The Pharmacist and the EPS (electronic prescription service)
Extended Abstract

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Abstract

Pharmacists are often the forgotten link in electronic prescription services (EPS), and yet are the point at which the outcome of the system, the dispensing of medication to patients, actually occurs. This paper reports on a study of the attitudes to EPS and implementation of EPS on the ground in UK pharmacies in order to elicit a rich view of the many factors involved in EPS at the pharmacy and how they interact. While some factors are not surprising (security, training, cost, speed), an important finding was the difference between independent and national chain pharmacies.

Introduction and Context

In the UK, the NHS (National Health Service), like all its European neighbours, is in the middle of an extensive process of updating its use of computers in order, it is hoped, to provide more effective and efficient health provision. In the case of the UK NHS this programme is called the National Programme for IT (NPfIT) and includes an online booking system, centralised patient records as well as electronic prescriptions all built on top of a dedicated national secure computer network, N3.

It is often the electronic patient record systems that take central stage in discussions of IT in health provision, both because of their promise and because of their many documented problems! However, electronic prescription systems are also being rolled out in Europe and North America [[D06]], with, for example, even Gibraltar announcing its programme earlier this year [[BJH08]]. Hospitals have used electronic prescription systems internally for many years as have GPs within their own practices, and local initiatives date back in the UK to the 1970s when the Health Centre at Ottery St Mary, Exeter became the first paperless general practice, later connecting into the local hospitals [[B02]]. The difference now is that in the UK, and elsewhere, these are becoming coordinated national systems. The reason for this is partly to reduce errors and costs as prescriptions are transcribed at pharmacies (the days of reading handwriting are already fading as most GPs electronically print prescriptions) and partly to reduce the dangers of fraudulent prescriptions (costing the NHS £70-£100 million a year [[MC02]]). A major benefit will be for repeat prescriptions, which account for 70% of all prescriptions dispensed in the UK.

When thinking about electronic health the focus is typically on clinical staff, and indeed, in the past, and often just doctors (happily with exceptions [[SK00]]). In the UK, the headline figure quoted is typically the number of electronic prescriptions *printed*, which passed the one million mark in 2006 [[NHS06]] – that is the role of the general practice. However, the other crucial actor is the pharmacist and the figures for the numbers of electronic prescriptions *dispensed* is not so often cited in official figures – soon after the 'million mark' announcement it was reported that only 1.5% of these were actually dispensed using EPS [[eHI06]].

Study and Results

In order to examine this forgotten group, a qualitative study was performed looking at the attitudes to EPS and the implementation of EPS on the ground in UK pharmacies. The study involved a combination of micro-ethnography (field visits and interviews) to examine attitudes and use and also standard usability evaluation of examples of systems being used for EPS[1]. The qualitative results were analysed using grounded theory in order to produce a rich view of the many factors involved in the EPS at the pharmacy and the way they interact; figure 1 shows the high-level categories arising form the grounded theory.

Some results are not surprising with fears about system security, and (justified) worries about inadequate training. The latter seemed to be left entirely to the system vendors due, in the view of the pharmacists interviewed, to cost constraints of their local Primary Care Trust (PCT).

> *"Not [been offered training] by the PCT. The PCT have been very quiet. I guess it's cost based."*

Often the negative responses were reduced where EPS was in operation suggesting that perceptions were worse than reality. However, this does not mean that these fears are 'just' about ignorance – part of the effective deployment of any IT system is the *route to use* and that use necessarily and always includes perceptions of potential users; if these are not managed systems fail.

Furthermore, some of the worries concern issues that are intrinsic to digital systems. When doctors sign prescriptions they usually do one last check of what they have prescribed and in surgeries where there are many doctors the prescriptions manager does a final check of the prescriptions before they go to a pharmacy to be dispensed. When using the EPS system prescriptions will be electronically signed and sent to the pharmacy directly, this worried some people as it removed an accuracy check from the prescribing/dispensing process. This is similar to the move of financial systems from paper to electronic recording. Because the paper system was known to be liable to arithmetic errors human systems were put in place to detect errors, notably double-entry book keeping. However, in electronic systems most transactions are entered once only meaning that typing errors may go undetected.

Another story from the implementation of EPS common to many electronic systems is the way in which additional paper systems need to be introduced around the electronic one. To increase security smartcards are needed to authenticate to the system. However, only pharmacists are issued with smartcards, despite the systems actually being used primarily by dispensers and other pharmacy staff, and the PCT suggest the pharmacists keep a separate log of who is using the smartcards and when, often impractical in a busy pharmacy.

An exception where perceptions after use were worse than before was speed. One of the aims of EPS is to improve efficiency, but experience with the dedicated N3 network suggested patchy uptime and slow performance. Whether this is due to the network itself or the back-end systems they connect to is not clear, not whether this is just 'teething problems' or long-term under-capacity, however problems of this kind at a point when the system is only at a very low level of utilisation is worrying. It is interesting to note that recent introductions of EPS in other countries (e.g. Bulgaria, Gibraltar) are using standard internet technology such as VPN (virtual private networks) as opposed to the bespoke solution adopted by the NHS – possibly EPS has adopted a traditional behemoth system style that is becoming outdated?

