Understanding Physicians' Adoption of EMR: An Extended Technology Acceptance Model the Case of: Jordan

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1 author:

Ahmad Samed Al-Adwan
Al-Ahliyya Amman University

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Ahmad Al-Adwan
Cardiff Metropolitan University, ahmad_samed85@yahoo.com

Hilary Berger
Cardiff Metropolitan University, Hberger@cardiffmet.ac.uk

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Understanding Physicians' Adoption of EMR: An Extended Technology Acceptance Model the Case of Jordan

Ahmad Al-Adwan
Cardiff Metropolitan University, Cardiff, UK
Ahal-adwan@cardiffmet.co.uk

Hilary Berger
Cardiff Metropolitan University, Cardiff, UK
Hberger@cardiffmet.ac.uk

Abstract

The response of health professionals to the use of health information technology (HIT) is an important research topic that can partly explain the success or failure of any HIT application. The present study applies a modified version of the revised technology acceptance model (TAM) to assess the relevant believes and acceptance of electronic health records (EHR) in Jordan. This paper outlines a research project that will examine EHR acceptance and utilisation by physicians in Jordan. It describes the theoretical basis behind the development of a research model that will be employed to empirically validate the model using substantial quantitative and qualitative data. The theoretical significance of this work is that it uses a thoroughly constructed research model to extend technology acceptance research into the health sector.

Keywords: Technology Acceptance Model, Healthcare, Electronic Health Records, Jordan.

1.0 Introduction

Nowadays, the healthcare industry is a hot spot of research due to the growing importance of healthcare to people and governments and the rapid increase of its costs (Fichman *et al.*, 2011). The amount of medical information is continuously developing, health organisations face additional demands in order to improve their services, especially in light of the emergence of advanced technologies (Hung *et al*. 2009). Healthcare professionals are facing many challenges every day, however knowing what the right thing is, what the right way is, and when the right time is, continue to be the biggest challenges (Eisenberg, 1997). The recent developments of advanced technologies and the appearance of new waves of medical treatment and practices has resulted in increasing the public expectations of healthcare services (Telegenisys, 2008).

The diversification and expansion of healthcare services has generated a significant amount of information utilising different formats which require a high level of management (Igira *et al.*, 2007). The Healthcare sector has many users with different needs in terms of how information is used, represented, and stored (Grimson *et al.*, 2000). Accordingly, paper-based records are insufficient to cope with the complexity of the healthcare environments and its continuous growth. As a consequence obtaining a sustained and reliable improvement in healthcare with such methods is extremely difficult (Wager *et al*., 2009). Therefore, the use of EHR is dynamically growing (Luo, 2006). The urgent need to achieve data integrity and cut costs forces many healthcare organisations across the world to shift toward the adoption of HITs and EHR in particular (Sullivan, 2010).

Understanding user's acceptance or rejection of information technology is considered one of the most challenging issues in information system research (Venkatesh *et al.*, 2003). Successful implementation of an information system depends heavily on the amount of attention paid to human issues, which have a dramatic impact on the process (Burke *et al.*, 2001). One of the biggest human issues is resistance to change. Klaus and Blanton (2010, p.3) in their research recognised that the main obstacle towards implementing successful IT projects within organisations is employee's resistance to change, which is defined as "*the behavioural expression of a user's opposition to an information system during the implementation"*. Many organisations suffer from individual users who do not recognise the important benefits offered by new technologies. Adams *et al.* (2004) insist that user's resistance is a substantial issue that

should be addressed in the earlier stages; individuals responsible for information systems' implementation should be aware that user's resistance results in system failure.

The aim of this research is to investigate the adoption and acceptance of electronic health records (EHR) in the Hashemite kingdom of Jordan and formulate a model which reflects the factors that significantly influence physician's acceptance. Therefore, the primary objectives of this research are:

- Identify the key factors that could impact on EHR systems implementation and adoption in Jordan.
- Determine the major elements that influence physicians in the acceptance of EHR systems.
- Develop a model of EHR's acceptance for physicians in developing countries, such as Jordan.
- Test the model and put forward recommendations that motivate and encourage the adoption and acceptance of EHR systems in Jordan.

2.0 Research Model

Despite that various theoretical models have been devised to investigate technology acceptance in the IS literature, the research model which will be developed and tested in this study is based on the technology acceptance model and the generic framework presented by Chau and Hu (2002).

TAM has achieved a considerable success in predicting and relatively explaining end users acceptance of HIT, however, there could be more potential improvements (Holden and Karsh, 2010). These improvements should be centred on identifying salient believes that refer particularly to health professionals in regards to using EHR systems; such improvements could generate a set of interesting theoretical relationships which in turn produce more robust and contextualising usage of TAM to EHR usage.

Chau and Hu (2002) point out that user's acceptance behaviours are driven by three dimensions of factors related to individuals' technological and organizational (implementation) contexts. Chau and Hu's (2002) dimensions were applied to the acceptance of telemedicine among physicians. Individual context refers to the characteristics of users, whereas the technological

context refers to the characteristics and features related to technology itself. Organizational context refers to the professional environment (work place) where technology is employed. Studying these contexts and their implications on user acceptance behaviours will provide a strong background that gives extensive explanations about the potential factors and effects that drive users to accept or reject technology within a particular environment, and consequently top management can take proper actions (Han, 2003). Chau and Hu's (2002) framework will be employed in this study due to its potential applicability within health sector and for its diverse contexts which provide a systematic examination of EHR acceptance that can be targeted in order to offer recommendations to multiple stakeholder groups.

