

A TECHNOLOGY ACCEPTANCE MODEL FOR INTER-ORGANISATIONAL ELECTRONIC MEDICAL RECORDS SYSTEMS

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ABSTRACT

This article reports the findings of the first stage of an ongoing, longitudinal study into the implementation of an inter-organisational electronic medical records (EMR) system. The study adapted and expanded Davis' (1993) technology acceptance model (TAM) to investigate the attitudes of primary care practitioners towards a proposed system for maternity patients. All doctors and midwives holding maternity care contracts with a large urban hospital in New Zealand were sent a questionnaire soliciting their views on a planned EMR system linking the hospital and the primary care sectors. The results showed that whilst Davis' two key factors of *perceived ease of use* and *perceived usefulness* were important to medical professionals, another key factor, *perceived system acceptability*, which concerns control and management of information is vitally important to the acceptance of the system. The study also showed that the two groups of professionals had differing requirements due to different levels of experience and practice computerisation. Finally, the research highlights a number of wider organisational issues particularly relevant to the use of inter-organisational systems in general and healthcare systems in particular.

INTRODUCTION

For some time now the health sector in developed countries has been seeking to exploit the use of information technology to improve both the quality of care it provides for patients and its organisational efficiency. Within Australia and New Zealand two key strategies have been the introduction of electronic medical records (EMR) systems and improved electronic communications links between the primary care sector and secondary care institutions (NHIMAC, 1999; Ministry of Health, 1996, 2000).

An EMR is an integrated database system that consolidates all information relating to the healthcare of an individual patient. Its aim is to improve the quality of patient care by ensuring that complete and up to date information is readily available to all caregivers (Dick and Streen, 1997). If the system also consolidates financial and costing information relating to the treatment of the patients, then better financial control may also be achieved.

To date, most EMRs have been located in either the secondary, or hospital-based, sector or within GP practices within the primary care sector. Communication between the two sectors has generally been limited to the traditional mechanisms of letters or telephone calls between doctors. This approach has often been criticised for being slow and error-prone (Dansky et al., 1999; Sobel, Alverson and Lei, 1999). Recently, there have been moves to link EMRs across the two sectors in order to ensure a smoother and more efficient transmission of patient related information between sectors (Ministry of Health, 1996, 2000). Whilst studies have shown that EMRs do increase the accuracy and accessibility of patients' records, large scale health information systems have often been fraught with problems (Hannah, 1998; Sicotte et al., 1998). A classic example of this occurred within the British National Health Service when doctors boycotted an inter-organisational network designed to improve the exchange of information on the grounds that it threatened patients' privacy (Davies, 1996; Willcox, 1995). Clearly, user acceptance of planned networks is crucially important in order to prevent the collapse of highly expensive information systems investments.

The literature on health professionals' attitudes towards computerisation suggests that whilst there is an increasing trend towards the computerisation of administrative tasks within both hospital and general practices, many doctors and nurses remain apprehensive about the use of EMRs. They are often unconvinced of the advantages, have severe reservations concerning the privacy, confidentiality and security of data, and often believe that the costs (both financial and in terms of the time taken to learn how to use the system) outweigh the benefits (Thakurdas et al., 1996; Bolton et al., 1999; Sleutel and Guinn, 1999; Tai, Donegan and Nazareth, 2000). Clearly, a hospital based EMR linking the primary and secondary health sectors will not be readily embraced by primary healthcare professionals unless these concerns are addressed. It is therefore important to obtain practitioners' views prior to implementation in order to install a system that meets the requirements of the users.

