Where Superman Is Not On Staff
– on implementation and lacking feedback

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Abstract. Computer systems tend to deliver less than promised. In this article we investigate mechanisms that contribute to this gap through a computer system supposed to facilitate discharge planning. The aim of this system is to increase efficiency and quality, and make information exchange safer. We do the investigation from the perspective of Science and Technology Studies (STS) and skill acquisition. We find that information tends to be hindered from entering the system, rather than ending up in the wrong places as the case was before. Further knowledge that earlier was gleaned from person to person interaction is missing out. Despite being sparse and limited, the information stored in the system is sufficient to enable action. We therefore see that one risk is exchanged for another. In total, patient safety might suffer, and hence staff ought to compensate for this. This in turn reduces efficiency and hence also the promised gain from the system.

Keywords. Computer system, Information system, Meddix, Discharge planning, Records as Topic, Case management, Patient safety

Introduction

There is a rising awareness and concern that computer systems within health care tend to deliver less than promised. In this article we explore mechanisms that contribute to this gap between what was promised and what was delivered. Our case concerns Meddix, a computer system designed to facilitate discharge planning. The system is an Internet-based planning system, introduced throughout Sweden in 2005. We explored the consequences of Meddix in a social constructive perspective [1]. Material is acquired at three hospitals and their surrounding municipalities in Southern Sweden.

Discharge planning is a complicated process aimed at aligning several organizations. The process starts when a doctor considers a patient ready to leave although she is in need of further rehabilitation and/or care. This leads to an assessment of the patient’s requirements of help, which is to be provided by home nursing care, home care services, nursing homes and/or rehabilitation facilities. Meddix should increase efficiency and quality of the process, and make information exchange safer. The computer system is supposed to do this by providing information to involved actors and by consolidating information for administrative purposes.

Systems like Meddix, storing information about patients in terms of patient records, have been introduced in various settings and formats during recent decades. While

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introduction among general practitioners tends to be rather smooth and promising, introduction at the hospital level tends to be more complicated, due to hospitals being more complicated organizations than those within general practice. This makes both the coordination of use and the implementation harder [2-4]. Because of this, there is reason to believe that introduction and use of Meddix is even more demanding, since the system takes on an even more complex task. The system stores medical information, nursing instructions, rehabilitation and care plans, etc. This is submitted pre and post discharge planning meetings in main by nurses, need assessors, and occupational therapists.

We explore how Meddix influences the quality and coherence of care when responsibility for patients is transferred from hospital to their municipality. Through this we gain knowledge about why computer systems tend to deliver less than promised.

### Storing Patient Information

Computer systems like Meddix are more than archiving devices. By providing the opportunity to act towards the patient even though the patient herself might be absent, these systems contain digital representations of the patients [5, 6]. This provides health professionals with the opportunity to act independently of the patient, by acting towards the information that represents the patient within the system.

In the forthcoming text, we distinguish between Meddix as a tool and Meddix as a storage facility for representations of patients. When we investigate Meddix as a tool, we attune ourselves to how the system shapes practice by being an infrastructure diverse from those it replaced - archives, faxes, phone calls and postal mail.

When we investigate Meddix as a storage facility, we look at the information shared via the infrastructure. We understand this shared information in terms of Immutable mobiles[7]. These manifest relations between actors, can be moved around, and are produced by inscription in one way or another. A map is a perfect example. It is mobile while the actual land is not. The same goes for patient records. The record is mobile independent of the patient.

In our exploration, the terms delegation, programme and anti-programme are important. Delegation involves leaving control of action to others, programme is what one is steering towards, and anti-programme refers to actions with the aim of neutralising the attempts of others to gain control. In accordance with Science and Technology Studies (STS), these ‘others’ may be both human and non-human actors.

Latour [8] discusses strategies used by hotels in order to keep possession of their keys. Three of these are: 1) the staff remind the guests to hand in their keys before they leave the building, 2) display notices that politely request the guests to hand over their keys, and 3) attach heavy key-rings to the keys. All of these are delegation, but whereas the first two involve describing a desired action, the third action is inscribed in the key.

Reminding the guests to hand in their keys convinces one group of guests, putting up a sign a larger group, and attaching heavy weights to the keys an even larger group. Those hotel guests very keen on taking their keys with them might remove the key from the key-ring. That would be an anti-programme to the hotel’s programme.
In what follows, we discuss how the delegation of information-exchange influences the discharge planning process and might pose challenges. We pay special attention to how what is inscribed in Meddix relates to practices.

