Normalizing E-messaging in Healthcare: Experiences with Routine Development among Healthcare Workers in Two Municipalities

Line Melby[1,2], Ragnhild Hellesø[1]

[1] University of Oslo, Oslo, Norway
[2] SINTEF, Trondheim, Norway

Abstract. The study presented in this paper addresses the implementation of electronic messaging (e-messaging) in Norwegian healthcare. The aim of the paper is to show in detail how healthcare workers are creative and inventive in their efforts to integrate new technology in their workplace. An important part of technology implementation is the development of routines for using the technology. Drawing on Normalization Process Theory (NPT) we discuss routine development in two municipalities as part of integrating the technology in daily practice. The two municipalities approached the implementation and routine development process differently, and routines evolved over time. We conclude that go detailed into the implementation process when new technology is being introduced is a fruitful intake for understanding how technologies become (or not become) part of normal work practice.

1 Introduction

Communication and information exchange across organizational borders have been – and still is – a challenge that needs to be addressed in order to provide more seamless treatment and care for patients [1]. The increasing number of patients who receive healthcare services from multiple providers across different healthcare organisations implies a need for systems to connect the providers to ensure a seamless service. Norwegian authorities have highlighted that the gaps existing between providers threaten patient safety as well as quality of care [2, 3]. In Norway electronic messaging (e-messaging) has been introduced in order to simplify information exchange and strengthen communication between municipal care services (e.g. home care), general practitioners (GPs) and hospitals. A set of standardized e-messages has been developed to support different aspects of collaboration between healthcare workers (e.g. exchanging medication information and providing update on the patient's health situation). The number of actors who have implemented e-messaging is growing, and in December 2013 261 municipalities (61 %) used e-messaging with GPs, and 173 municipalities (40 %) used e-messaging with hospitals[4].

However, for a technology to be successfully implemented, that is, being routinely used as a part of daily activity, there are many factors that need to be attended to. The implementation literature describes a number of facilitators and barriers to a successful implementation [5, 6]. Such studies may further our knowledge by

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providing a list of factors that are thought to influence implementation processes and their outcomes, but the underlying mechanisms at work are less explained [7]. In order to better understand these underlying mechanisms Normalization Process Theory (NPT) is developed as a theoretical framework that specifies mechanisms of importance in implementation processes [7].

In the current paper our aim is to shed light on parts of the implementation process when e-messaging was introduced in two pilot municipalities in Norway. In particular we investigate users' experiences with establishment and development of routines and guidelines for using the e-message system. By this we address a crucial element of normalization of an intervention, as outlined in NPT.

2 Theoretical Approach

Implementing and embedding new technologies involves complex processes of change on many levels. Normalization Process Theory (NPT) is developed to address these processes, and is concerned with 'how and why things become, or don't become, routine and normal components of everyday work [8, 9]. NPT is concerned with three core problems: Implementation, referring to the social organization of bringing a practice to action; embedding, meaning the processes through which a practice become routinely incorporated in everyday work of individuals and groups, and; integration, which refers to the processes by which a practice is reproduced and sustained in an organization or institution [9]. Furthermore, NPT is operationalized into four generative mechanisms, which are described as interrelated and dynamic:

1. Coherence – a practice (e.g. the use of a technology) is made possible by a set of ideas about its meaning, uses and utility, and by socially organized competencies. These meanings and competencies hold the practice together, and enact it. Through actors' continued collective investment of meaning into a practice, coherence is reproduced over time [8].
2. Cognitive participation – both symbolic and real enrolments and engagements of human actors are needed in order to deliver the intervention and establish a practice. This embedding work involves long interaction chains, which can involve highly focused work or more widespread work, e.g. operationalizing a policy decision in a large organization [8].
3. Collective action – the chains of interactions as described above, are understood to be the site of mental and material work that organizes and enacts a practice. Collective action involves some purposeful action aimed at some goals. Collective action may take form of resistance, subversion or reinvention, as well as affirmation and compliance [8].
4. Reflexive monitoring – Patterns and outcomes of collective action are continuously evaluated by participants in the implementation process. Both formal and informal monitoring (evaluation) take place, and involve making judgments about the utility and effectiveness of the new practice [8].

Following NPT, it means that if we want to understand how e-messaging becomes embedded and integrated into homecare nurses' and GPs daily practices, we need to study the four above mentioned factors. In this paper we delimit our discussion to points 3 and 4, through a discussion of routine development. Routine development is important parts of both 3 and 4. It can be seen as collective action that brings the intervention to use. And the refinement of routines - as experiences with the intervention (e.g. e-messaging) increase – can be seen as parts of the ongoing process of adjusting the intervention.

3 Methods and Material

The current study is part of a larger study (Bridging the information gap in patient transition [BIG]) on the introduction of e-messaging in Norwegian healthcare and how this technology affects information exchange, communication and collaboration between homecare, GPs and hospitals.

