

Review

eHealth willingness assessment framework with special reference to electronic health records (EHR) in developing Countries

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Electronic health records (EHR) outlines the focal point of any eHealth system because patient record system (PRS) is the primary transaction processing system (TPS) where from the story of EHR begins. However, the evaluation of users' willingness is unavoidable for successful implementation of health informatics. This paper presents eHealth willingness assessment framework with special reference to EHR. The willingness assessment for eHealth systems becomes more crucial in connection with developing countries like Pakistan because the demographic impacts are more severe in developing countries than advanced nations. This study is intended to identify the willingness of users via the main dimensions of readiness for eHealth systems for the success of health informatics.

Key words: eHealth, electronic health records (EHR), TPS, PRS, ICTs, IS, willingness assessment.

INTRODUCTION

Several dimensions of willingness to adopt electronic health records (HER) are considered important for successful implementation of EHR and the eHealth applications. However, the research indicates that users' basic, engagement, technological and societal willingness play a central role and it becomes extremely important in the context of the developing states like Pakistan. The purpose of this paper is to discuss and review some previous researches on the effect of above mentioned willingness assessment elements for the success of EHR which ultimately determines the success of IS/ICTs in the health sector.

Irrespective of the types of research and data, scholars have identified different aspects as important concepts for the success of eHealth applications. Yet, the research indicates that EHR and its assessment of willingness to adopt, is crucial for the success of EHR and the eHealth in developing nations generally and Pakistan in particular. It is noteworthy that most of the studies about EHR and its successful implementation have been undertaken in both advanced (Little et al., 2007; Eysenbach et al., 2007; Reichertz, 2006) and developing countries (Asangansi et al., 2008; Oak, 2007; Kimaro and Nhampossa, 2007; Omona and Ikoja-Odongo, 2006).

E-HEALTH

eHealth is the application of information and communication technologies (ICTs) for the performance of all the functions that affect health (Silber, 2003). Healthcare issues can be dealt with in better ways by using eHealth systems. Similarly, Nykanen (2006) advocates that eHealth is the use of Information and Communication Technology (ICT) to make possible a better health and healthcare. eHealth has been disregarded in developing nations because of less awareness about its applications among healthcare managers, while during the development of national healthcare systems, eHealth in majority of developing states including Pakistan has been neglected. Healthcare leaders in developing states do not possess awareness about the benefits of eHealth. Furthermore, Pakistani hospitals lack the culture of facts and figures based decision-making and qualified and trained human resource to plan and develop eHealth systems

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(Pakistan's Seventh International Convention on Quality Improvement (ICQI), 2002).

USERS' WILLINGNESS FOR EHR

EHR generates complete data about patients. According to IOM (2003) and Grimson (2001), EHR is the collection of electronic patient records about patients' health, past medical history, progress reports, diseases, medication and laboratory test results. These data have the ability to generate a complete record/information of a patient. Electronic health record is vital to manage health related problems through complete and accurate information about the patients. EHR is crucial for better healthcare management as it provides integrity and accuracy of data in healthcare organizations which is pivotal to both medical and legal areas (AHIMA, 2007).

Assignments and tasks of healthcare professionals are restructured when IS/ICTs are introduced in healthcare organizations and it may be disturbing for healthcare professionals to perform according to the new work designs. While EHR are implemented in healthcare organizations, modifications and changes occur not just because of introducing eHealth systems, but also because of restructuring the assignments and duties of healthcare workers according to new technological requirements. Furthermore, healthcare professionals do not possess the willingness to perform their re-engineered job due to the introduction of eHealth systems (Eric et al., 2006). Introduction of IS/ICTs at work place of healthcare organizations changes the nature of performing the tasks which is usually opposed by the healthcare employees. Therefore, their readiness to adopt IT-applications must be assessed before their introduction in the hospitals. The adoption of IT in health organizations brings a disturbing change at the work places, therefore, Demiris et al. (2004) assert that eHealth willingness assessment is indispensable for successful implementation of eHealth systems.

