The Barriers and Facilitators to the Adoption of New Technologies in Public Healthcare Sector: A Qualitative Investigation

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Abstract

The use of new technologies and information systems within healthcare practice provides several advantages and functionalities for healthcare institutions. However, the use of these advanced technologies is not an easy task and the literature has documented several cases of resistance to adopting such technologies by the healthcare staff. Furthermore, governmental reports stated that Iraq healthcare sector is enduring challenges in this regard. For this reason, the current study explored the opinions of healthcare professionals using semi-structured interviews to highlight the important factors and issues that influence the use and adoption of new technologies within Iraq public healthcare sector. To our best knowledge, this empirical study is the first to employ a qualitative approach to address the issue of healthcare information system adoption in Iraq healthcare domain. Twenty six themes have emerged in the findings of this qualitative study which can be helpful for healthcare seniors in order to overcome the present challenges related to the adoption of healthcare information systems and to improve the healthcare practice in general.

Keywords: public healthcare, healthcare information systems, Iraq, Kurdistan Region, qualitative study, adoption

1. Introduction

New technologies implemented in healthcare sector are referred to as Healthcare Information Systems (HIS), and it can be defined as the combination of digital systems and technologies that are designed to assist the healthcare staff to accomplish different medical and administrative tasks within the hospital (Thompson & Brailer, 2004). These technological innovations provide healthcare institutions with many benefits, such as reduced costs, improved administrative tasks, less medical errors, less adverse drug situations, improved access to patients' information, maintaining full medical history for the patients and reducing the size of traditional paper work (Aldosari, 2014; Buntin, Burke, Hoaglin, & Blumenthal, 2011; Goldzweig, Towfigh, Maglione, & Shekelle, 2009; Kaplan & Harris-Salamone, 2009). As a result for theses foreseen advantages, numerous initiatives have been started to establish HIS projects within healthcare institutions and major budgets were invested in these new technologies to upgrade the healthcare infrastructure and improve the healthcare provision for citizens in both western and developing countries (Dobrev et al., 2010; e-Health ERA Report, 2007; Househ, Al-Tuwaijri, & Al-Dosari, 2010; The Department of Health Australian Government, 2010).

However, despite the accumulated expertise in this domain and the foreseen benefits of implementing HIS within hospitals; still, the application of those systems has not always been successful and the literature has documented non-trivial number of HIS projects that faced problems such as delays, over budget issues, low adoption by the healthcare staff and in some cases even failure (Al-Gahtani, 2008; Bah et al., 2011; Baker, Al-Gahtani, & Hubona, 2010; Holden & Karsh, 2010; Kaplan & Harris-Salamone, 2009; Kim & Kankanhalli, 2009; Novak, Anders, Gadd, & Lorenzi, 2012; StandishGroup, 2013; Thakur, Hsu, & Fontenot, 2012). Within the Iraqi context, a governmental report stated that despite the funds allocated for implementing HIS projects in Iraq healthcare sector, the evaluation of these systems concluded that the management and usage of those systems is still disappointing (Ali, Abdulsalam, & Hasan, 2011).

This study aims at identifying the main complexities and challenges facing the usage and adoption of HIS by healthcare staff within public hospitals of Iraq; and to achieve this goal, a qualitative approach was followed using semi-structured interviews. This approach would provide valuable information regarding the actual challenges facing HIS adoption and would help to set appropriate tactics to resolve those issues based on the perceptions of the healthcare professionals themselves.

2. Literature Review

This section presents brief information about the domain of HIS adoption, what factors stimulate this branch of research and how previous studies approached this issue. Multiple motivations drive this academic discipline due its importance and direct relatedness to people's most valuable possession which is their health. Needless to mention that improving healthcare institutions and upgrading the healthcare services for citizens was and still an ongoing process and huge funds are being allocated by governments for this endeavor (Dobrev et al., 2010; e-Health ERA Report, 2007; Househ et al., 2010; The Department of Health Australian Government, 2010). This point highlights the importance of HIS adoption by healthcare staff because failing to do so would cause these immense funds to be wasted and not being exploited; in other words, healthcare officials probably will not have the chance to allocate such funds twice to implement the same project.

