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A Framework to Investigate the Role of Mobile Technology in the Healthcare Organizations

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ABSTRACT

Background

In 2004 George W. Bush proposed incentives for the use of health information technology (HIT) in the US. This executive order's intent is to use the office of the National health Information Technology Coordinator to encourage the adoption of electronic health records (EHR). Medical practitioners need to have the right information, at the right time, and in the right location. Mobile information technology has significant advantages over hard wired systems in attaining the three rights indicated earlier.

Objective

The technology acceptance model (TAM), and the modified technology acceptance model (MTAM) will be evaluated to measure the acceptance of mobile technology in a healthcare scenario. Based on the results of the study, a user behavioral model in regard to mobile technology adoption in healthcare will be proposed.

Method

Researchers will use standard data collection techniques such as cross-sectional surveys, questionnaires, and structured interviews. Already tested interview and survey questionnaires which will concentrate mainly on the user perception w.r.t technology acceptance issues will be used to conduct the surveys and interviews.

Results from the current study

A study has been conducted on the process and evolution of mobile technology adoption in healthcare. Research methodology to be used in the future study has been determined. Testing of TAM and MTAM has to be done in a healthcare scenario. Based on the study, a behaviour model will be proposed.

Keywords

Information technology adoption in healthcare, mobile technology adoption in healthcare, testing technology acceptance model in healthcare, and testing modified technology acceptance model in healthcare.

RESEARCH QUESTION

ID	Research Question	Aim
RQ1	To test the available TAM models in the healthcare scenario	TAM and MTAM will be tested in a healthcare scenario
RQ2	To find what factors can affect user behavior with respect to mobile technology adoption in healthcare and thereby develop a framework.	To develop a framework by identifying what standard factors will appear and how those factors can be used to assess the user behavior towards the process of mobile technology adoption in health care organizations.

Table 1: Research questions

EVOLUTION OF TECHNOLOGY ADOPTION IN THE HEALTHCARE:

Until the last decade of the 20th century, many of the healthcare professional have misconceptions and reluctance towards information technology (IT) adoption in healthcare (Cypher, Chevrollier, Montavont, and Golmei, 2006; Garg, Adhikari, McDonald, et al. 2005; Linda, 2000). Even in the starting years of 21st century, many organizations which are involved man-to-man transactions, remained conservative towards IT adoption (Coiera, 2000). Research analysis on (Marsh & Bulanti, 2003), and on database (which was lastly updated in 2006) of Dorenfest & Associates (A Chicago healthcare IT research firm), reveals that there is a considerable growth in the adoption rate of IT by the HOs. Conversion of paper-based systems to electronic health records can be considered as a remarkable example in the process of adoption of IT into health care. As the period in the mandate issued by George W. Bush in the year 2004, w.r.t the EHRs adoption (Bush GW, 2004) is not so far, i.e. 2014, and as mobile technology has significant advantages (w.r.t costs, handy, ease of physician usage, and available functionalities) over the wired products (Siau & Shen, 2002), there is need to recognize the scope of mobile technology to be considered as the near future in the process of improving the quality of health care.

RESEARCH METHODOLOGY TO BE USED:

Research in the area of testing the available technology acceptance model (Davis et al, 1989) and modified technology acceptance model (Venkatesh et al, 2003) to evaluate the intention to use mobile technology by healthcare professionals in a healthcare scenario remained minimal (Wu, Shen, Lin, Greenes, Bates, 2008, Chismar, and Wiley-Patton, 2003). In the process of continuing this research-in-progress, the researchers will use standard data collection techniques such as cross-sectional surveys, questionnaires, and structured interviews (Kaplan & Duchon, 1988). Already tested interview and survey questionnaires which will concentrate mainly on the user perception w.r.t technology acceptance issues will be used to conduct the surveys and interviews. Statistical method to analyze the survey results will be determined only after the survey results are obtained.

NEED TO RECOGNIZE ADOPTION OF MOBILE TECHNOLOGY BY HEALTHCARE ORGANIZATION AS NEAR FUTURE GOAL:

In the process of getting technology more into healthcare, usage of computer on wheels by the healthcare organizations remains as a good regional example. Adopting mobile technology can be derived as the process of taking technology adoption on to the next level. Mobile technology will help in solving multiple health problems located world wide. Rapid growth in mobile users (CTIA, 2008) every year will stand as a proof that mobile technology has a lot to offer to the healthcare industry. Any new applications (related to the healthcare) installed into those mobile devices can be fruitful to the healthcare organizations. Proper training provided by the hospital staff to the patients before their discharge on how to use their mobile devices(which are equipped with the hospital's software) shown in Table 2, will help in significantly improving the delivery of quality care.