This article describes the first phase of an ongoing, commissioned, research project investigating the implementation of an EMR system linking the primary and secondary healthcare sectors within the public health system of New Zealand. The planned system will be based in a large, urban hospital and will link the hospital's information system to various primary healthcare providers. Organisationally, the planned system is akin to a large central hub (the hospital) interacting with a substantial number of small, autonomous spokes (the primary care units). Such systems are prone to various technical and organisational problems such as different and

incompatible technologies, inadequate training and support for the small units, different working practices and different attitudes towards computerisation (Munkvold, 1999). In order to try to circumvent later problems, the hospital that is implementing the new system commissioned the researchers to study a pilot project which will link the hospital and primary care providers' EMRs for maternity patients. The maternity EMR will be one of the first systems to be made available to the primary care sector as it is seen to have the potential to offer some important benefits for patient care. The progress of a routine maternity case typically requires the patient to interact with several professionals in both the primary care setting and the hospital. This 'shared care' structure, in which patients are seen by a range of professionals within both sectors has often led to problems as patient records are often incomplete and information may take some time to travel from one sector the other (Kivekas, Hyvarinen and Kinnunen, 1996). Most women then end up arriving at the hospital at some unarranged time when they are already in labour. Easy and prompt access to the patient's case history would therefore improve both the patient's comfort and the attending professional's ability to treat the patient efficiently.

The first phase of this research investigated the opinions and attitudes of primary care professionals towards the proposed system. The aim of the study was to identify those factors that are likely to encourage or inhibit the adoption and use of the system. The findings of this phase will influence some of the details of the implementation process. The second phase of the study will be to monitor the implementation process, while the third phase will be to conduct post-implementation surveys of the users once the system has been running for some time.

THEORETICAL MODEL OF USER ACCEPTANCE

The main purpose of this research was to investigate the attitudes of potential users towards a proposed EMR system. Rather than developing a new model of the factors that influence user-acceptance of information systems, this study adapted Davis' widely used Technology Acceptance Model (TAM) (Davis et al., 1989; Davis, 1993; Venkatesh and Davis, 1996; Lederer et al., 2000) to the healthcare environment. The aim was to use the adapted model as a heuristic to aid the analysis of a particular context. The 1993 version of Davis' model, illustrated in Figure 1 below, proposes that systems design features will influence perceived usefulness and perceived ease of use of the system, and these factors are the fundamental determinants of user acceptance as they influence users' attitudes towards the system, which in turn influences actual system use.

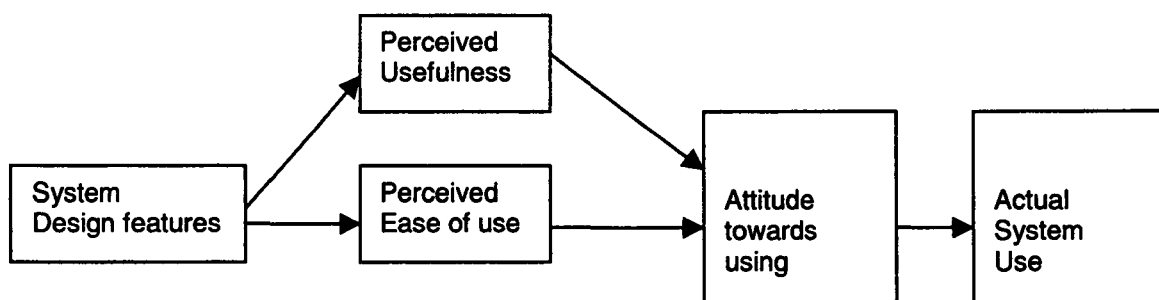


Figure 1: Technology Acceptance Model (after Davis 1993).

Although Davis' model provides a useful and well researched heuristic for analysing the factors which influence users' perceptions of, and attitudes towards, information systems, the model is not entirely appropriate for the current study and it was therefore adapted in three ways.

