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Assessing the business value of electronic order-to-payment cycle

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ATTITUDES TO INFORMATION TECHNOLOGY
IN HEALTH CARE PROFESSIONS

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Abstract: *The purpose of this paper is to explore attitudes towards IT among various categories of health care staff; health care professions. We will identify problem areas that may be the reasons for why different attitudes among different professions at a healthcare organisation exist, and subsequently we will analyse how this may have impact on how to make sense of IT use. The research question is: What factors may explain differences regarding attitudes to IT among different professions in a health care organisation?* The *paper reports from a particular study of the "NU" healthcare organisation in west Sweden. The results reveal two main problem areas: i) the infrastructural and; ii) the socio-organisational. These are discussed as analytical implications for bridging the gaps between different professions in health care organisations.*

1   INTRODUCTION

As modern information technologies (IT) now offer new possibilities for improving almost every aspect of health care, their implementation is a highly relevant and fast accelerating process. The initiatives themselves vary greatly from scattered single projects of various ICT solutions to large national programmes. The domain has been studied intensively during the last decades. The studies have been conducted in several ways and from different perspectives. Many researchers have used empirical approaches to analyse how IT can support standardisation and flexibility (Hanseth, 1996), work practice and coordination (Lundberg, 2000), IT and gender (Wilson & Howcroft, 2000) and adoption in context (Chiasson & Davidson, 2004; Cho et al, 2008). All these studies address the issue of IT and its design and use in a medical work context. For instance, Heath & Luff (2000) present several examples where seemingly innovative and reliable systems have failed when introduced into specific and critical organisational contexts, such as health care work. In much of these examples the system in question does not necessary cause severe problems, but it is simply "under-used" or rather. They call for further examples that actually take the serious account of detailed user studies attempting to exploit the fundamentals of and attitudes towards new technology, in order to find implications for re-design or adopt them. Wilson & Howcroft (2000) highlights another aspect when they point out that IT use is more or less closely related to socio-cultural perspectives such as gender, roles, and the individual competence level. The results of their studies show that health care workers associate

information systems and information technology to effectiveness and control, which is perceived as being in conflict to the traditional values of healthcare: care and humanity. In Chiasson & Davidson (2004) they discuss the use of IS theory in understanding IT adoption in health care. They call for a deeper consideration of the actual context of health care settings in order to explore new challenges for both the health care industry (practitioners) as well as to develop new IS theories (researchers).

We argue that research aiming to understand people's assumptions, attitudes, and knowledge is of special interest when discussing change in organisations, especially when change is caused by IT. Many varying factors contribute to the understandings of attitudes towards IT in health care. Many of the factors concern the flexibility of the systems and whether they were 'fit for purpose', along with the confidence and experience of the actual IT users. We believe that attitudes of practitioners are a significant factor in the acceptance and efficiency of use of IT in practice. There is a clear correlation between people's mental frames and their technology use. Previous research indicates that during conditions where the technological frames of key persons and divergent stakeholder groups, such as managers, technical experts and users, differ a lot the result can be even more complex and cause problems and conflicts related to IT design and use (Orlikowski & Gash, 1994; Constantinides & Barrett, 2006).

In this paper we take this previous research seriously. Treated as purely technical in nature, IT issues in health care should gravitate towards a more soft and people-oriented approach. Point of care delivery is vital for the success of any application in the clinical healthcare environment. We aim to explore attitudes towards IT among various categories of health care staff; health care professions. We will identify problem areas that may be the reasons for why different attitudes among different professions at a healthcare organisation exist, and subsequently we will analyse how this may have impact on how to understand and use IT. The research questions is: *What factors may explain differences regarding attitudes to IT among different professions in a health care organisation?* The paper reports from a particular study of the "NU" healthcare organisation in west Sweden. By attitudes we mean peoples assumptions and expectations that relate to their understanding and use of IT. We assume that these are tightly related to the knowledge and experiences developed during IT implementation and adaptation processes. This is based on assumptions used for instance in theories developed by Henfridsson (1999). Orlikowski & Gash (1994) use the concept 'technological frames' when they analyse different attitudes towards technology. They say that individuals create mental models and expectations about their future use of IT in work organisations. Here we will identify the gap that may exist in between the different models of the technological aim and how this gap may be bridged.

