

Electronic Prescriptions: A case study

Eli Larsen

Norwegian Centre for Integrated Care and Telemedicine

eli.larsen@telemed.no

Abstract. This article sheds light on the effects of three different strategies that Norwegian authorities have adopted in order to enroll vendors in the task of establishing a new national electronic service for healthcare. The case description highlights how the vendors responded when the authorities needed integration between the new service and the information systems that doctors use in their daily work.

Introduction

There is a good deal of interest in controlling the development of information systems within healthcare (Mundy and Chadwick 2004; Salmivalli 2006; NEHTA 2009; Nictiz 2010). Economic analyses that predict expected benefits are probably necessary in order to secure government financing; due to the substantial funding required, the authorities will keep tabs on the development process.

An empirical study was carried out within a large-scale national information- and communication technology (ICT)-project in Norway that aimed to establish electronic prescriptions as a routine service. The new service aimed to replace paper prescriptions by electronically sending prescriptions from the prescribing doctor to a prescription database that the pharmacy could access. The project, ePrescription, was managed by the Directorate of Health and carried out with involvement from users' interest groups. However, the project's success was dependent on cooperation with vendors, which leads to the research question: What was the effect of the strategies authorities used to involve the vendors?

Theoretical framing and methods

In the past decades, Western healthcare systems have established information systems, software tools, and system functionalities that have been integrated into a complex information infrastructure. The definition of this structure, according to Hanseth and Lyytinen (2004) is a shared, evolving, heterogeneous installed base of information technology capabilities among a set of user communities based on open and/or standardized interfaces. This means that new electronic services have to adapt to the existing structure. Patient records are one of the most significant building blocks in healthcare information systems (Timmermans and Berg 1997),

and the electronic patient record (EPR) has therefore captured “pride of place” in healthcare information infrastructure.

An interpretative methodological approach (Walsham 1995) has been used, and the empirical material was gathered through a longitudinal process that started in Norway in 2004 and continues today.

The following data input has been gathered: 1) Strategic documents for ICT within Norwegian healthcare from 1997 until today; 2) Project descriptions; 3) Evaluation reports concerning electronic communication within the health care sector; 4) 40 semi-structured interviews with the key actors involved in governmental projects, representatives from the public authorities, and general practitioners (GP)s; 5) 80 hours of non-participant observation during weeks 1 and 3 of pilot-testing.

Case

The Norwegian Ministry of Health and Care Service initiated a project in 2005 in order to establish an electronic prescription service that replaced paper prescriptions with electronic prescriptions. The most pressing argument was that the authorities needed a copy of all refundable prescriptions that were handled by the pharmacies. The electronic prescription service was to be developed as an integrated part of the information systems that already existed in the pharmacies and the GPs' offices. The project had a generous budget at its disposal and was considered the most important project in its domain. The high profile of the project caused considerable pressure to deliver result within deadlines.

Strategy 1: “Join us, but pay for most of it yourself” (2005 – 2008)

Prescriptions were supposed to be tightly integrated with EPR functionality; hence, the six major vendors of EPRs were invited to participate in the project in 2006. The ePrescription project had a generous budget, but the money was mainly for running the public part of the project, not for paying the EPR vendors.

The three vendors of the hospital-based EPRs demanded more-detailed requirement specifications before they were willing to start development, and the development of electronic prescriptions in the hospital sector was put on hold.

Two of the three vendors providing systems to GPs declined to participate because they were developing a new EPR, and their development departments were limited and were not able to cope with the amount of work that the ePrescription functionality represented. The third vendor (with a market share of about 75% of the GP market) agreed to develop a pilot version. The vendor was finally able to negotiate a payment that corresponded to 50% of the stipulated development costs. The ePrescription was integrated with a completely new EPR that the vendor developed, but unfortunately the vendor did not have time to test it sufficiently in-house. This caused trouble for the pilot users, who received too much experimental software to test in a busy working environment. The pilot was

characterized as a “living hell” in the Norwegian media and was aborted after only three months.

Strategy 2: Full payment (2008 – 2009)

After the catastrophic pilot test of the ePrescription system in 2008, the project faced a situation in which the only vendor willing to provide integrated ePrescription functionality had failed. The multimillion dollar, top-priority project was about to come to a complete halt. In order to tempt the other two EPR vendors in the GP market, payment for integration was increased dramatically:

Only a few days after the termination of the pilot in Stor-Elvdal, we received a telephone call from the Directorate – this time with a payment that met our needs. We have never experienced a public project with an offer like that! We were able to hire two extra programmers and were able to carry out the integration within a relatively short while. [EPR vendor]

In 2010, a new pilot test took place, with a more positive result. The GPs struggled a bit, but the problems were overcome. However, the signing process was more bothersome than it had been previously and typically took longer to complete, so doctors had to work an extra half-hour or more each day. Nevertheless, the ePrescription functionality was refined, and the extra work was minimized.

The electronic prescriptions were sent directly from the GPs’ offices to the ePrescription database, and the patients did not pay anything for the receipts. This was unlike the process that was established for the paper receipts because the patients had to pay for these in the GPs’ offices. As a result, the workload for secretaries in the GPs’ offices was reduced.

Strategy 3: Free integrated ePrescription unit (2010 – 2013)

The two EPR vendors who carried out the integration of ePrescriptions served a total of approximately 25% of the EPR market among GPs. Considering that the hospital sector prescribes 20% of prescriptions and the largest GP vendor had not provided a functional solution, the project was far from the goal of having all prescriptions processed electronically by 2010. The Directorate of Health chose to develop a program unit that could operate in addition to the EPR. This unit could then be used by EPR systems that had not made a tailored solution. The contract for program development was put out on a bid for tender, and a foreign company got the job. The hospital sector was wary of using the free ePrescription module in combination with their EPRs and therefore developed integration solutions themselves. However, the largest GP vendor included the free ePrescription unit in its EPR system and spread it throughout Norway on a schedule decided by the Directorate. By February 2013, almost all GPs were able to process electronic prescriptions.

The GPs who used the EPR system with the foreign program unit experienced a lot of trouble when they started to use the new installation. Not only was the

prescription processing bothersome, the entire EPR became slow and unpredictable:

Today I had to restart my computer several times because my EPR crashed. Each reset takes about 10 minutes and causes a lot of frustration! The prescribing process is extremely cumbersome. Nine of twelve GP offices in our town use the same EPR system as we do, and they all had similar experiences. Since we started to send electronic prescriptions, my workday has become longer, and I am not able to treat patients who drop in without an appointment, as I was able to earlier on. The EPR support centre does not answer when we try to get in touch; I've heard that they have a latency of two hours. [GP]

Despite efforts from the GP vendor, the EPR including ePrescription did not function properly. Some GP offices experienced the changes in their workday to be so bothersome that they reported the situation as a risk for their patients.

Concluding Remarks

The strategies resulted in different degrees of response from the EPR vendors. Full payment (unsurprisingly) sped up the integration process, and the two vendors that developed ePrescription functionality seemed to do a proper job.

The strategy that offered a free integration unit did not provide full integration in terms of information infrastructure theory.

Additionally, it is interesting that the ePrescription service has resulted in decreased workloads for secretaries and increased workloads for doctors. This finding is compliant with Greenhalgh's (2009) systematic literature review.

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