Firstly, the model has generally been used to investigate the uptake of relatively innocuous systems such as electronic mail and text editors. For such systems, perceived ease of use and perceived usefulness may well be the key criteria which determine system usage. In contrast, the literature on the medical use of information technology suggests that health professionals may refuse to use systems which they perceive as both easy to use and useful, if the system does not deal adequately with critical issues such as the security of information and the potential uses of the information (Thadkurdas et al., 1996). The model was therefore extended to include the concept of "perceived system acceptability" as a separate factor which will influence users' attitude towards the system and their actual use of the system. Examination of the literature on acceptance of EMRs indicated that the key criteria relate to information management issues, such as the classes of people who have access to the system, the type of information entered, the security of information and the uses made of the stored information. A second weakness of Davis' (1993) model is that it simply investigates users' perceptions of system characteristics and does not consider contextual or organisational factors that may influence uptake. Research has shown that whilst factors such as system costs and training and support costs have relatively little influence on end-users in large organisations, where the employer bears the costs, these factors become highly salient in small organisations, such as primary care practices, where users may encounter significant and ongoing personal

costs and frequently lack adequate system support (Zinatelli et al., 1996; Igarria et al., 1997). Many other factors have also been shown to impact on user-acceptance such as management support (e.g. Igarria, 1994) and consultation of users in the development process (e.g. Ives and Olson 1984; McKeen, Guimaraes and Wetherbe 1994). The model was therefore extended to allow organisational characteristics (such as sources of training and support, management support, consultation and level of practice computerisation), as well as system characteristics, to have a direct impact on user attitude towards the system.

Thirdly, individual characteristics of the users, such as age, gender and prior computer experience were also hypothesised as having a direct influence on users' attitude towards the planned system. The revised theoretical model is summarised in Figure 2. The model is intended as a heuristic devise to guide the investigations, it is not intended to be an exhaustive representation of all of the mechanisms that link individual, system and organisational characteristics to users' attitudes.

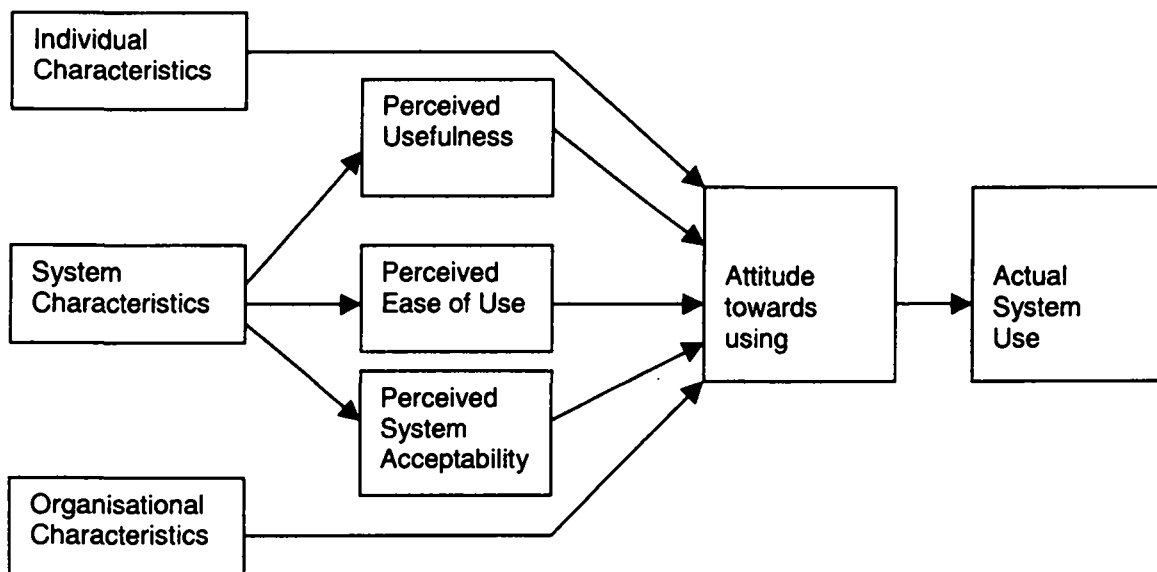


Figure 2: Revised Model of User Acceptance.