However, non-trivial percentage of HIS projects face different challenges and some of them even fail; approximately, 40 percent of these HIS projects either failed or were abandoned (Kaplan & Harris-Salamone, 2009); other HIS systems faced delays, over budget issues and low adoption (Al-Gahtani, 2008; Bah et al., 2011; Baker et al., 2010; Holden & Karsh, 2010; Kaplan & Harris-Salamone, 2009; Kim & Kankanhalli, 2009; Novak et al., 2012; StandishGroup, 2013; Thakur et al., 2012). Moreover, taking into account the nature of those systems being advanced and complex ones (Anderson, 2007; Boonstra & Broekhuis, 2010), the harsh consequences experienced by healthcare professionals when committing medical errors and endangering patients' lives (Herricck, Gorman, & Goodman, 2010), the long office hours and the heavy workload (Boonstra & Broekhuis, 2010), the attributes of the staff and the HIS itself (Boonstra & Broekhuis, 2010; Buntin et al., 2011; Gagnon et al., 2012; Jha et al., 2009); all these factors might negatively affect the adoption of HIS within the healthcare institution. That's why the adoption process must not be underestimated and should be taken seriously by healthcare officials as a condition to ensure the success of those advanced technologies (McGinn et al., 2011; Novak et al., 2012).

Furthermore, several studies stated that the mere existence of new technologies inside the organization does not necessarily mean that it is utilized to its most potentials (Al-Gahtani, 2008; Avgar, Litwin, & Pronovost, 2012; Petter, DeLone, & McLean, 2008). On the other hand, forcing the healthcare staff to use those HIS systems might lead to undesired results (Lapointe & Rivard, 2005). Moreover, each new context and society has its own characteristics and special circumstances that need to be considered carefully (Goldzweig et al., 2009; Holden & Karsh, 2010; Venkatesh & Zhang, 2010), and it would be wrong to suppose that a single and identical solution can be suitable for every environment (Boonstra & Broekhuis, 2010). Additionally, the majority of studies regarding the adoption of HIS are carried out in western countries compared to the number of studies conducted within a Medial East environment (Gagnon et al., 2012; Holden & Karsh, 2010; Hu, Al-Gahtani, & Hu, 2010). Also, a limited number of empirical studies have addressed the issue of HIS adoption by applying qualitative methods (Nieboer, van Hoof, van Hout, Aarts, & Wouters, 2014; Paré & Trudel, 2007; Zakaria, Yusof, & Zakaria, 2009) compared to a much larger size of research that followed a quantitative approach (Aldosari, 2012; AL-Hadban, Hashim, & Yusof, 2016; Holden & Karsh, 2010; Hung, Tsai, & Chuang, 2014; McGinn et al., 2011; Venkatesh, Sykes, & Zhang, 2011); therefore, this adds another motivation to carry out this qualitative study to fill the gap in the literature within the study's new context. What have been presented above emphasizes the scope and encourages the aim of this study which is exploring the opinions of healthcare staff regarding the barriers and facilitators to the usage and adoption of HIS in the Iraqi public hospitals.

3. Methodology

This study used a qualitative approach to accomplish its aim which is exploring the opinions of healthcare professionals regarding the barriers and issues facing the usage and adoption of HIS within Iraq public hospitals; semi-structured interviews (i.e. one-on-one interviews) were employed for this purpose (Creswell, 2012). The reason behind using qualitative methods was to seek in-depth and condensed information about the study's phenomenon (Creswell, 2013). Furthermore, the qualitative method will immerse the researcher into the field to interact directly with individuals (i.e. healthcare staff) whom are actually experiencing the issue under question (i.e. HIS use and adoption), doing so will produce a clear and realistic image about the situation and will put interested peoples' hands on the actual root of the problem; such realistic information could not be acquired by

merely depending on the findings of previously published studies in the literature as each environment and context has its own attributes and conditions (Creswell, 2013; Maxwell, 2012).