Developing nations are unable to develop sustainable eHealth applications because of complications and difficulties in the structure and adoption of IS/ICTs. Developing states confront the problems of up-holding the IS/ICTs due to their complicated structures (Braa et al., 2004). Assessment about the willingness of healthcare professionals for eHealth plays a vital role for the success of IT-projects in health sector. Assessment of willingness carried out before the implementation of IS/ICTs projects is crucial due to the complications of eHealth applications (BC eHealth Steering Committee, 2005). Before the implementation of IT-applications in organizations, assessment of IS-projects enables an organization to plan and implement eHealth applications effectively. Properly planned and managed IS-projects generate users' (doctors) acceptance for the change in organizations due to adoption of eHealth tools and devices (Callioni, 2006).

Analysis of users' willingness for eHealth applications helps the authorities to find out in advance about the required eHealth gadgets and organizational resources to acquire the same. Pre-implementation users' willingness analysis for adoption and use of IT-applications in healthcare organizations helps decision makers to handle implementation tasks effectively. Furthermore pre-implementation analysis covers the assessment of the ICTs/IS that whether planned eHealth applications will solve current problems and meet the demands and requirements of the organization or not and the analysis of the organizational resources that are required for the selected eHealth systems (Brender, 2006).

Willingness of healthcare professionals to use IT-applications is essential for successful eHealth implementations. According to Khoja et al. (2007), willingness for eHealth means preparedness of healthcare institutions to adopt IS/ICTs for performance of health related functions, while Saleem (2010) argues that willingness for eHealth systems by healthcare organizations is the ability of these organizations to encourage and sustain the growth of eHealth devices and gadgets, infrastructural setup, and users' skills.

DIMENSIONS OF ASSESSMENT

According to Khoja et al. (2007), eHealth willingness could be analyzed from four different aspects, that is, the basic analysis, engagement analysis, technological and societal analysis. Fundamental readiness analysis identifies the basic needs and behavior of healthcare workers towards basic elements of eHealth systems. Basic willingness or readiness for EHR means assessing the basic needs of healthcare professionals, their attitude toward the use of information systems and their confidence in ICTs/IS. Furthermore, basic willingness analysis is concerned with assessing the impact of use of IS/ICTs upon work processes (Allan and Englebright, 2000). Basic readiness analysis uncovers the problem and issues of paper-based information systems. On the other hand, the core willingness assessment is concerned with finding out about the major issues in connection with paper based patient records generation, storage and retrieval. Healthcare professionals are much concerned about patients' privacy and their satisfaction regarding completeness and accuracy of paper based patient health records (Staroselsky et al., 2006). Physicians and doctors' un-willingness for paper-based health record system makes the authorities to plan and implement IT-applications in healthcare organizations. Jennett et al. (2005) report that when healthcare employees record their complete dissatisfaction with the paper-based record system, then hospital authorities and doctors must adopt the new practices (EHR) to create change.

Success of EHR depends upon the involvement and interest of healthcare professionals in eHealth

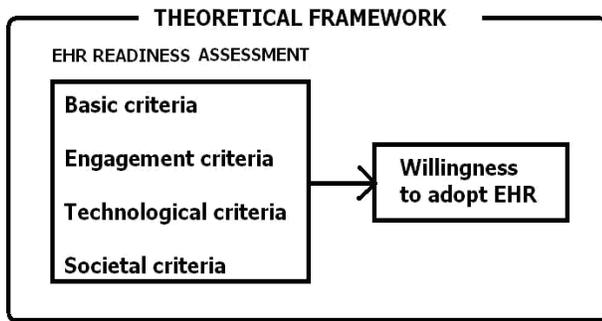


Figure 1. EHR variables and their inter-relationships.

applications. Here comes the role of engagement analysis, that is, the involvement of users/healthcare professionals' self-assessment of knowledge about IS/ICTs and their engagement in the process of implementing EHR systems (Campbell et al., 2001). Healthcare providers are willing to adopt new systems upon recognizing the gains from eHealth. Physicians and doctors' interest about EHR indicates their consciousness about the advantages they can take by making use of IT-applications (Jennett et al., 2003, 2005).