2 RESEARCH METHOD

We have used ethnographic methods as a means to study contexts where the organisation of human interaction and computer support is apparent. Ethnography is a collection of methods for collecting and analysing data from empirical settings. According to Hammersley & Atkinson (1995) the importance of attitudes is obvious, which means that we try to understand and make sense of actors and activities in the organisation under study.

Our research was conducted as an ethnographic study of a health care organisation in Sweden, the NU Health Care. The NU health care is divided into five hospitals in different cities, two of the hospitals are complete with emergency departments and the other is classified as local area hospitals. The study took place in two of the five sites of the highly distributed organisation. In order to get a

coherent understanding of the work conditions and the people's attitudes to IT we strove for a broad representation from various key professionals from both the emergency department and the IT department. All together we interviewed 20 persons that represented the operational as well as management categories at both departments. Their professions were ranging from doctors, nurses, secretaries, management, IT co-ordinators, supporters to ambulance drivers. As mentioned earlier, the two sites we studied were located in two towns. Here we can suppose that there exist different cultures that have developed over the years. However, this perspective addressing a more geographical and cultural aspect we have not been into so deeply.

We applied semi-structured interviews. Some questions were adjusted in order to capture the specific conditions of the different interviewee categories. The questions were grouped under headings such as *current work activities*, a*ttitudes to IT*, t*he fusion and integration of the organisations into "NU"*. The interviews lasted for 45 to 75 minutes each and were all recorded. Except the interviewer we were at least one more to take notes and comments during the interview session. In our study the informants were interviewed in their real work place and wore their actual working clothes. A consequence of this may be that the attitudes recorded in the interviews are rather expressed in a role-playing game, from a perspective of what they should say rather than what they in fact like to say.

By using qualitative analysis to the empirical data, many researchers see the potential for informing appropriate lessons learned for improving the design and use of IT. (e.g. Hughes, Randall, and Shapiro, 1992). In our analysis we try to be constructive in the situations where we found a "gap" between different technological frames among the different professions. In this analysis we did not necessarily see typical design issues but rather analytical findings that may have impact on the design as well as use and adaptation of IT in the organisation.Before the analysis took place we read the material several times. We interpreted the data through continuous discussions. At the same time it was possible to reflect upon the situation recorded and this is of special importance in long, qualitative interviews, according to Mc Cracken (1988).

3   ATTITUDES TO INFORMATION TECHNOLOGY

There are several perspectives that relate to people's attitudes to technology, on the one hand the perspective that relates to the individual and on the other hand the one that relates to social processes within the organisation. To be able 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 effect their actions toward it. While these interpretations become taken-for-granted and are rarely brought to the surface and reflected on, they nevertheless remain significant in influencing how actors in organisations think about and act toward technology, (Orlikowski & Gash, 1994). Further, Orlikowski & Gash (1994) suggests a conceptual framework when studying people's underlying assumptions, expectations, attitudes, knowledge and experiences of technology. These interpretations of technology, *technological frames*, are central to how people interact with technology. The framework consists of three categories that can be applied on empirical data to characterise the result.

- *Nature of Technology* – refers to people's images of the technology and their understanding of its capabilities and functionality.
- *Technology Strategy* – refers to people's views of why their organization acquired and implemented the technology. It includes their understanding of the motivation or vision behind the adoption decision and its likely value to the organization.

- *Technology in use* – refers to people's understanding of how the technology will be used on a day-to-day basis and the likely or actual conditions and consequences associated with such use.

These conceptual models or technological frames are essential when the individual interpret and understand his and others actions toward information and communication technology. It is however important to emphasise that these interpretations have a distinct social dimension. They appear, develop and change in interaction with the information technology as well as with other people.