As a system for the facilitation of discharge planning, Meddix is dependent both on the information stored in the system being accurate, and on users learning to interpret the information in a correct and efficient manner. To analyze the conditions for learning, we turn to one of the most popular models concerning skill acquisition: The so-called Dreyfus-model [9-11]. This suggests a five-step ladder from novice to expert.

**Novices** at the lowest level have no experience of the situation in which they are expected to perform. At the next level, the **advanced beginner** has coped with enough situations to note recurrent components. The **competent** stage is characterized by a feeling of mastery and the ability to cope with challenging situations. Next to the top, the **proficient** perceives situations as wholes, while the **expert** at the top no longer relies on analysis. Instead, an intuitive grasp of the situation makes it possible to zero in on the accurate region of the problem without wasteful consideration.

The difference between the first two stages and the remaining mainly concerns handling of rules. Novices’ and advanced beginners’ lacking experience makes it hard for them to discriminate between normality and what it is worth paying attention to. Besides this, they have to concentrate on the rules they have been taught. While rules are actively used in the first two stages as a basis, they receive less attention later.

From this, it becomes evident that rich feedback is important in developing skills. As partakers in the planning process, discharge planners can easily develop the skills involved in making care-plans, while the skills required in the facilitation of good care are harder to obtain due to the fact that they do not partake in the provision of care. Hence feedback from care as practiced is of great import when the quality of the care provided as a result of the discharge planning process is to be raised.

**Design**

This study is part of a research project conducted at three hospitals in Southern Sweden and their surrounding municipalities. Based upon qualitative interviews, this article investigates how professionals perceive their work practice with and without Meddix. The main material is multi-disciplinary and cross-organizational focus group interviews (n=6) carried out in 2005-06, making up a total of 9 hours. Interviews were conducted prior to and approximately 6 months after Meddix was introduced. Participants were recruited as a convenient sample from all involved positions within primary, secondary and tertiary care. Approximately 50% of participants (total n=46) took part in both pre- and post-implementation interviews. Focus group interviews were taped and transcribed. At one hospital, focus group interviews were extended with eight individual interviews making up a total of 5 hours, due to the lacking participation from district nurses in the group interviewed.

Data was analyzed in partnership between authors in an inductive approach inspired by grounded theory [12]. Coding was constant comparative, and theoretically informed by the theoretical framework laid out earlier, moving focus away from care processes and onto the computer system and the information stored. To increase reliability and assure validity, findings were related to and adjusted by a body of individual discharge planning investigations collected by strategic sampling at one of
the hospitals (N=27). This body is made up of video- or tape-recorded discharge meetings, individual interviews (27 older patients, 25 family members and 19 professionals), medical and social records and other documents related to the cases, as well as national regulations describing discharge planning, local routines etc. 23 cases were conducted prior to and 4 cases after the introduction of Meddix. The second author collected all the data.

The study was approved by the Ethics Committee at the Faculty of Health Sciences, Linköping University, Sweden (Dnr M87-05).

Results

When we look at Meddix as a tool, usability is in general considered to be good by users, and information safety is also judged to be adequate. Users further expressed satisfaction that Meddix provides access to information. One informant put it like this:

Information is at hand. We never had access to see and read like this before.

[...] So far, I think it is better for us.

However, some challenges still remain. One example is that users argue that Meddix is more time-consuming and less effective than expected. When we look behind these quite overt and mundane features, we find a more complex picture.

As with all systems, knowledge among users is a limiting factor. With regard to Meddix, this is a particular challenge due to the relatively high turnover among staff. This, combined with Meddix being designed for competent users and thus having no built-in user guidance or security check, makes knowledge of the system an especially vulnerable area. One user puts it as follows:

Actually, I believe that the computer should ask questions like ‘are you sure?’

[...] after all we are only human and not Superman, you know.

At care facilities where Superman is not on staff, users can therefore create problems in the system that lead to difficulties of many kinds when action is taken on the basis of information in Meddix. Furthermore, processes also take place in parallel-systems, for example by phone. This creates extra work for discharge planners, since they ought to act as quality assurance personnel to neutralize the chance of Meddix acting as an anti-program to its own program:

One must have eagle eyes and ensure that a discharge document really has been written. If this hasn’t been done, the patient is still technically admitted.

