UNDERSTANDING THE E-VIEWER SYSTEM IMPLEMENTATION

Emergent Research Forum (ERF)

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Abstract

Video conferencing is emerging as a useful clinical tool. Its application has extended to cover home monitoring, psychotherapy, managing patients with chronic diseases among other applications. However, utilizing video conferencing capabilities to facilitate discharge processes has, to date, been sparsely researched. This study proffers the use of video conferencing to facilitate better patient discharge processes at a large Australian not-for-profit tertiary healthcare group. A FVM framework is developed to assess critical success factors.

Keywords

E-Viewer System, Telehealth, Remote Patient Monitoring, Fit-Viability Model

Introduction

For patients undergoing surgery in a multi-day admission, a standard care scenario requires that their surgeon will review the patient post-operatively to check on their progress. This is usually done by the specialist attending in person before the patient may be discharged. However, in the Australian setting, most specialists (known as VMOs or visiting medical officers) work at multiple institutions which are often geographically dispersed. As a result, reviewing ward rounds can be delayed for numerous reasons such as travel or being with another patient which in turn may lead to lower patient satisfaction as well as workflow and patient flow challenges. Telemedicine, whereby doctors consult via the Internet offers a potential solution. Hence, this research investigates the potential for the Point-of-Care system to be used to support a video conferencing discharge process.

Background

Due to rapid developments in health informatics (André et al., 2008; Basch, 2005; DesRoches, Painte, & Jha, 2013; Liu, Shih, & Hayes, 2011; Trudel, 2010), Telemedicine is becoming an important part of healthcare services and delivery in public and private hospitals (Zanaboni & Wootton, 2012). Healthcare organizations are expanding their boundaries by using integrated and collaborative IT solutions. Telemedicine uses and adoption in hospitals is considered as a major development not only at the technological level, but also at sociotechnical and cultural levels (Bashshur et al., 2001). According to Bangert et al. (1999), implementation and adoption of telehealth in hospitals represents a “paradigm shift” and is likely to impact all levels of healthcare organizations. This requires major changes not only with respect to technological perspectives but also from an organizational/cultural perspective.
A key challenge faced by healthcare organizations is around the need to adopt these technologies according to their requirements and best fit (Zanaboni & Wootton, 2012). This often places pressures on the fit and viability of the specific technology solution (Sheng et al., 1999). The successful adoption and implementation of telehealth has been the subject of extensive research (Gagnon, Duplantie, Fortin, & Landry, 2007; Obstfelder, Engeseth, & Wynn, 2007; Zanaboni & Wootton, 2012). However, understanding the viability of telemedicine implementation and adoption and the fit of technology within the organisational process in hospital environments is less prevalent in literature Zanaboni & Wootton, 2012. Further, the effect of sociotechnical issues such as macro level or external factors such as political, social, economic, environmental infrastructure and technology, laws and regulations; meso level or organizational factors such as leadership, management style, policies, structure; and micro level or tactical factors such as information sharing, training and learning, technical staff or user behavior have been even less widely studied (Wickramasinghe and Schaffer, 2010). Yet, it is precisely these issues that separately or in combination derail numerous telemedicine implementations. To examine this dilemma, we proffer a unique application of the fit viability model (FVM) to facilitate a better understanding of key issues pertaining the implementation and adoption of Point of Care (e-Viewer) System.

The aims of this study include to determine: 1) Proof of concept of the e-Viewer system as an adjunct for postoperative inpatient review. 2) if using e-Viewer as an adjunct for postoperative inpatient review will provide improved patient, staff and surgeon satisfaction and 3) if using e-Viewer as an adjunct for postoperative inpatient review will result in more efficient/effective discharge including 70% of patients discharged by 10 AM. In so doing, we answer the research question: “How can a FVM assessment assist in unpacking critical sociotechnical issues in the adoption and implementation of the e-Viewer system?”

Literature Review

Many healthcare information systems have been implemented around the globe with mixed results, despite the claims that eHealth can play a significant role in efficiency and effectiveness of healthcare service delivery (Avgerou, 2008; Liu et al., 2011; Trudel, 2010). The literature provides evidence of failed clinical systems and lack of adoption by users as well as outlining major challenges and barriers to implementation and adoption (Basch, 2005; DesRoches et al., 2013; Protti et al., 2009). Researchers have divided these barriers into different categories ranging from environmental, financial, social, technical and organizational (André et al., 2008). It is important to consider these factors in a systematic fashion when examining the implementation and adoption of any new system into a healthcare context.

The Point of Care System

The Point-of-Care system is designed and developed by OneView. This system is a bedside computerized information system whose terminals provide patients with a range of entertainment, education and information services, and clinicians with a range of integrated clinical applications including electronic prescribing and administration, patient results, and electronic nurse rounding. In addition, the system also supports non-clinical functions to cover the food and environmental needs for patients. Given that the Point-of-Care system is already implemented in the private not-for-profit healthcare environment, it makes sense to develop a telemedicine system (e-Viewer) that leverages this existing technology solution. Critical to designing the e-Viewer is an assessment of its fit and viability.