Two of the municipalities that were among the first to implement e-messaging in Norway were strategically chosen for this study because the involved GPs and homecare nurses had the most experience with the use of e-messaging. At the time of data collection users had approximately experience from 6 months of use. Furthermore the two municipalities represented diversities in size, organization as well as geographical location which ensured maximum variation [10].

Data was collected through open-ended interviews. In total, 43 persons were interviewed: 23 nurses, 11 GPs, 5 medical secretaries and 4 project managers. In the interviews informants were asked about development of routines and guidelines for use, their experiences with them (if any) and the need for further development of routines. All informants therefore address this issue. Interviews were transcribed *ad verbatim* by a research assistant.

Data was analyzed using a stepwise deductive-inductive approach (SDI) [11]. Such an approach means switching between being deductively informed; departing the analysis from a theoretical perspective – and working inductively; letting the empirical material guide the analysis. Concretely, we read through the data transcripts independently several times. We agreed that the main theme 'the implementation process' and the sub themes 'development of routines and guidelines for use' were themes we wanted to pursue. After reviewing research literature, we agreed that NPT was a fruitful perspective to consider our findings in view of. We read through the interview transcripts again, but now with the concepts developed in NPT as a backdrop. We thereafter decided to present empirical examples of the routine development process from homecare staff in two municipalities, as well as from GPs' perspectives.

All participants gave their informed consent. The study was approved by the Norwegian Social Science Data Service.

3.1 The e-Message System

The e-message system we studied was developed as a module that can be integrated with the different electronic patient record (EPR) systems in use in Norway. There is substantial variation in EPR systems. Homecare services throughout the country use three different EPR systems, GPs use another four (and different versions of EPR systems), and hospitals use another two EPR systems. These systems are not integrated. Therefore, information cannot automatically be exchanged between them. However, by using the e-message system, users can exchange some of the information stored in the record system. When composing a message, a user can retrieve some of the content of the message directly from the EPR. Thus, it is not necessary to re-type information. Furthermore, information contained in a received message can be stored in an EPR. This integration of the e-message system with different EPRs facilitates the implementation of the legal requirement that patient information must be exchanged when necessary [12].

The e-messages are sent via a national closed and secure health net. The health net is a basic electronic infrastructure, which is used exclusively to transmit health information [13].

In the development of the e-messaging system, no comprehensive set of national guidelines were developed. It was stressed that the various municipalities and end-users should have influence over the organization of using the system.

4 Results

Both similarities and variations in experiences among the participants were identified. In both municipalities there were explicitly formulated descriptions for how healthcare workers should work with e-messages. However, the informants were not always aware of these plans and guidelines (e.g. that e-messages should be responded to within three days).

In general, users points of views ranged from those who thought the system was so simple to use that hardly any effort was needed for making the system work efficiently (meaning that routine development not was considered important), to those who complained about a lack of routines. The majority expressed opinions somewhere in the middle. This group was aware of the existence of guidelines for use, but thought they were insufficient and that it was necessary to further develop them based on their experiences with e-messaging.

We found that in none of the municipalities GPs' medical secretaries were trained or explicitly informed about the e-message system. Some were though by coincidence present at the time when GPs received training and information, and had picked up something about the system. Medical secretaries had prior to the introduction of e-messaging played a role as mediators and gatekeepers for the GPs vis-à-vis the homecare nurses. As a result of starting up with e-messaging for direct communication between the GPs and homecare services, secretaries found themselves less involved in the communication. This was also underscored by their lack of inclusion in training and routine development.

To exemplify how routine development differed and evolved across actors and organizations, we present a concrete case for illustration (see Table 1). One of the core features that needed to be addressed when introducing e-messaging was how healthcare workers would make sure incoming e-messages were read and followed-up. Table 1 shows the official policy from the municipal administration, how the routines functioned and were interpreted at the local level, and how routines were revised.

	Municipality A	Municipality B	GPs
Municipality's policy	Each nurse is herself responsible to check for messages and follow them up. No 'message responsible' person	A 'message responsible' nurse appointed in each home care unit. Written routines describe e.g. that one must check for e-messages min. once a day and distribute them to the appropriate colleague	No official policy, except that a message must be processed within three days after receiving it
Ex. Local practice	Some home care units had right after start on own initiative appointed a 'record responsible' nurse that would monitor incoming e-messages, and inform colleagues about unprocessed e-messages	Due to several reasons some 'message responsible' would not always check for messages. Consequently, messages was never distributed to a nurse that would process it	Holidays actualized the need for letting co-workers have access to e-messages sent to a GP. Some GPs were well prepared and used the EPR system's 'absence assistant' to distribute messages to a colleague. Others were less prepared and messages were left in their inbox for a long time
Revised routines	The function of a 'record responsible' was dismissed after a while, because most nurses would anyway check for messages several times during the day	The 'message responsible' function did not work properly, and a common 'message central' was established in the municipality that would monitor all messages, distribute them and follow up that they were answered	The GPs who did not have a routine for dealing with absence from work established these. Some GP offices would e.g. activate the 'absence assistant' after one week of absence, others earlier