Qualitative methods utilize purposeful sampling and the criterion for choosing the appropriate participants is that they should by "information rich" (Patton, 1990, p. 169). However, the choice of a specific sampling technique depends on the objectives of the study and the questions that we are trying to find answers for (Creswell, 2012). This study used the sampling technique Maximal Variation Sampling (MVS); this technique is employed when different perspectives from different individuals or sites are needed to present and describe a clear image about the phenomenon under question (Creswell, 2012). Hence, the researcher identified two sites, the first one is a large size public hospital and the second one is a college of nursing with a total number of eight participants from the two sites. Both sites are located within Kurdistan Region of Iraq (KRI). Kurdistan Region is located at the north of Iraq; it is composed of three states (i.e. Erbil, Sulaimani and Dhok); KRI is a federal region, it has its own local government cabinet and parliament, but it still follows the Iraqi law and constitution (Kurdistan Regional Government, 2015).

The reason for choosing two sites inside KRI is that to enable the researcher to evaluate the most modern healthcare institutions in the country and to assess the most up-to-date developments in the field; of course, from the lenses of people working inside those facilities. The first site that was selected for this study is one of the newest public hospitals in KRI; the name of the hospital will not be revealed to keep the confidentiality of the participants (Creswell, 2012). The reason for selecting this hospital was its large scale in regard to the number of patients it accommodates and the number of staff working in the hospital; also, because the researcher aimed to assess the latest developments in the Iraqi healthcare context. Six individuals were approached from this hospital: four doctors working in different departments (i.e. surgery, radiology and intensive care unit), one nurse and one senior administrative staff. Different participants were chosen to fulfill the property and purpose of MVS (Creswell, 2012).

The second site that was selected is one of the nursing colleges in Kurdistan Region. Two professors from this college were asked to participate in the study. The two professors work as lecturers and they teach classes for both undergraduate and postgraduate students; furthermore, as part of their duties, the two professors conduct practical classes inside the teaching hospital which make them very familiar and in continuous contact with the hospital's practical environment and in touch with the issues that healthcare staff face on daily bases, which make them appropriate candidates to give their opinions and perspectives regarding the study's issue which is the factors affecting the usage and adoption of HIS within public hospitals. Choosing two site and two groups of participants for this study was to increase the validity and objectivity of the findings and to make use of different opinions in order to reach a better understanding about the situation (Creswell, 2012).

4. Data Collection

Semi-structured interviews were exploited for conducting this empirical study. Although it is a time consuming method, but it allows the interviewees (i.e. the healthcare staff) to express their opinions in a free and spontaneous manner (Creswell, 2012; Maxwell, 2012). The same open ended questions were used with all the participants. Each interview started with a very general question about the participant's name, age, current position and previous experiences to break the ice. The following questions regarding the challenges and issues encountered with HIS were general in nature (i.e. no leading questions were used in order to keep the neutral role of the researcher). Probing questions were also used to get more details about the study's issue (Creswell, 2012); for example, "can you explain more" or "can you give me examples" or "any further notes would you like to add". All interviews were recorded using a digital recording device and notes were also taken during the interview as a precautionary measure (Creswell, 2012).

Ethical considerations were also maintained throughout the procedure (Creswell, 2012, 2013). An official request letters were submitted to both sites (i.e. the hospital and the nursing college) to get their approvals to conduct the study; once the approvals were obtained, the participants were approached and were handed an informed consent form declaring the study's scope, objectives and that their identity's confidentiality will be preserved. Simple tokens were also presented to the participants at the end of the interview as a gesture of gratitude. After conducting the interview, a transcription of the interview along with the themes extracted from it were handed to each interviewee to be read and checked by him/her; their notes and corrections were considered and then their signatures on the report were obtained later on. This process (i.e. the member checking) was carried out with every participant to ensure the validity and the trustworthiness of the research process (Creswell, 2012).

