A New Approach to Clinical IT Resistance: The Need for Information Technology Confidentially and Mobility

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Abstract

Information technology adds considerable value to modern organizations and healthcare is no exception. Information technology plays a major role in the financial viability of healthcare organizations, like hospitals, but while it is indispensable for hospital administration, the penetration of IT in clinical areas has been low. Although the administrative side of healthcare enjoys considerable computer support, the clinical side does not. Yet data on clinical errors of patient care, such as incorrect medical dosages, or even treatments, suggest automatic patient data processing could be beneficial. Electronic communication could make available critical health information that is currently often absent. To improve healthcare computer integration in the current U.S. e-health

initiative, clinical IT support is a key area. But clinical healthcare providers often resist IT support. This has been attributed either to medical conservatism, the lack of IT ease of use, or both. However, doctors and nurses often use complex medical equipment, and in healthcare laboratories they have readily accepted computer support. We suggest a more valid reason for IT resistance may be that clinical healthcare has unique requirements, specifically data confidentiality and data mobility. The difficulty of combining these criteria in a single IT product may explain why clinical healthcare lags considerably behind administrative healthcare in IT support.

1. Introduction

E-Health can be viewed as a new paradigm for healthcare information management, encompassing both processing and telecommunication technologies (Tan, 2005). Advances like e-prescriptions; telemedicine, strategic healthcare planning, and e-health practitioner to individual records are behind this multidisciplinary shift. The E-Health Initiative places emphasis on improving the quality, safety, and efficiency of healthcare by leveraging information technology (E-Health, 2006). Most clinical records are currently fragmented across multiple paper sources, and they are not available when needed has major impacts on patient care and safety, including premature deaths, impaired lives and longer hospital stays. The needs for clinical IT adoption are summarized in Figure 1.

The problem is exacerbated by the growing complexity of IT, an increase in chronic conditions, a poorly organized delivery system, and legal and other social constraints on exploiting the information technology revolution (Institute Of Medicine, 2000, 2001). Yet that healthcare delivery has been relatively untouched by the revolution in information technology that has transformed nearly every other aspect of society is surprising (IOM, 2001). The slow progress of clinical healthcare computerization has been attributed to a lack of adoption of, or resistance to, the IT support provided.

Research findings by Wiley-Patton (2002) and Malloy (2004) report that resistance to information technology is a major issue for clinicians expected to utilize new technology (Spielman, 2004).
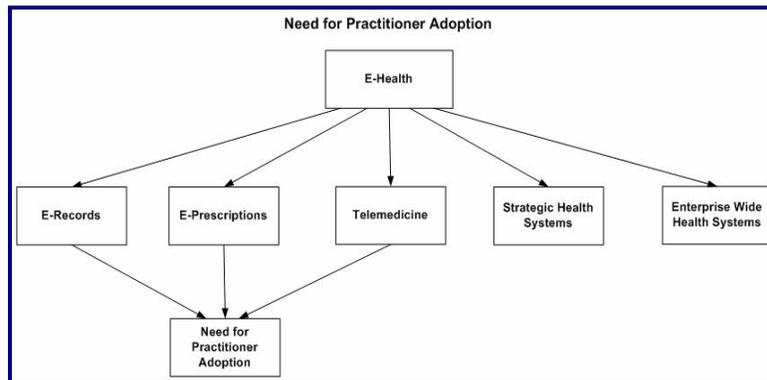

Figure 1- Need for Clinical Information Technology Adoption

The reasons for clinical IT resistance

The adoption of information technology by practitioners is being forced by the advances in E-Health Records, e-prescriptions, and telemedicine, yet resistance to adopt continues to exist. Hence the theoretical causes of that resistance are currently a major issue. For example, the technology acceptance model (TAM) proposes perceived usefulness and ease of use as the primary determinants of new technology acceptance (Davis, 1989). Given the potential usefulness of IT, based on the reasons outlined above, this leaves poor usability as the main reason for clinical IT resistance. However a study of TAM in a healthcare setting found ease of use was hardly predictive of acceptance at all (Chismar & Wiley-Patton, 2002). That doctors and nurses often use complex and difficult medical equipment may explain why "hard to use" so weakly affected non-acceptance for them. It seems unlikely that the difficulty of use of IT is a critical factor in IT non-adoption by clinical healthcare providers given their professional nature, and their ready use of other complex technologies.