In addition to the modification of the basic theoretical model, it was also necessary to use a different research methodology to test the model. Most of the reported work which has tested the TAM has used questionnaires designed to measure users' perceptions of various aspects of a system and the extent of their use of the system after they have some experience of using it. Researchers have then used regression analysis to determine the extent to which the various factors influence the acceptance and use of the system. However, since this research attempts to identify users' attitudes towards the system prior to its final design and installation, the format of the questions had to be modified so that respondents were asked to evaluate the desirability of features of a planned system, rather than to appraise features of a system of which they had actual knowledge. The fact that the system is yet to be implemented, also means that it was not possible to investigate the link between users' attitudes towards the system and actual system usage.

METHODOLOGY

Respondents

All 167 doctors and midwives holding obstetric contracts enabling them to use the hospital were sent a 13 page postal questionnaire concerning the planned EMR system. A total of 51 of the 80 doctors and 51 of the 87 midwives returned usable questionnaires, giving response rates of 64% for doctors and 59% for midwives.

The Questionnaire

The questionnaire was divided into two parts. The first part asked questions relating to the demographic details, computer experience and working environment of the respondents. The second section investigated respondents' opinions concerning key characteristics of the planned system. This section contained five subdivisions measuring respondents' general attitudes towards the planned EMR, the perceived desirability of the three key systems characteristics of perceived ease of use, perceived usefulness and perceived system

acceptability and finally key contextual factors such as preferred sources of training and support. Each subsection contained several items and most questions used response categories anchored to a five point Likert scale, ranging from "strongly disagree" to "strongly agree". Appendix 1 contains the details of the questions that were used, which have been sorted to correspond with the order in which they are discussed in the Results section of this paper. A number of open ended questions were included to gain additional information concerning users' views of the system.

RESULTS

Analysis

Preliminary statistical analysis showed that, with the exception of a few items, there were no significant differences in response patterns associated with the gender, profession or age of respondents. The results presented here therefore apply to the whole sample unless otherwise stated. The detailed findings will now be discussed beginning with the overall demographics and organisational setting. The influence of individual, system and organisational characteristics will then be examined.

Demographic Characteristics and Organisational Setting

The gender distribution of the respondents was uneven with 70 females and only 32 males replying. This reflects the fact that gender was linked to profession, with 61% of the doctors being male and 39% female, whilst 98% of the midwives were female with just one male respondent. Approximately 75% of both male and female respondents were in the 36 to 50 age range.

There was a significant difference in the practice size of the two professional groups ($p < .001$). Midwives tend to work in smaller practices, with a median size of two midwives, whilst GPs generally worked in larger group practices with a median size of five doctors.

There was also a statistically significant difference ($p < .001$) between the number of computerised doctor practices (92%) and computerised midwife practices (33%). However, since practice computerisation, practice size and occupation were all significantly correlated with each other ($p < .01$), it is not clear whether the difference in the extent of computerisation is due to the difference in the size of the practice or the type of practice. This finding indicates that there may be considerable differences in the costs involved in adopting the system for the different practices.

Computers were generally used for administrative rather than clinical purposes with only 41% of doctors and 14% of midwives using EMRs within their practices. The actual experience of both groups with EMRs is therefore limited.

Individual Characteristics and General Attitudes Towards the EMR System

Respondents were asked two sets of questions regarding their general attitude towards the proposed EMR system plus an open-ended question inviting additional comments, the results are summarised in Table 1, below. Eighty five respondents made additional comments which were often negative and sometimes quite lengthy.

	Total no. respondents	%age agreeing (score 4-5)	Mean score	Standard deviation
Perceived competence	101	22	2.81	1.04
Keeness	95	51	3.44	1.13
Apprehensiveness	96	45	3.17	1.29
Use depends on cost	101	91	4.48	.88
Benefits hospital	98	30	3.00	.99
Benefits self	98	85	4.11	.8
Benefits patients	98	92	4.33	.62
Refuse without benefits	99	30	3.01	1.14
Choice important	101	79	4.26	1.03

Table 1: Results of General Attitudes towards the EMR System.