Perhaps the most interesting result was the difference between smaller independent pharmacies and those that are part of a large national chain. On might imagine that the

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[1] While the EPS infrastructure is standard, individual vendors produce the end-user interface.

former would be less technologically advanced compared to the latter who have the benefit of their own dedicated IT support services. However, the opposite seems to be the case. Where EPS systems were installed in smaller pharmacies they were actually in use, whereas those in the national chains were installed but unused. This reflected directly the reward structure. In order to encourage use pharmacies are paid a monthly sum by the PCT for having an EPS systems installed and available for use. Presumably this 'ready for use' payment was adopted as it would be unreasonable to reward actual use until GPs generally used EPS. The larger pharmacies appeared to 'play the system' installing the systems and performing 'just in time' raining of staff when an inspection visit was due. In contrast, the investment in time and money for a small pharmacy was proportionally greater and so the installed system had to justify itself beyond the PCT payments.

This pattern of use was reflected in a heuristic usability evaluation of a typical large pharmacy vs. small pharmacy system; the latter performing significantly better. This presumably reflects the different procurement strategies with the former, large pharmacies, being procured centrally with little connection with real users, whereas the latter, in the small pharmacies, being procured by those who will eventually use the system. This pattern if use and usability parallels the divide between GP and hospital use of IT systems. The former have often grown organically from systems designed by GPs for their own use and latter 'productised'; in contrast hospital systems have been seen as imposed from above [[B02]].

Workshop Presentation and Full Paper

For the workshop presentation, we will focus primarily on reporting the study and its immediate results. For the longer post-workshop paper, we will additionally reflect on the relation between the snapshot view of EPS seen in our study and general lessons for IT deployment, linking it to more theoretical models of system adoption.

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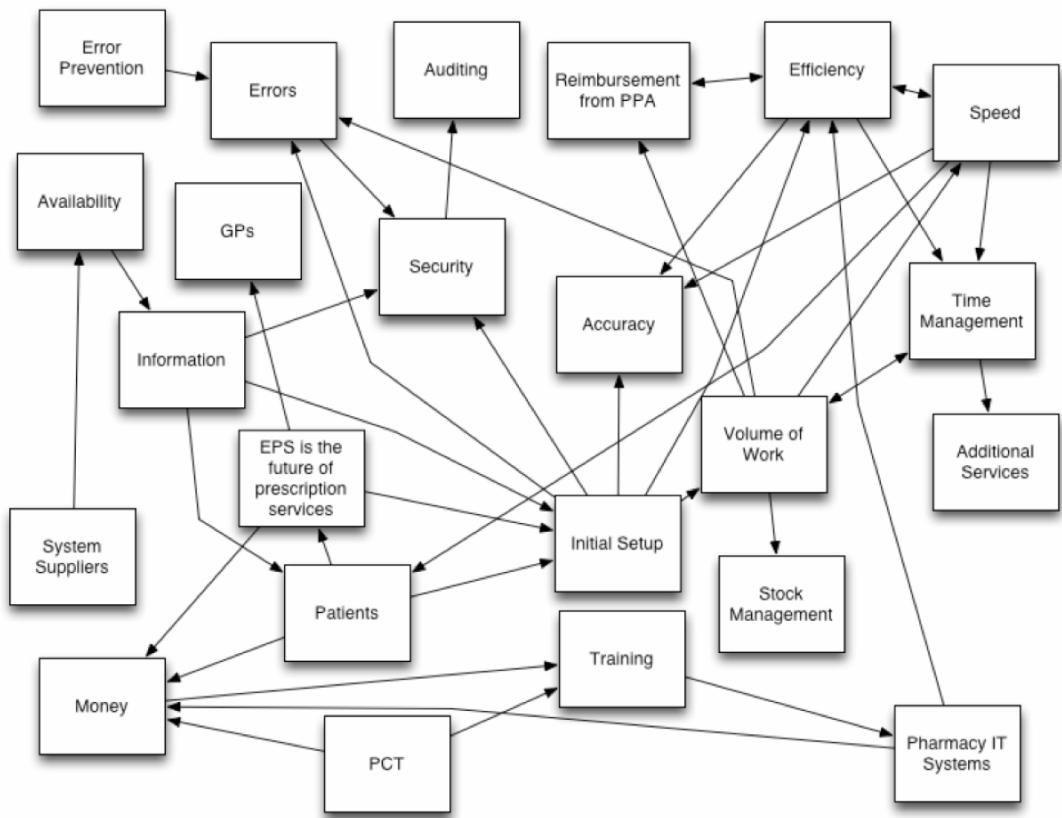
Figure 1. Main categories from grounded theory analysis