Other common reasons for IT non-acceptance seem equally weak. For example cost could be a factor, but cost has not stopped other health

technology advances far more expensive than IT support. That medical providers inherently resist technology is also unlikely. Computers are not only well integrated into healthcare administration, but also into areas staffed by clinicians, like laboratory support, so an intrinsic resistance by medial staff to useful IT seems unlikely.

In considering other reasons for non-IT acceptance a recent Web of System Performance (WOSP) model suggests IT performance a combination of eight distinct factors: functionality, usability, reliability, flexibility, security, extendibility, connectivity and privacy. The WOSP model extends and integrates previous theories, including TAM, the general security model, and non-functional requirements research (Whitworth and Zaic, 2003). A study of attitude browser use found privacy and security were rated higher than functionality and usability (Mahinda & Whitworth, 2005).

Applying this model to the healthcare setting suggests:

1. The clients of healthcare are often in poor health, so clinical healthcare providers often have to move to the client's location, e.g. a patient's bedside. Consequently any IT support must be mobile, and in emergency cases where time is an issue, highly mobile (easy to move or relocate).

2. Healthcare data can be extraordinarily sensitive, as revealing patient information can affect careers, marriages, family relations and job tenure and prospects. People coming into a healthcare setting expect the utmost privacy regarding their personal health data, and without that, may not come at all, e.g. with sexually transmitted diseases.

3. National privacy standards have been mandated under the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Although there are numerous parts to this legislation our research is concerned with, Privacy, Security and Electronic Transaction and Code Sets Rules that mandate protection and privacy of certain individually identifiable health data, referred to as protected health information (PHI) (www.hipaa.org). Clinical healthcare providers have unique requirements for mobile IT tools which will grant them access to PHI that will be in the form of E-Records', E-Prescriptions, Telemedicine etc,. Therefore, in order for them to adopt or become compliant with HIPAA regulations IT innovations must adhere to the constructs that keep private data confidential and security, as well as, address their individual requirements.

However while IT has traditionally provided privacy and security of data, it generally does so by physically restricting processing to a safe location. For example bank financial date travels down secure lines and is processed at secure locations. Conversely, while IT can provide excellent mobility, as cell-phones illustrate, this is done by wireless data exchange, where information is passed through public space. Hence home networks for example are notoriously insecure, as anyone nearby can pick up the broadcast. A classic example was when a reporter intercepted a phone call from Princess Diana's cell phone, and it is well known today that terrorist cell phone calls can be intercepted.

While mobility and confidentiality are individually common in IT, their combination (which clinical healthcare requires of its IT support) is not. Combining independent performance criteria like confidentiality and mobility raises the problem of "cross-cutting requirements" (Moreira, Araujo, & Brita, 2002). These can be particularly difficult to deal with, as IT designers must create a "synthesis of the form" across more than one dimension (Alexander, 1964). That clinical IT invokes cross-cutting requirements beyond well known functionality and usability requirements may explain why clinical IT has so far largely resisted computerization.

A preliminary study

A preliminary study into the reasons for healthcare IT adoption was conducted at an urban teaching Hospital with a Medical school affiliation to investigate non-monetary factors that affect information technology adoption in clinical healthcare. Inhibitors were identified as factors that precluded clinicians from adopting technology that could help them. The findings suggested that while subjects recognized the functional value of system data integration and IT user-friendliness in information technology solutions, additional factors like faster system response were also major implementation concerns in the clinical setting. This pointed our research towards identifying IT factors other than those usually considered by IT designers.

Conclusion

Our research presents a framework for information technology adoption in a clinical setting. It suggests that information technology mobility and confidentiality are critical considerations for practitioner adoption. It also implies there is a critical "gap" between IT providers and IT users in the clinical setting, and Brown and Swartz (1989) note the importance of

matching service provider and receiver perspectives to avoid gaps arising from inconsistent perceptions (Gomez, Passerini, Hare, 2006). Hence we are currently investigating whether there is indeed a requirements gap between the perceptions of IT designers and providers, and their clinical users. If so, it would suggest a major realignment of IT services is necessary for their adoption in clinical use to occur.

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