The results indicate a generally low level of confidence concerning EMR use (mean score 2.81) with 78% of respondents indicating that they only felt partially competent to handle the tasks and only 22% feeling competent. Despite the lack of skills, about half of the respondents (51%) were keen to use the system (mean score 3.44) although many (45%) were slightly apprehensive (mean score 3.17). There was a significant negative correlation between perceived competence and apprehension (-.419, $p < .01$) and a negative correlation between keenness and apprehension (-.435, $p < .01$), but no relationship between competence and keenness. This pattern of results suggests that initial training to increase levels of competence may result in less anxiety concerning the proposed system but will not necessarily increase keenness to use the system.

A second set of questions investigated the conditions under which the respondents would be willing to use the system. Respondents were very clear that their agreement to use the system was dependent on the personal costs to them in terms of time and money (mean score 4.48, 91% in agreement), with 85% of respondents requiring demonstrable benefits for themselves or for their patients before they would agree to use the system. Only 30% of respondents were willing to use a system whose primary beneficiary was the hospital.

It is also clear that it would be difficult to impose the use of the system. Many respondents (79%) indicated that it was important to them to have a choice about using the system and 30% indicated that they would refuse to use a system without demonstrable benefits even if its use was part of a contract.

System Characteristics Influencing Attitude Towards Using the EMR.

This section examines respondents' attitudes towards the system design features of perceived ease of use, perceived usefulness and perceived system acceptability, all of which are hypothesised as being important to user acceptance.

Perceived Ease of Use.

The results strongly support Davis' contention that perceived ease of use influences user acceptance with over 90% of respondents agreeing that they would be more likely to use an EMR that was simple to use. The results, summarised in Table 2 below, also indicate that respondents considered all of the facets of ease of use scale to be important, the system should therefore be clear, easy to remember, always available, user-friendly, and easy to learn.

	Total no. respondents	%age agreeing (score 4-5)	Mean score	Standard deviation
Use if easy to use	100	93	4.59	.85
Facets				
Clear	99	99	4.89	.35
Easy to remember	98	99	4.81	.42
Always available	98	96	4.78	.63
User-friendly	99	93	4.64	.61
Easy to learn	98	96	4.62	.68

Table 2: Results for Perceived Ease of Use.

Perceived Usefulness

According to Davis (93) perceived usefulness measures workers' perceptions that the system improves their performance or offers other work advantages. Three different facets of system usefulness were investigated: firstly, the ability of the system to improve patient care, secondly, the ability of the system to simplify or diminish respondents' work and thirdly, the ability of the system to provide documentation that is acceptable within the legal arena.

Eighty nine percent of respondents agreed that they would be more likely to use a system that they perceived as being useful. The results, summarised in Table 3 below, show that while the first two facets are likely to have a strong influence on system uptake, the administrative and legal advantages of the system were less important.

	Total no. respondents	%age agreeing (score 4-5)	Mean score	Standard deviation
Use if improve performance	99	89	4.51	.84
Work quicker	99	97	4.70	.56
Improve quality	99	95	4.66	.61
Improve communications	99	93	4.59	.62
Improve seamlessness	99	91	4.56	.66
Use if offer advantages	100	93	4.57	.79
Decrease work	98	97	4.71	.61
Work easier	99	97	4.68	.62
Meets goals	98	96	4.68	.55
Protect against litigation	99	94	4.64	.60
Hold people accountable	99	77	4.2	.88
Useable in court	100	68	3.81	1.05

Table 3: Results for Perceived Usefulness.

Perceived System Acceptability

Certain key characteristics of the system are postulated to have a significant impact on users' perceptions of the acceptability of the system, these perceptions will in turn impact on their attitudes towards using the system. Four key dimensions of perceived system acceptability were examined, namely, the classes of people who have access to the system, the type of information entered, the security of information and the uses of the stored information. Items in this section were designed to identify acceptable boundaries for these dimensions. The respondents were also asked to indicate their probable course of action if they perceived the system to be unacceptable in some way. The results of both the quantitative measures, summarised in Table 4 below, and the many comments written in the qualitative section of the questionnaire indicate that this is a highly salient issue for respondents.