A sociologist who has great influence on the understanding of how people relate to information technology is Karl Weick. Weick (1995) consider that sensemaking can start with someone noticing something different in the organisation. There are several barriers to make these assumptions public and accepted, although one ought to consider that the problem is obvious. It may be something very complex and therefor difficult to understand. Orlikowski & Gash (1994) refer to the same phenomenon when they argue that pre-understanding play an important role under these circumstances.

Henfridsson (1999) has been studying sensemaking in organisations related to adaptation of IT. He proposes that Karl Weicks (1995) sensemaking perspective is especially useful in order to understand IT-adaptation in a micro-perspective. Henfridsson has been studying the process, which an organisation transits when IT first is introduced and until the technology is a part of people's taken-for-granted conceptions. He also defines three elements of this transitional process, between the phase associated with ambiguity about an IT-artefact and the following phase of common-sensible use of the same IT-artefact. The elements are referred to as "enactments" and can be described as identity-construction, self-fulfilling prophecies, and organisational defences. In our study Orlikowski and Gash may help us in understanding the different attitudes from the perspective of an individual professional technological frame. The categories that they are suggesting can make it possible to obtain a clear picture of an actual condition in the process of IT-adaptation.

4 RESEARCH SITE: THE "NU" HEALTH CARE ORGANISATION

The study was conducted in the NU health care in Sweden. The NU health care is divided in five hospitals in different cities, two of the hospitals are complete with emergency departments and the other is classified as local area hospitals. In the below sector the organisational structure, that faced the reality when the study was conducted, is described. At this time there was although a very unstable situation characterised by organisational changes. This comes from political turbulence as well as from constant threats about economical reductions for the health care sector in general, but most important was however the discussion that dealt with the question of closing one of the emergency departments in the NU health care.

4.1 The IT-department

There are three people sharing the role of IT-manager, one of those are also responsible for the IT-strategy within the NU healthcare and is also a doctor. As an IT-strategist he also participates in the regional IT-managing group, which are supervising the IT-director and have the primary responsibility for IT in the region. There is also an IT advisory team that function as a link between the health care management and the IT managers, in this team both practitioners and IT-people is taking part.

4.2   The emergency department

The emergency department is divided in two departments; each of them located on different hospitals in different cities. The two departments have one common manager. There are several section managers on each department responsible for scheduling, personnel businesses among other things. The emergency department has a medical department, a surgeon department and an emergency department for children, ears and gynaecology and during the nights and weekends. In the clinic nurses, assistant nurses, doctors and medical secretaries works. Every department has their own IT-co-ordinator that function as the primary support to the personnel.

4.3   The information in the healthcare system

The information flow in the healthcare sector is complex. It can be divided into three categories. There is the information that is protected by the law of secrecy, the so-called medical records where patient information is collected in archives. The information includes individual information, diagnoses and treatments for every contact that the person has had with the department. The information system also includes an administrative information volume, for example messages from the personnel department, protocols, and notes from meetings among other things.

When it comes to information that aim to support medical treatments, documents are created by one individual that has the expert knowledge within the specific area. This information is then used in a variety of different documents and is part of many different document-flows. Either the document is used as it is or it is read and rewritten. This duplicating of information involves many risks. When the document is distributed throughout the organisation, it is difficult to determine what version is the most recent. It is impossible to know how many who has interpreted and rewritten the information, and therefore it is hard to know if the original message is changed. As expressed by one of the IT-coordinators:

> "The information handling in the healthcare is extremely complex. There is a need of one solid group of people who really understand how systems is constructed in order to describe the handling of information in the health care properly and to deliver the specification to the people who are going to develop this. I do not think we have ever succeeded with it...we must develop solutions that generates something useful for the people that are making the beds and are helping the patients on the health department. If we cannot do this soon, then they won't understand why we buy a computer and put it in the expedition. ...We have a long way to go, the health care need to mobilize a huge knowledge to be able to do the descriptions that is needed.