And if he is in another department, the system locks up.

When we explore Meddix as a storage facility, we observe that practice contrasts with the ideal of discharge planning as a rather complicated, dynamic and iterative process that normally should involve many and diverse actors at various stages. This influences information stored in the system.

Lack of participation from staff in wards is common, and even district nurses tend to be ‘more absent than appreciated’ in the process. Also, participation from physicians initiating the discharge planning process is said to be very limited. This was also the case prior to the introduction of Meddix, but the system has put information on hand, and thus made it easier to act on limited, sparse and/or meager information. This might pose challenges to patient safety.
Prior to the implementation of Meddix, obtaining information was time-consuming since contact between personnel working in clinical practice had to be established. On the other hand, when contact had been established, rich information was exchanged since ‘off the record-information’ tended to accompany the written information. Hence prior to the introduction of Meddix, only parts of the information exchange had been taken care of by the system.

When asked about feedback practices, the discharge planners are convinced that knowledge of unsuccessful events would be provided through existing meeting places. From our knowledge of organizational structure and practices, we doubt that knowledge of mishaps in general is conveyed to the patient care coordinators responsible. Another problem arising from relying upon negative feedback is that discharge planners do not get any feedback when things go well.

An important obstacle to getting feedback is that personnel are only allowed to access the records of patients they are currently in charge of. Thus checking how something went becomes a violation of rules and not a practice the organization can endorse. Until the implementation of Meddix, this has worked fine due to small talk taking place when information was handed over in persona. Now when Meddix is responsible for the process, such knowledge exchange is missing. Also here, the delegation of information exchange to Meddix has resulted in more limited, sparse and/or meager information.

The lack of feedback processes is compounded by the aim of discharge planning, which is to provide care that is ‘good enough’. This is further aggregated by job segmentation in combination with the limited time available and a narrow time horizon. One informant puts it:

*In principle, I forget Greta when I leave the gates; she is forgotten. Because when I come back, there are five new ones waiting for me.*

An informant states that due to this, she does not feel that she needs to know how the planning turned out in practice:

*I make judgments based upon what I know now. And these decisions are good for 14 days. One must simply believe that one makes the best plans for the patient.*

**Discussion**

The aim of Meddix is to increase efficiency and quality, and make information exchange safer. Furthermore, the system should facilitate cooperation and communication between actors scattered across diverse organizations. Of great import to these are digital representations of patients that can be acted towards independently of the ‘real’ patient.

Delegating information exchange to Meddix has created better access to information, but the information tends to be more limited, sparse and/or meager. This render a digital patient that is a scarce and synthetic imitation of the ‘real’ patient. An important reason is Meddix only taking care of information exchanges that earlier took place in terms of written information. Thus feedback processes that earlier took place in the form of small talk are not taken care of by the system. Furthermore, professionals are hindered from contributing information due, for instance, to their lacking
knowledge, awareness and access. One factor is the demand for confidentiality that acts as an anti-program to the program of quality. Even though information is limited, sparse and/or meager, there is enough to undertake discharge planning.

Due to both the replacement of talk with text and to rules, such as that of confidentiality, information now tends to be hindered from entering and leaving the system, rather than ending up in the wrong places. This reduces feedback and means the discharge planning team remain as novices or advanced beginners in terms of skill acquisition [11]. Their sparse contact with care as practiced, means developing skills involved in making care-plans is much easier developed than skills concerning the facilitation of good care. Also this might pose challenges to patient safety.

Conclusion

We see that the delegation of information sharing to the system supports the program of efficiency, while acting as an anti-program to the program of quality. This is caused by sparse and limited contact with care as practice, and poses challenges to practice and hence also reduces efficiency. We therefore observe that one challenge of patient safety, the one of information safety, is exchanged for another, the one of lacking awareness of and access to information, thus the opposite was the intention.

Returning to our initial concern; computer systems within health care that tend to deliver less than promised. We see in this case that the system reduces informal information exchange. Lacking attention to informal processes is easy to understand, since the mapping and development of such information channels are costly.

On this basis we conclude that at least parts of the gap between what is promised and what is delivered by computer systems within health care stem from too little attention being paid to informal work processes during the development and implementation of the system.

References