The classes of personnel who have access to the system was an important issue with nearly 90% of respondents favouring differential access to both the system and data contained within it. Essentially, respondents felt that access to health information should be restricted to medical professionals directly treating the patient.

Whilst nearly all respondents felt that relevant obstetric and general medical information should be entered into the system and therefore accessible by other users. There was less consensus regarding areas such as mental health, sexual health, termination of pregnancy or social history, with only 60% to 75% of respondents supporting the inclusion of these factors.

Over 90% of the respondents agreed that they would need to feel confident that stored data was both secure and accurate before using the system. Issues of patients' consent to having their records placed in the EMR and concerns over who would have final ownership of the information were less salient but still important to 76% and 68% of respondents respectively.

The various potential uses of stored information also concerned respondents. Unsurprisingly there was strong support for using the information for patient care, with nearly all respondents indicating that this was an acceptable use. There was much less certainty about using information for audit, research or teaching purposes, with only 66% to 73% of respondents finding these uses to be acceptable. The use of the information for legal, administrative or financial purposes was acceptable to only 50% or less of the respondents.

	Total no. respondents	%age agreeing (score 4-5)	Mean score	Standard deviation
Access				
Differential access	98	89	4.47	.81
Hidden data	100	87	4.52	.99
Free access	99	24	2.45	1.29
Information types				
All obstetric	99	95	4.76	.57
Medical	98	93	4.55	.79
Mental health	99	69	3.95	1.14
Social history	99	73	3.86	1.20
Sexual health	99	63	3.76	1.24
Terminations of pregnancy	99	62	3.73	1.20
Information Management				
Secure	101	91	4.5	.83
Accurate	101	91	4.5	.81
Patient consent	100	76	4.15	1.02
Ownership	98	68	3.98	1.05
Uses				
Patient care	98	90	4.57	.67
Audit	99	71	3.94	1.09
Research	99	73	3.90	1.04
Teaching	99	66	3.78	1.07
Legal	98	56	3.65	1.13
Administrative	98	52	3.47	1.10
Financial	98	49	3.46	1.07

Table 4: Results for Perceived System Acceptability.

Respondents were then asked to indicate their probable courses of action if they perceived the system to be unacceptable. Eighty two percent of respondents indicated that in some circumstances they would only enter limited and incomplete information into the system and they would then pass on sensitive information using the telephone or face to face communication. These findings indicate that information management issues are crucial to the success of the system since many respondents indicated that they would boycott all or part of a system which they found unacceptable.

Implementation and Support

The final section of the questionnaire examined issues related to the planning, implementation, maintenance and support of the system. The results of this section are consistent with previous research which suggests that involvement of end-users in the planning stage and the provision of good maintenance and user support systems greatly increases user acceptance of a new system (Bowns et al., 1999).

Most respondents (87%, mean score 4.38) agreed that end-user participation in the initial system design would incline them to use the system. However, both doctors and midwives were strongly in favour of having a representative from their own professional group participate, suggesting that where end-users belong to distinct professional groups it may be important to involve representatives of all the groups during the planning (see Table 5 below).

	Total no. respondents	%age agreeing (score 4-5)	Mean score	Standard deviation
Participation				
End-user Participation	99	87	4.38	0.89
Participation by doctor	97	52	3.45	1.18
Participation by midwife	38	53	3.32	1.14

Table 5: Results for Consultation Variables.

Nearly all respondents felt that the costs of providing training and support should be borne by the hospital rather than by them personally. There was considerable variation in respondents' preferred supplier of training and support. The 85% of doctors and midwives who were members of the Independent Practitioner Association (an umbrella association of practitioners within a geographical area which co-ordinates their work, provides centralised services and negotiates with the government for payments) preferred training and support to be provided by that organisation, whereas non-members preferred the services to be provided by the hospital (see table 6 below). These responses highlight the importance of considering not only the technical characteristics of the system, but also organisational politics and professional loyalties when implementing information systems.