3.0 Research Methodology

The philosophy of this research study presents the principles of the phenomenological (Blumberg et al., 2005) perspective and adopts both qualitative and quantitative methods of data collection through a case study. The aim is to capture extensive and rich descriptions of events, actions and the interaction between stockholders and the events as the occurred (Cooper and Schindler, 2006). The objective is to obtain several perspectives of a single organization over a period of time. Investigating a phenomenon in more than one context is generating more robust results than basing results on just one case. However, a single case study is more sufficient when it affords access to information that is hardly accessible to researchers, thus it will offer as yet unknown insights. Blumberg *et al.* (2005, p.131) state "*a single well-designed case study can provide a major challenge to a theory*". Furthermore, *"a single organisation does not necessarily prevent generalizability as this can take the form of concepts, theories, specific implications or rich insights"* (Walsham 2006, p. 322). Therefore, the current study will adopt a single case study with embedded unites of analysis design to investgate the adoption and acceptance of EHR systems in Jordan.

For this research an *exploratory study* is proposed as effective means of investigating *'what is happening; to seek new insight; to ask questions and to assess phenomena in a new light'* (Robson 2002, p.59). It will be exploratory in terms of finding out the key factors that could impact on EHR systems implementation and adoption in Jordan. Therefore, the exploratory research strategy will be appropriate to achieve the aim of the research, because it affords a

valuable means of finding out the current status of the phenomena of EHR systems acceptance and the potential barriers toward their adoption.

The first stage was a search of the secondary literature. The secondary data sources were centralised on further reading of books, academic papers, conferences papers and journals. As the research models in its final stage, the second stage is the primary research which will last for 6 months within the project environment. The data collection techniques will involve face to face semi-structured interviews and survey questionnaire. QSR NUD*IST Vivo (NVivo), a qualitative data analysis software tool will be utilized to store and manage the empirical data gathered from the interviews, whereas the questionnaire data will be analysed via SPSS software.

Questionnaires are an appropriate method to explore the challenges and barriers facing physicians in adopting EHR systems, since there are many questions that should be asked in order to achieve these objectives. Questionnaires are suitable instruments for collect data from a large sample population with high response rate such as physicians. Finally, questionnaires can be easily analyzed; there is a large number of software that could be used for statically analysing questionnaires and obtaining valuable and reliable results. Semi-structured interviews will be employed to compliment the questionnaire method. Semi-structured interviews are conducted with head of departments and managers. Semi-structured interviews are appropriate in that they give the researcher the opportunity to expand and extend the topic areas with interviewees as appropriate. Additionally, semi-structured interviews enable researcher to order his questions in a way that suites his/her research aims and objectives.

4.0 Sampling and Data quality issues

The research will include physicians from three main public hospitals in Jordan. The number of physicians involved in this research will be expected to reach 500. The selection of the three hospitals is based on ease of information accessibility. There are many issues linked to data quality in relation to the use of interviews and questionnaire as methods of collecting data, these include: reliability, validity and bias (Saunders *et al*., 2009).

Bell (2005) points out that there are many factors, which lead to bias and it is easy to fall into bias especially with research that is carried out by a single researcher. Bias can take many forms

during the research, deliberately or unwittingly. A researcher in his/her literature review, for instance, might only select items, which support his/her point of view and ignore the rest or use inappropriate language to steer strength of feeling in one direction. Additionally, a researcher might choose primary data sources that support his/her opinion. For instance, a researcher could select people who share the same point of views in the process of collecting data. Accordingly, the current research selects the samples randomly to reduce bias as much as possible. However, as discussed previously, the current research will follow many procedures to raise the validity and reliability of both the questionnaire and the interviews:

- Respondents will be informed about the aim of the research in order to help them to answer the questions on that basis. Furthermore, the researcher is very keen to inform all respondent about what will happen to the collected data and the purpose for which it will be used. The researcher must assure all respondents that privacy and confidentiality are important and anonymity will be safeguarded at all times. All data will be strictly kept confidential and used only for this research study.

- The researcher will formally ask managers and head of departments for a permission to conduct both questionnaires and interviews in their organisations. This will be presented by a formal letter introduces the researcher information, the aim and objectives of the research, and what will happen and how the data will be used in the research.

- It is a priority to form the questions in simple and clear wording style that helps the respondents to understand the questions easily. Additionally, it is essential that the time required to complete the questionnaire is not long; the estimated time to complete the questionnaire is **15** minutes. In term of interviews, it is important to ensure that there is a plan to steer the interview in effective and fast way; the estimated time for each interview is **20** minutes.

- A Pilot study will be used to assess the questions; after forming the questions the researcher consults academic staff before obtaining the approval from the supervisor.

- Previous arrangements will take place before conducting any interview to make sure that the interview will not affect the interviewees' mode and interrupt their work; the interviews should appropriately suite their time space. Additionally, the researcher will ask the interviewees if they are interested to participate in an interview by directly calling them.

We conclude by outlining the following stages of this research study. Our next step is to gather and analyse the primary data. Once completed a model will be developed based upon TAM but which reflects the factors that significantly influence physician's acceptance of electronic health records (EHR) in the Hashemite kingdom of Jordan. Finally the model will

be tested and recommendations put forward aimed at motivating and encouraging the adoption and acceptance of EHR systems in Jordan.

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