Table 1: Illustration of development and differences in routines

Municipality A and B started out with different routines for keeping track of incoming e-messages, of which neither complied completely. In municipality A nurses were afraid of missing incoming e-messages and by own initiative assigned the role of a "record responsible" to specific persons. One nurse explained: *'When you have the 'first on-call list' you read all messages, 24 hours backwards. But today I have only a regular list, and then I just read messages for the patients I am assigned to'*. In another homecare unit, another nurse told how they also had started out with this practice, but it had gradually changed: *'In the beginning…then a 'record responsible' was appointed to check for e-messages. Were there any messages not addressed? And she was also responsible for printing them out, to be sure that someone followed up*'. But she continues to explain that the practice had been discarded, because *'the one who has sent an e-message is very curious about when an answer will come, so e-messages are always noticed'*.

In Municipality B, the guideline stated that 'message responsible' nurses should monitor the homecare units' incoming messages and distribute them to a nurse that

had sufficient patient knowledge to process the e-message. As such, an additional actor between the sender (the GP) and the receiver (the nurse) was introduced. Adding this extra person can imply quality insurance of the communication process, but it can also make communication more complicated. The intention from the central municipality was to secure high-quality message handling, but the practice was not an entire success. The 'message responsible' nurses were not always present in the office, which made monitoring of incoming e-messages impossible. There was also a lack of follow-up from nurses from different reasons.

For the GPs after some time's experience with e-messaging they developed various routines for dealing with absence was introduced.

5 Discussion

Research, as well as NPT, stresses that development of guidelines and establishment of routines are crucial for integrating and making a new technology a regular component of everyday work [8, 9, 14]. In our study we have investigated the development and refinement of routines as healthcare workers become more experienced users of e-messaging.

Our study illustrates the variation of routines and guidelines for using e-messaging among different organizational units. In turn this reflects how centrally formulated guidelines are subject to local interpretations and adaptations in the different homecare units. The study highlights how healthcare workers are creative and inventive in the process of embedding and integrating a new technology.

NPT describes collective action as both mental and material work that is about organizing and enacting a practice [8]. The case of municipality A illustrates this. To embed a new technology into practice requires mental work, either it be affirmation and compliance to a rule or reinvention as in this case. Likewise, it requires material work. In the current study the material work is distinctly illustrated by the work assigned and conducted by the 'record responsible'. Along with increased experiences of the nurses, nurses in municipality A dismissed the routine because they no longer thought it was needed. In NPT reflexive monitoring refers to the process of continuous evaluation of the patterns of collective action and their outcomes. It may involve judgments about the utility and effectiveness of a new practice [8]. In the case of Municipality A, nurses evaluated the practice of appointing a 'record responsible' nurse, found it to be of no use, and returned to the municipalities guidelines of individual responsibility for checking e-messages.

Seen from the NPT perspective, we can say that for municipality B the newly introduced practice did not align well with already existing practices in the home care units and the routine was not embedded in the organization [8]. In NPT the collective action mechanism is divided into four constructs, where 'relational integration' is of them [8, 15]. It refers to the impact of the intervention on relations between different groups of professionals. A positive development of the relational integration is more likely if the technology (or other intervention) does not disrupt current lines of responsibility and accountability [15]. In Municipality B disruption of the existing division of responsibility was exactly what occurred. Nurses who previously had

overview over - and were responsible for - 'their own' patients were after the introduction of e-messages dependent on the 'record responsible' nurses to mediate e-messages to them. And opposite; 'record responsible nurses' had to take responsibility for actions they previously were not responsible for. In total, this solution was not successful, and the municipal administration changed the routines for addressing incoming e-messages.

The GPs and their secretaries are the third group that needed to develop routines for e-messaging. GPs are self-employed, and the municipalities have no direct steering over them. This means that GPs more than homecare nurses were left to themselves to embed and integrate the e-messaging into their practice. The example shown in the result section refers to the need for dealing with absence. How would GPs maintain their e-message communications while away from the office? All GPs in our sample worked in co-working spaces with several GPs. The development of GPs routines exemplifies the reflexive monitoring process – the ongoing adjustment of the intervention - that NPT proposes [8]. Along with growing experience and trial and error for solving the challenge of dealing with absence related to e-messaging, the various GP offices developed and refined their routines. At the time of the interviews GPs were overall satisfied with routines for addressing absence. However, it should be mentioned that multiple routines in different organizations, and blurred boundaries for defining responsibilities between the collaborating partners may impact patient safety and quality of care [16].

6 Conclusion

In this paper we have discussed the development of routines as part of normalizing e-messaging in healthcare. In particular we have shown how homecare staff and GPs in two municipalities revised and integrated routines for dealing with incoming e-messages. Studying the development of routines and guidelines following the introduction of new technology give us a fruitful intake for understanding how new technologies become part of normal work practice (or not). It is also useful for understanding all the work involved from the ones exposed to the technology, in order to routinely use it.

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