5   SENSE-MAKING OF IT IN THE "NU" HEALTHCARE

The ethnographic study has provided an understanding of the sensemaking of IT in the organisation. There are large differences between different groups of professions, though within one profession the sense making has shown to be relatively homogeneous. From our empirical material we have tried to crystallise the different approaches to IT, put them together in groups and identify the contrasts between them. To explain the different approaches to IT we have derived two comprehensive categories that are argued to constitute the essential problem areas: infrastructure and socio-organisational problems.

5.1 Infrastructural problem areas

In the infrastructural processes the present systemic conditions can be seen as a main problem. We found three subcategories, which we decided to name activity-adapted functionality, communication and integration between systems together with co-ordination of initiatives.

5.1.1 Activity adapted functionality

In the NU health care they have only started the work with descriptions of work processes and routines. This work has been started to avoid creating IT solutions with weak coupling to the organisational activities.

The reason is that some people in the organisation have realised the importance of considering the IT infrastructure to support organisational activities. The IT technicians often see as their speciality to secure the technical specifications and other requirements on the IT equipment. People in the NU-organisation are concerned with that IT have proper functions to help them in their daily work. But they are not always aware of the need for functions to cooperate. Different professions here think in different ways. The knowledge about the activities within different areas in the organisation, co-ordination between departments and the technical knowledge do not always walk hand in hand.

People who order new systems need knowledge about organisational needs. When ordering new systems the discussion easily drifts to first of all specify the equipment and its details. The staff in the healthcare is enthusiastic, but at the same time disappointed or dissatisfied. The management often is perceived as alienated from the need of IT support in different areas in the organisation. For example when an Intranet is created there is a risk that management sees and compare this to an information site on the Internet and the references become incorrect.

There is also a problem consisting of communication, where management is not aware of the complexity of managing information. If IT should satisfy the requirements of different work activities in the organisation, a different approach to is needed. The ambition could be to go from standardisation to methods which are characterised by de-central requirements and co-ordination.

5.1.2 Communication and integration between user levels and system levels

The vision is to have access to the patient's records wherever the patient is located. The vision is also that the systems are open and able to communicate with each other. From a user level perspective the routines are almost the opposite today:

> "We are too bad in describing our requirements in the NU health care. Often it is too urgent, the clinics miss the long term thinking about IT support. We are often too late..."

People within the IT profession at "NU" needs to participate in an earlier phase in the requirement process. Both the IT department and the clinical departments need to get together and come to an understanding about functions in a desired system. It could then be easier to formulate the requirements before looking for suitable systems. There is a great amount of work going on at the IT department on standardisation of the technical platform and the products in use. They also try to standardise the user interfaces on the screens.

But from a system level perspective, there is another gap as well. How should the systems exchange information? Today there is a lack of knowledge about principles of standardisation. They are quite unaware of that the standardisation often has an impact on making a choice of a system and that it could be crucial in creating suitable systems- and communication solutions. The integration

between systems is almost non-existent. For example the system for patient case books is completely separated from the system for patient administration, which handles notices to appointments, next visits, diagnoses, registrations and so on. At one clinic they use three different systems to complete the patient care documentation. The systems have to be activated at the same time because some of the information in one of the systems must be manually registered in another system. The work of harmonisation of systems in t he NU health are is going on, but is often met with suspicion.

> "The Västra Götaland region wanted that system [Melior], we, used to work with the old system was not asked, as usual."

When choosing a system it is important to analyse what the system should support and if there is need of a system which allow integration between systems in a smart way.

Most of the patient's records are paper-based today. Though there is an objective that all records should be computer-based in 2002. Medical records are handled separately by each clinic, and each clinics have separate records for each patient they have treated. If the patient is coming to a new clinic it is impossible for them to see if and what medicine is previously prescribed. The consequence is that much time in spent looking for old records in archives at the different clinics or records are freighted by taxi between different hospitals..