Membership of Primary Care Org.		Preferred Supplier			
		Hospital	Primary Care Org.	Independent	Total
Members	Support	12	53	10	75
	Training	7	57	15	79
Non-Members	Support	11	0	4	15
	Training	12	0	4	16

Table 6: Results of Preferred Sources of Training and Support.

DISCUSSION

For many years now it has been recognised that information systems which are technically adequate often fail because of a lack of user acceptance. Proponents of Soft System Methodologies (e.g. Checkland and Scholes, 1990) have long argued that the technical aspects of an information system cannot be considered in isolation from the social and organisational context in which the system is embedded since the social and the technical systems influence each other in a reciprocal manner. Failure is particularly common with complex inter-organisational systems or distributed systems, such as the proposed system, which link either different organisations or different branches of the same organisation. Such systems are prone to various technical and organisational problems such as different and incompatible technologies, inadequate training and support for the small units, different working practices and different user attitudes towards computerisation. (Bensaou and Venkatraman, 1996; Meier, 1995).

When planning the implementation of EMR systems it is important to consider the unique characteristics that arise from the healthcare context and the inter-organisational nature of the project. The results of the study indicate that each of the features that were identified in the theoretical model, outlined in Figure 2, are likely to have a strong influence on user acceptance of the proposed system. Each of these issues will therefore need to be addressed in the design of the system and in the planning of the implementation process.

At the individual level, the age profile of the respondents means that, in contrast to younger doctors or nurses currently in training, they will not have received much formal computer training during their professional education (Kidd and McPhee, 1999). This is reflected in their relatively high levels of apprehension regarding the proposed system and means that the provision of high levels of support during the initial introduction of the system is likely to be crucial to the system's acceptance.

In terms of systems design it is clear that Davis' two factors of *perceived ease of use* and *perceived usefulness* are crucial to user acceptance. Interestingly, many of the most negative comments in the qualitative section of the questionnaire came from G.P.s who had prior experience of EMRs within their own practices and who felt that such systems were more time-consuming and rigid than paper based records. Sobel, Alverson and Lei (1999) explained a similar pattern of responses by suggesting that old style, chronological, paper records provided practitioners with a rich and flexible source of tacit knowledge which an experienced professional can sift through and interpret very rapidly. Such information can be difficult to enter into some of the more rigidly

codified EMR systems with the result that practitioners experience them as less satisfactory. This implies that there is still much work to be done to improve the interfaces to EMRs.

In terms of system design, it is also clear that Davis' model needs adapting to take into account *perceived system acceptability* characteristics, such as security and use of the data and clear identification of appropriate user-groups. The results clearly show that the respondents had varied opinions about the types of information that they were prepared to share via an EMR and the appropriate uses of information. Knowledge of these opinions will enable the systems implementers to enhance the perceived acceptability of the system by introducing appropriate limits on the uses of information. However, even where these constraints are in place, the data within the EMR is likely to remain incomplete in some respects, as many respondents will still rely on verbal communication to relay sensitive social history data.

These findings suggest that considerable attention will need to be paid to ensuring that health professionals find the EMR system easy, effective and acceptable to use from the start of the project. Since I.T. staff and medical professionals often have differing perspectives on systems design it may be useful to involve potential users in the planning and implementation phases of the project in order to ensure that the system meets end user requirements.

At the organisational level, the different levels of computerisation of the two professional groups and the multiple, incompatible technologies that are in use within different practices will have an impact on the costs of adopting the system and the level of support required for different types of practice. Resolving the issue of who will pay for new technology and user support is crucial to the success of the system.

In conclusion, this study has highlighted a number of specific organisational and system design issues that the hospital will need to resolve if the proposed EMR system is to be successfully implemented and adopted by the target groups within the primary care sector. The study provides strong support for the modification of Davis' technology acceptance model to include the concept of *perceived system acceptability*. It is clear from these findings that information management issues such as confidentiality, security and data quality are crucial factors in the acceptance of inter-organisational systems within the healthcare setting. Although the study has focused on the healthcare sector, it is likely that similar issues will arise in a wide variety of other inter-organisational systems.