| Available Mobile Devices	Technologies used	Use in Healthcare
PDAs	Apps, Wi-Fi, WAP	(Baumgart, 2005; Lapinsky, et.al.*, 2000; Lapinsky, et.al*, 2001; Fischer, et.al.*, 2003)
Laptop/PCs/Tablets	Wi-Fi, Bluetooth, 802.11n	(Ping, et.al.*, 2009, Weitzel, et.al.*, 2010, Weitzel, et.al.*, 2009)
Mobile Phones	Apps, Wi-Fi, WAP, NFC, Display Technologies, SMS/MMS, Bluetooth, GPS	(Ivanov, et.al.*, 2010; Marcus, et.al.*, 2009; Wang, et.al.*, 2009)
Pico Projectors	Display Technologies	(Vijayaraghavan, et.al.*, 2009; Inami, et.al.*, 2000)
Bodily Wearable Sensors	GPS, Wi-Fi, WAP	(Espinoza, et.al.*, 2009; Trossen, et.al.*, 2007)

Table 2: Mobile technologies and their use in healthcare

*Full references have been omitted for the sake of brevity

Results of Gururajan and Murugesan's and others (Dee, Teolis, and Todd, 2005; Gururajan and Murugesan, 2005) research indicate that of all the mobile devices available, role of PDAs has been predominant in the healthcare industry. The role of smart and small mobile devices is increasing, but still, they have some limitations w.r.t connectivity, data transmission and screen resolution issues (Gururajan and Murugesan, 2005).

Based on the user behaviour towards the technology available and towards the anticipated (mobile) technology, and considering the survey results, the researchers will develop a user behaviour model. The user behaviour model shown in the below figure 1 is the model which is in the process of development.

PROPOSED USER BEHAVIOR MODEL (IN THE PROCESS OF DEVELOPMENT):
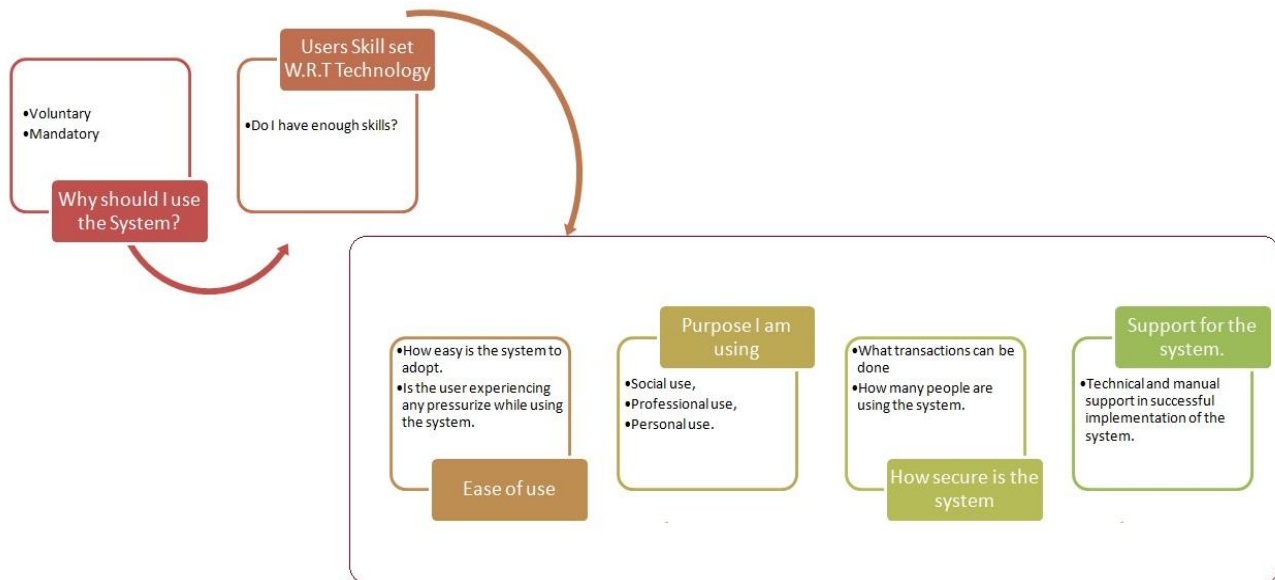
Figure 1: Expected User Behavior Model towards the mobile system

The researchers plan to investigate the user adoption and satisfaction with present technology, and with any mobile technology they (participants) are using, different contexts they are using these technologies, their availability, easeness to use, effects of their usage, and usefulness.

Authors welcome suggestions, comments, and questions.

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