5. Data Analysis

The analysis procedure followed by this study is interpretive analysis (Sayre, 2001); in this approach the researcher puts himself in the participant's spot and attempts to see the world from the participant's lenses; the researcher attempts to derive the concepts and understand the meaning behind the participant's words to make sense of the participant's world. However, the systematic steps to carry out the method were adopted from Creswell (2012) and as follows. The approach starts by 1) producing a transcription of the audio recording, 2) reading through the whole text in order for the researcher to get a general sense of the interviewee's responses, 3) coding the transcription and trying to understand the meaning behind those codes and generating themes from the coded data, 4) interrelating and connecting the dots between themes in order to reduce their number and produce broader concepts; in this step relating to previous literature can be helpful, 5) the final step would be validating the accuracy of the findings to assure the study's trustworthiness (Creswell, 2012).

Validating the findings is an important issue in academic research; it means that the researcher should determine certain strategies to validate the study's findings and assure the accuracy of the researcher's interpretation (Creswell, 2012; Maxwell, 2012). For this study, two validation strategies were employed, triangulation and member checking (Creswell, 2012). Triangulation means that the researcher seeks multiple evidences from different individuals, processes or sites to provide multiple support for themes extracted from the qualitative data (Creswell, 2012); this will confirm the accuracy of the study findings because the same issue has been referred to by several sites and individuals. In this study, this objective has been accomplished by selecting two different sites and selecting different respondents from those sites. The second validation strategy was member checking (Creswell, 2012). In member checking, the researcher asks one or more interviewees to check the interpretation of the transcription whether it was accurate and credible and whether the researcher properly understood the participant's intent. In our case, member checking was applied with every respondent in the study to assert the study's credibility to the maximum.

6. Results and Discussion

This section presents the findings and the themes that were extracted from the eight interviews conducted within this qualitative study. The analysis process aimed at describing the main issues and challenges that healthcare staff encounters in regard to the usage and adoption of HIS within Iraq public hospitals. Highlighting these important issues will help to draw the appropriate strategies that could be undertaken to maximize the usage and adoption of HIS and consequently ensure its success. The eight interviewees in this study are denoted from R1 to R8. Worthwhile, several interviewees affirmed the existence of the issue the study is trying to tackle which is the low usage and adoption of HIS within the public hospitals: R1: "in governmental hospitals, we have low usage of computers"; R2: "they have shortness in using the information technology in the health system"; R6: "in regard to the use of HIS, it is still low".

Furthermore, the respondents reported several topics and themes within their reflections and accumulatively 26 themes were elicited from the responses of the interviewees; these 26 themes were grouped under four main categories (i.e. individual, technological, organizational and environmental), following the approach of (Jeyaraj et al., 2006).

The individual dimension encapsulates the personal perceptions and the individual characteristics of the person himself/herself which influences his/her behavior regarding the phenomenon under question (Jeyaraj et al., 2006). The participants revealed several topics like culture which was affirmed by several participants asserting that the society being a traditional one and that staff having low willingness to exercise new techniques or new work procedures: R6: "patients don't want to spend 10 minutes answering questions for data entry"; R1: "some of the nurses, within their cultural background they are not exposed to computers at home"; R2: "I think we need to develop our culture".

Also, the issue of staff lacking fluent English language has been denoted by multiple respondents as a barrier to using these HIS systems as it require a certain knowledge about the specific terminology and the ability to comprehend the systems' output: R5: "the English language is a major defect"; R7: "the first problem is language"; R8: "the staff is committed to one language, which is the Kurdish".

Two respondents stated that job-position of the staff inside the hospital might be a factor, stating that hospital's focus is on the doctors and it is neglecting other staff members like nurses in regard to training: R1: "we have low training for nurses, the priority for doctors"; R5: "hierarchy between staff and the doctors".

The previous point (i.e. job-position) could also be interpreted as organizational inequality towards the staff by putting more focus, attention and resources for one part of the staff like doctors and underestimating the rest; this

factor could be considered as an organizational factor.