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APPENDIX 1. QUESTIONS USED IN THE SURVEY

Questions used response categories anchored to a five point Likert scale, ranging from "strongly disagree" to "strongly agree" unless otherwise noted.

Individual Attitudes – Table 1.

How would you rate your current level of computer competence

(scale: not at all competent to very competent)

I am keen to use an EMR

I am apprehensive about using an EMR

My willingness to use an EMR will depend on the perceived personal cost (time or money)

I would use an EMR with demonstrable benefits only for the organisation

I would use an EMR with demonstrable benefits for myself

I would use an EMR with demonstrable benefits for my patients

I would refuse to use an EMR if there were no demonstrable benefits, even if it were part of a contract

It is important to me that I have a choice about using the EMR

Perceived Ease of Use – Table 2.

I would be more likely to use an EMR if it were easy to use

an EMR that is clear and understandable would be easier to use

an EMR that was easy to remember how to use would be easier to use

an EMR that could be access whenever one wants, not just at set times, would be easier to use

an EMR that has a user-friendly interface (Windows-type) would be easier to use

an EMR that is easy to learn would be easier to use

Perceived Usefulness – Table 3.

I would be more likely to use an EMR that I thought would improve my work performance

an EMR that enabled me to work more quickly would be useful

an EMR would assist in improving quality of patient care would be useful

an EMR that assisted in improving communication and information sharing (between primary and secondary care) would be useful

an EMR would assist in improving seamlessness of care (between primary and secondary care) would be useful

I would be more likely to use an EMR that offered advantages for my work

an EMR that decreases the workload and/or pressure on myself and my practice would be useful

an EMR that makes my job easier would be useful

an EMR that meets the goals/needs of myself, my patients, practice, population would be useful

I would be more likely to use an EMR that helps to protect against medical litigation

An EMR that can hold anyone who makes any changes accountable for those changes would be useful

An EMR that was acceptable in court in the place of paper records would be useful

Perceived System Acceptability - Table 4.

Access

There should be different levels of access for different groups of people, ie.: health professionals, administrative staff, etc

Certain information should be 'hidden' from general access, ie.: sensitive issues like HIV results, mental health records, etc

Anyone with a legitimate reason to access the EMR should be able to access any information they feel relevant for their reason

Information types

What information you feel should be transferred to/from an organisation-wide EMR:

Clinically relevant obstetric information

Past medical and surgical history

Mental health consultations

Personal and social history, such as marital status, smoking, alcohol, drug usage

Sexual health consultations

Termination of pregnancy details

Information Management

that the data is secure and confidential will make me more likely to agree to use an EMR

that the data is accurate and factual will make me more likely to agree to use an EMR

that there is patient consent (to put their information on the EMR) will make me more likely to agree to use an EMR

that there is obvious ownership of the data will make me more likely to agree to use an EMR

Uses

The information within an EMR should be used for clinical patient care

The information within an EMR should be used for audits

The information within an EMR should be used for research

The information within an EMR should be used for clinical teaching

The information within an EMR should be used for medico-legal purposes

The information within an EMR should be used for administration, such as bed occupancy figures, staffing levels.

The information within an EMR should be used for financial considerations, such as budgeting, contracting, managed care

Consultation Variables – Table 5

I would be more likely to use an EMR that I, or a member of my profession, had been consulted about

Having a GP representative participate in the development of the EMR will make me more likely to agree to use an EMR

Having a midwife representative participate in the development of the EMR will make me more likely to agree to use an EMR

Sources of Training and Support – Table 6

Please rank, in order of preference, your preferred choices for the provision of EMR support in the left-hand column and for EMR training in the right-hand column.

1= most preferred

2= less preferred

3= least preferred

EMR support		EMR training
	Secondary health care institution	
	Primary health care organisation	
	External agencies/vendors/etc	