> "It should be possible to fill in the forms of X-ray referrals, laboratories referrals etc at the computer. It is bad that it is not possible today. At Huddinge, where I have worked before, the possibility existed already in 1979. It is badly managed by the management. Therefore there are no uniformed systems. It will be difficult for us because we need all three systems. It will probably change very much."

5.1.3   Co-ordination of ideas, initiatives and projects

The results show that there is an optimistic attitude to the future possibilities with IT, both at the operative and the management level. Some different initiatives have already begun, which could be seen as embryos to a positive work towards changes. There is a tendency to invest money and resources on many different small IT-related projects.

In the organisation there are many fruitful ideas about systems for more efficient administration. Workings groups exist within clinics at both NÄL and Uddevalla to co-ordinate the work when new jointly systems are introduced. As an example a project with development of an Intranet could be mentioned. The Intranet should be created and implemented to give the users access to information in an easy and efficient way. The ambition is also to emanate from an original document, and use this original document in different document flows. The aim of the Intranet project is furthermore to develop the infrastructure of the information processing. It is clearly expressed that the Intranet project should not affect and changes local work practice. When each small project is carried out with its own budget the effect is that the advantages of co-ordination is missed. The way that the systems will communicate is also missed when small projects are carried out without co-ordination with each other. Often a more overall project is missed. It is the integration and communication between systems, which are very important when the systems should be used in an efficient way. Other consequences of small projects can also be that small information islands are created, from which information is distributed. The very same information can be created in different places and the risk for an uncontrolled information overload without co-ordination is obvious. No common information sources are created.

5.2   Socio-organisational problem areas

Problems due to the practical use of IT appear continually. We refer to these problems as a socio-organisational problem area. These are extremely intertwined with and in a sense derived from the infrastructural ones, but here we ouline particular categories such as lack of communication, the dialogue about IT, attitudes to their daily IT use, about uncertainty and differences.

5.2.1   Lack in communication – the dialogue about IT

The results show an obvious lack in the communication between different groups and professions within the organisation. In the empirical study there are many examples on this phenomenon. Regarding the NU health care IT vision the personnel has lack of knowledge. All of the personnel told that they did not know anything about the IT vision. The conclusion is that the IT vision is not anchored in the organisation and that there is an obvious lack in communication between the different groups.

   The dialogue concerning user and systems requirements has shown to be problematic. The health care personnel consider themselves as bad in describing their requirements. The reason is not fully clear. But the mental pictures of what to focus in the choice of system are different in different groups. For example has the health care personnel more knowledge about which functions the system has to have. The IT personnel are instead focussed on which communication standard is required. Today the health care personnel come up with ideas. These ideas are also rather incomplete due to the technical requirements. One reason to the problematic situation is that the technical competence is coming in too late in the process of describing the requirements. The following example also shows the difficulties in communication between the IT personnel and the health care personnel. The language used within the IT community is rather technical and that will cause problems.

> "It is very difficult for me to really explain in the project administration group, what we are able to create in this project, and to have them to understand this theoretical discussion and give them a chance to really say yes or no. They really understand the activities in the health care, but… the project has interpreted the clinic requirements to a computerised solution and the project administration group is going to take a decision to the amount of resources to create this solution. This implies a lot of things; there are always risks with development projects. It is heavy principles they have to decide on, because it is there principles we have to build upon later on in different IT systems. But when the project administration group says yes, I cannot clearly feel that they have understood what I have told them.

There is a prevalent uncertainty among the IT personnel and the management level at the clinics in decision processes, where IT personnel have knowledge which is hard to communicate to them who are going to make the final decisions.

> "Unfortunately we don't have this, we should need this, we not always agree with the catwalk… so we have talked loosely about this. But it is still so new…"

> "[It is] much dependent on whom you are talking with up there [at the IT department]. If I talk to someone it is away with the fingers, do anything at all. If I talk to someone else it is yes, you can do this… I don't really know which leg to stand on."