Fit-Viability Model

Tjan (2001) proposed fit viability dimensions for evaluating Internet initiative projects. Liang and Wei (2004) by taking these two dimensions and adding Task Technology Fit (TTF) theory proposed a fit-viability model to study m-commerce applications. In their framework, viability measures the readiness of the organization for the technology adoption and implementation, and fit measures capabilities of the systems to optimally perform the required tasks. These two dimensions make a simple matrix with fit on horizontal and viability on vertical axis, as shown in figure 1.
By using the four corners of the matrix, organizations can make an informed decision for technology adoption and implementation. Only those systems with high task-technology fit and high viability are good targets.

**Task-Technology Fit**

The theoretical basis of the fit construct is derived from the Task-Technology Fit model; thus fit between task characteristics and system features need to be high for the better performance and success and this will impact the decision-making process of an organization (Goodhue, 1995; 1998). Research (Soh et al. 2011; Goodhue 1998) has indicated that if a system is more aligned with the requirements of the users there are greater chances of system success which leads to better performance. This means that if the features offered by the system fit with the task requirements the users will be more inclined to use it.

**Viability**

Viability refers to the degree of impact of environment and organizational factors on a system adoption and implementation decision. These factors at the macro level include political and social, economic, environmental as well as infrastructure/technology factors. At the organizational level literature has proposed many factors at the strategic and tactical levels (Umble et al., 2003; Ang et al., 2002; Poon et al. 2004). Taking the e-Viewer system, economic (such as ability to provide the ongoing financial support need for the solution) and technological factors (such as the ability to ensure that correct technical aspects are always assured at both the patient and clinician locations) are critical success factors in the implementation and ignoring these factors can lead to an unsuccessful implementation and adoption. Management support, physical and IT further impact the viability of the system.

**Research Framework**

The research framework shown in figure 2 illustrates the key constructs and factors potentially affecting the e-Viewer system implementations. Fit is measured by matching the requirements of the organization with the functionalities offered by the e-Viewer system e.g. data format, operating procedures, and output format. In contrast, viability is measured by assessing the impact of national and organizational factors on the adoption decision of the organization and individual user adoption.

**Methodology**

The primary objective of this study is to address superior patient-centered care at discharge in busy hospital environment. Specifically, the study investigates the potential of using the e-Viewer system as an adjunct to patient discharge. Based on the criteria noted by Yin (2010); the appropriate choice of methodology to assess the fit and viability of the e-Viewer system as identified in the research framework (figure 2) is a qualitative case study research. Qualitative research is holistic, humanistic, and interactive and can thus provide more support to focus on the study of a complex phenomenon of human and system interaction and relationship; as in our case of the e-Viewer system implementation (Motwani et al. 2008; Yin 2008). The chosen case study is an Australian private not-for-profit tertiary hospital. All ethical clearances have been secured.
Data is collected by employing a variety of data collection techniques including: in-depth, open-ended unstructured interviews with key informants from the different key stakeholders, surveys administered to patients, site observation and analysis of key documents. This study involves two major groups of participants: Patients and Clinicians. Specifically, 1. Patients: A pilot study with 200 patients is being conducted to demonstrate proof of concept of the e-Viewer system over approximately 6 months using a two arm non-blinded study design. 100 patients are assigned into the control arm, which utilizes standard care protocols for discharge while the other 100 patients assigned into the intervention arm which utilizes the electronic discharge solution using the e-Viewer system. 2. Clinicians: these include VMOs (urologists) and nurses (on the chosen wards) make up the clinicians involved in this study. The clinicians all conduct their normal duties regarding discharge to both arms of the study. The only difference being that the intervention arm utilizes discharge with the e-Viewer system. The chosen clinical context is urology patients. Initial contact with patients is made by their relevant VMO. Standard techniques of qualitative analysis such as coding and thematic analysis are employed for data analysis and presentation of results. (Kvale, 1996).

Discussion and Conclusion

The purpose of this research in progress paper is to conceptualize a framework to assess the fit and use viability of the developed e-Viewer system. At present we have already commenced with the clinical trial. Directional data to date highlights that patients do value the e-Viewer system to enable them to have a convenient discharge process with no waiting time. Some of the nurses have found the solution from a technical perspective a little challenging as they must assist the patient in the setup of the system and the technology has not always been working to its desired specification e.g.; sound and video have at times been less than optimal. Notwithstanding the same technical issues, the VMOs have also found the e-Viewer system to be beneficial. Thus, it would appear that consistency of technical quality of video and sound are key issues in assessing the viability while in terms of fit; based on the directional data to date, there is a strong positive result. Clearly, until the study is completed we will not have sufficient data to confidently assess the fit and viability of the solution. However, the directional data is positive and highly suggestive of the benefits of the e-Viewer system. Moreover, the study has several implications for theory and practice as follows: 1) for theory – the presented research framework serves as an assessment tool for many/any IS/IT solutions for healthcare that can support decision making by healthcare executives and clinicians in a systematic and robust fashion in terms of whether or not to embrace a certain technology solution while 2)
Understanding The E-Viewer System Implementation

for practice – the directional data highlights potential benefits and positive impacts to patient experience and clinician satisfaction. At the conclusion of the study it will only then be possible to assess impact on/impact to discharge rates and times as well as other subtler financial points.

REFERENCES


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