Likewise, the technological assessment is crucial for the successful implementation of EHR. Technological readiness analyzes the present available hardware, software, network support and the IT-professionals for EHR in hospitals (Khoja et al., 2007). The adoption and use of EHR in healthcare organizations depends on the infrastructural arrangements. Technological willingness of healthcare organizations for EHR is very high if availability of hardware and EHR-related software and training of health care providers are assured (Halamka et al., 2006). Doctors can effectively use and take the maximum benefits of the EHR system if given proper and regular training as according to Chetley et al. (2006), the effective use of eHealth applications depend on proper training of the users.

On the other hand, the societal willingness analysis implies to assess the impact of EHR upon the patient and the society. Societal readiness evaluation aims at assessing the impact of use of computers and EHR applications on patients' satisfaction. Furthermore, Khoja et al. (2007) opine that along with internal communication among healthcare providers, communication with other sections and departments of the same hospital, for example, pathology and radiology departments and other hospitals, to share the patients' information is significant for the successful implementation of EHR.

DISCUSSION

Healthcare leaders in developing countries do not possess consciousness about the benefits of eHealth.

Likewise, most of the hospitals in developing countries

like Pakistan lack the environment of rational decision-making based on complete and accurate information (Pakistan's Seventh International Convention on Quality Improvement (ICQI), 2002). Thus the implementation of eHealth applications confronts resistance by the healthcare professionals as new systems change the structure and pattern of tasks and duties (Demiris et al., 2004). Developing countries can not maintain IS/ICTs in health organizations because of the difficulties in their structures and lack of infrastructural arrangements for their proper adoption (Braa et al., 2004). Therefore, analysis of willingness before the implementation of IS/ICTs projects is crucial due to the complicated structures of health informatics (BC eHealth Steering Committee, 2005). Pre-implementation willingness analysis of eHealth applications in healthcare organizations assists the decision makers to manage and control implementation tasks effectively. Furthermore, the analysis covers the assessment of the ICTs/IS that whether new systems will solve current problems and meet the requirements of the organization and analysis of the organizational resources that are required for the selected eHealth systems (Brender, 2006).

Willingness analysis pinpoints the basic needs and behavior of healthcare workers towards the elements of eHealth systems (Allan and Englebright, 2000). Willingness assessment is concerned with the identification of the major issues regarding paper based patient records generation, storage and retrieval. Doctors and physicians are very much concerned with patients' privacy and their satisfaction regarding completeness and accuracy of paper based patient health records (Staroselsky et al., 2006). Hospital authorities introduce EHR when doctors show their complete dissatisfaction with paper-based record system (Jennett et al., 2005). Physicians and doctors' interest about EHR indicates their consciousness about the advantages they can reap through the application of IT (Jennett et al., 2003, 2005). Availability of the required hardware, software, orgware, peopleware and network support are significant for the success of EHR in hospitals (Khoja et al., 2007). The basic theme of this paper is presented graphically in Figure 1 which shows all the variables and their inter-relationships thus expressing the contents of the current article.

CONCLUSION

eHealth is a technology based new way to solve many longstanding health-related problems by making use of digital technologies. eHealth systems 'health-informatics' is equally usable by both the developed and developing countries because technologies are now universally available. However, the implementation of eHealth systems in most of the developing countries face users' (doctors) resistance due to advanced mode of IT-applications for health organizations. Complicated and

sophisticated nature structuring of eHealth systems and modifications in work pattern of healthcare professionals require basic needs, engagement, technological and societal readiness for success of IS-projects in healthcare sector. Readiness assessment of proposed users of eHealth tools enables the authorities to plan and manage the eHealth implementations effectively. Furthermore willingness assessment not only identifies the basic needs of healthcare professionals about eHealth systems, but also spells out the required hardware, software, orgware and peopleware for the success of EHR system in hospitals.

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