5.2.2   Attitudes in the daily IT use

The functionality in the systems is not always adapted to the clinic's routines, which influence the attitudes to IT in a negative way. The knowledge about the systems functionality is therefore important. Regarding signing documentation in the patient's electronic case books the consequence sometimes could be that one have to sign what others have documented. It is perceived as risky because it is possible to have the responsibility for something one has not being involved in. The consequence will be that they not document as much as before.

An essential problem in the daily use of the system is the lack of education in using the documentation system. For example at a clinic in Gothenburg were some of the personnel dedicated for some weeks only to support the use of the system, which was seen as a prerequisite to handle the documentation in a satisfying way.

In spite of theses problems with the system the personnel is very positive to the system. In a few years they think it will work very well. The system only has to be more adapted to the clinics' routines and the personnel need education in using the system.

"If we had good systems and if they worked we could dedicate more time to the nursing work."

"I see very good possibilities with IT but nothing is happen or it goes to slowly and there are many problems…"

The clinics' personnel want a better co-operation, and they wish that they could call the IT department and have support instead of having a service order number.

"I stumble against many problems every day, which is due to the users lack of knowledge."

Amongst the health care personnel there is a negative attitude towards IT, which tends to be caused of fear to changes and to the overall technology. The IT personnel are also aware of this, which the following citation shows:

"… I have also encouraged everyone to use the computers and the Internet to learn and exercise. So the use of hotmail is absolutely OK. Otherwise they will be kept away from the computer if the only are allowed to do certain things. Then they get more exercise to use the keyboard an so on."

The health care personnel see the functions closed to the work activities, which could be computerised. The attitude to IT is much troubling and there are many problems with IT, but if it works it will possibly be good.

"I think we can use this much more than we are doing today. But we need education and information about this. I feel that if one is not trained or interested from the very beginning it is difficult to dare. One does not go into the system then."

The prevailing situation is that there is a kind of negative resignation towards IT. The development is too slowly as it takes too much time etc. The health care personnel also feel that they are bad in handling computers:

"The majority of us are women and have low interest of computers. We see them mostly as type writers. Our computer technicians have not come to their advantage. Probably we could solve many of the problems but we have no time to learn. I see good possibilities with IT but nothing is happened or the process is going too slowly and there are much problems…"

"As a section leader I see the computerised system as a huge problem. We are going to have a

new salary system at the new year, Palett, so we hope it could be better. The old system was miserable, what should take one hour takes a whole day. Now we are doing the salary reports manually so that the salaries will be paid in time before Christmas. It has been hard to log in to the systems."

5.2.3   Uncertainty and differences

Individuals could perceive differences between events going on and events which told to happen (Weick, 1995). It can be exemplified of when a clinic should choose a system. A clinic had a wish of a specific system adapted t o their activities. The IT co-ordinator perceived that the choice of system been something else and not the system they wish to have. Even if the IT co-ordinator in this situation tried to convince himself that it really was the original wish of system they still were searching for, the result was not what was thought. He interpreted the situation as a gap between how it was and how it should be. He tried to make sense of IT based on the intentions of the system, his knowledge and experience about the health care activities and the presumption he had.

The personnel then discovered that the system was not that integrated as expected and they experienced interruptions in their routines. It can arise situations hard to interpret which comprehend unstructured problems, there both the goals and the means are problematic and unclear (Henfridsson, 1999). Weick (1995) means that there is no need for more information when overwhelmed of ambiguity. Instead there is need for appraisals, priorities and clarity of preferences.

One more expressive example relates to the development of an Intranet, which was conducted as a project with a reference group. The reference group is composed of user representatives from five different clinics. Though it is a relatively small group of users. The situation is risky in that it can be more confused and that more interpretations can be added if more information is spread to the individuals in an organisation (Henfridsson, 1999). An IT co-ordinator expressed it as:

"It is tremendously hard for the average user to understand a theoretical discussion of how an Intranet will work and how we had planned the information handling, when the user cannot see the practical solution in front of him/her. And I would say that it gives no more than creating more question marks, therefore we have chosen to work with a reference group of users instead."

