking process should be considered by management in order to improve IS implementations in organizations.
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