It is problematic if the IT co-ordinators would like to change the configuration of the computers at the clinics. Even if they have the education to do this, and if they have a storage from old computers, they are not allowed to mount the storage without the approvement from the IT department. At the same time is the IT department only responsible for the equipment until the wall socket at the clinic. The consequence will be that the personnel feel watched over. There is also a scanning program at each computer, which every time when the computer is stated, reads the configuration of the computer and detect if any new programs have been installed. The personnel is also monitored in their use the Internet. The IT department have the possibility to see which pages the personnel are looking at and for how long time they are connected to the Internet.

6   DISCUSSION

An analysis of the attitudes towards IT with respect to the three dimensions of technological frames (Orlikowski & Gash, 1994) starts with the fairly obvious reflection that the meaning of technology is perceived differently by the two professions: IT- and health care personnel. The technical education and competence of the IT-personnel results in a more imaginative and change oriented attitude. At the

same time, this profession shows a tendency to underestimate the potential problems related to changes in work practice brought on by the use of new systems. In that sense, IT staff can be argued to have primitive view of what Orlikowski and Gash refers to as technology use.

Work at the emergency health care unit is highly complex and involves processes where a large number of people, often under great stress and time pressure, shall co-ordinate their respective tasks into a well-oiled machinery. Even the smallest disturbance or flaw might result in serious consequences for the patients. In light of this, it is perhaps not surprising that the staff mobilizes an organizational defence (Henfridsson, 1999) as a reaction to plans of new systems and applications in the clinic.

The strategy of technology refers to the way an individual or a group of people understands the purpose or the agenda behind the implementation and use of information technology. Wilson and Howcroft (2000) argues that healthcare operatives tends to perceive IT in general as having the primary purpose of monitoring, controlling and rationalizing work. This is in clear conflict with the traditional ideals of nursing, caring and healing, and can consequently result in a rejection of new technology. Subsequently they explain this conflict between technological and professional ideal as being rooted in traditional gender-roles, with nursing and caring as female attributes whereas control and rationality are traditionally male. This gender aspect probably gives an important contribution to the analysis of the case study, but other aspects can offer equally powerful contributions.

As pointed out by Goffman (1969) people tend to adopt different roles when presenting themselves in public life. It cannot be ruled out that the critical attitudes towards new IT systems found in this study has other origins but the ones conveniently afforded by the professional role of a stereotypical nurse or doctor. Perhaps it is easier and more socially accepted to use such a line of argumentation instead of expressing for instance a fear of change and a reluctance to abandon familiar work practices. Furthermore it is worth noticing that this technological strategy ("the vision") is not expressed among IT-personnel. Instead they tend to emphasize efficiency, professionalism and "keeping up with scientific progress". Technology is viewed as having a large potential with respect to increasing the quality of healthcare professionalism. The fact that healthcare operatives still view IT as primarily an instrument of control can be interpreted as a lack of confidence in IT staff as legitimate authorities in the area of healthcare.

Dissonance with respect to how the work practice is perceived and understood could have a negative impact on performance. This study shows that health care operatives are a fairly homogeneous community engaged in a process of common sensemaking with respect to their technological frames. This is so, inspite the fact that the community contains a number of different professions and specialities that needs to communicate and co-ordinate their activities. The study also shows how the IT-staff has arrived at different, yet shared, understanding of technology. This group expresses a somewhat uncritical and unproblematic attitude towards IT, which does not make sense for the end-users in operative healthcare.

The operatives report problems and calls for action regarding the complex processes of information management. IT professionals design 'solutions' aiming at addressing these issues, that in turn is perceived as not appreciating the nature of existing work practices, and consequently run a high risk of being rejected. This fundamental conflict creates a gap that calls for organisational changes in order to be bridged.

In this context it is important to point out that healthcare operatives should not be perceived as being totally hostile towards all technological change. Healthcare in general and emergency healthcare

in particular is constantly invoked in adaptation of new technology. New machines, instrument, and methods of treatment is reforming and revolutionizing work practices all the time. These innovations are however originating from sources that healthcare operative perceives as legitimate professional authorities, hence national or international medical specialists and or new government legislation.

This could contribute to that some of the suspiciousness connected to implementation of new IT systems is replaced with positive expectations and faith, something that dramatically would open for individual and collective sensemaking. In this sense, it is all about giving the IT systems "a fair chance" and consequently end up with faster adaptation, where members of the organization are tolerant and hospitable (Ciborra, 1999), overseeing initial problems related to IT. Such processes should be seen as benign, when they result in improvements with regard to the quality of healthcare, but there is also an evident risk of prolonging the lifetime of less successful ventures. Both scepticism towards IT and positive expectations regarding other care-technologies run the risk of becoming self fulfilling prophecies (Henfridsson, 1999).

What makes the situation somewhat hopeful for the future is the fact that healthcare sector have long traditions of coping with situations where people of different professions (assistants, nurses and doctors) and different area of expertise (medicine, surgery, pathology etc.) manages to integrate their efforts into an efficient operation. The challenge at hand is consequently to involve also IT-specialists and administrators.

Addressing the socio-organisational aspects we believe that a strong candidate as a possible future link between health care professions and IT profession is the IT-co-ordinators. At present their situation is problematic, especially since their profession is fairly new to the organisation, and has not yet positioned itself in relation to other professional groups. The sensemaking of their environment and themselves has not converged to a situation where all stakeholders agree on what part they will be playing. Apart from IT-co-ordinators, also the operative managers might play an important role. Having the benefit of being legitimate authorities in both camps, this category of people could hopefully catalyze a fruitful dialogue that will result in a shared culture with positive attitudes towards sound IT interventions.

The analysis highlights the infrastructural aspects as important aspects of understanding the way people in NU-healthcare relate to IT. The results can be understood as contradicting paradox, where calls for flexible systems that are well rooted in work practice is in conflict with the demands for co-ordination, efficiency and standardisation. It is highly problematic to run large-scale bottom up projects, and at the same time impossible for top down initiatives to gain sufficient momentum, because of organisational defence mechanism (Henfridsson, 1999).

Some changes in the healthcare sector, such as implementation of new apparatus or methods of treatment, are local and situated to one or a few specialist clinics. Other systems (Melior, Adapt etc.) relate to information management (patient records, process reports etc.) and concern the entire organisation. This type of exhaustive systems are difficult to adapt to micro-level requirements, and are to a large extent designed in a way that makes integration with other systems very difficult, (Lundberg, 2000; Hanseth, 1996). Also Lundberg (2000) passes the ball back to designers and system-vendors for the healthcare sector, when arguing that the paradigm of designing generic systems must be replaced a paradigm of designing work oriented infrastructures. Existing systems should be cultivated into supporting a given work practice. This does not imply a conservation of existing routines, but rather that innovation and change should evolve from a close co-operation between designers, IT-professionals and healthcare operatives, making sure that common sensemaking is

aligned with an optimal use, meaning and strategy for information technology. This may call for a profession-oriented infrastructure rather?

7 CONCLUSION

The aim of this study was to explore problem areas concerning different attitudes to IT in health care. The conclusions are derived mainly from the ethnographic study but some theoretical discussions have also been developed. Two main problem areas were found: the infrastructural and the socio-organisational. We have argued for a dialectic approach, which means that we consider both the individual as well as the social processes that build up the attitudes to IT. We found reasons for the differences that include lack of co-ordination between professional groups, human communication problems, and hindrances in systems integration and low level of knowledge and understanding in the daily IT aim and use. Here we have tried to be constructive and find mechanisms that may trigger the social processes between people with different attitudes. The adaptation process will be extremely important as a stage for these processes to take place. We believe that open up the dialogue and reason about the technological aim may foster attitudes that make a better understanding and use of IT in the "NU" health care organisation as well as in similar organisations.

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