Education level was also mentioned by two participants as a possible cause for low usage: R1: "education level of the nurses affects the usage of healthcare information system"; R5: "the sub-staff have low education".

Other interviewees also expressed age as a potential factor affecting the usage of HIS, as old staff being used to traditional work routines and being less eager to switch to different work methods: R1: "old nurses are not using the computer"; R4: "old doctors refuse to use the new technology".

Other respondents expressed an issue of the staff having low motivations to use these new systems or perhaps it is related to having low innovativeness: R2: "they are not motivated"; R4: "they like to do things the traditional way, the way they are used to".

Some of the factors were mentioned only once by the participants as barriers, such as low experience; job-insecurity, as detailed documentation and diagnoses for each patient can be used against the staff member in case of a medical error is committed; and low self-confidence of nurses to use new technologies: R4: "lack of experience and lack of knowledge about the new systems"; R8: "the system is operational but it is not used, the doctor is afraid to write the diagnoses and save it to the system"; R1: "low knowledge regarding this issue, and this leads them to what? leads them to no self-confidence".

Several individual factors were captured by the current study (i.e. culture, English language proficiency, job-position, educational level, age, innovativeness, low experience, low self-confidence and job-insecurity), those factors were also studied by other studies as contributors to the adoption of new technologies within healthcare context (Al-Gahtani, 2008; Hage, Roo, van Offenbeek, & Boonstra, 2013; Laumer, Maier, Eckhardt, & Weitzel, 2015; Venkatesh et al., 2011; Yang, Tsao, Lay, Chen, & Liou, 2008).

Additionally, technological dimension includes the properties and the attributes of the technology itself that might affect its usage and adoption (Jeyaraj et al., 2006). Several participants mentioned that the lack of connectivity and integration with other healthcare institutions is an issue that needs to be considered to encourage the staff to use those systems and make full benefit of its potentials: R2: "no cooperation between this healthcare center and other healthcare centers"; R4: "no intranet connection between hospitals"; R6: "the system is not connected with other hospitals"; R8: "no connectivity with other health institutions".

System quality concerns and system malfunctioning were also underlined by the majority of respondents as barriers because it decreases the trust in these systems; lacking certain functionalities within some systems was also considered a negative point as this technology was unable to perform all the expected duties: R5: "we have a system but without its supporting parts"; R6: "the system stopped temporarily because of operational problems"; R8: "we have problems in the hospital warehouse system".

Furthermore, the absence of a unified patient identification system was also a matter worthy of noticing as it would organize the patients' data, simplify the administrative tasks, reduce the redundancy of the same information and minimize the size of paper work: R5: "we have no personal ID for the patients"; R8: "we need unified patient ID system".

Also, one of the participants expressed some compatibility issues and concerns about the privacy and the security of the patient's data: R2: "they are not used on the usage of information system"; R2: "they feel the information is not protected, there is no security".

The technological factors that were identified by the current study (i.e. lack of integration, system quality, lack of standardization, compatibility, security issues) represented the technical barriers as perceived by the healthcare staff within the Iraqi healthcare context; however, such technological factors were also mentioned and studied within the literature of technology adoption (Boonstra & Broekhuis, 2010; Holden & Karsh, 2010; McGinn et al., 2011; Nieboer et al., 2014).

Moreover, the organizational dimension includes the barriers that are related to the administration and the management of the organization (Jeyaraj et al., 2006), as perceived by healthcare staff in this study. Low training programs provided by the hospital management was mentioned and noted by several participants as a barrier to the use and adoption of HIS projects: R2: "we have shortness of training courses"; R3: "we should be provided with training courses"; R6: "the staff is not trained properly"; R8: "the staff needs training".

Not providing skillful maintenance teams can affect the use of HIS, as routine problems within a system and those teams being unable to solve it in some cases can cause the system to stop working: R3: "inexperienced maintenance team"; R4: "lack of IT staff"; R7: "we don't have good maintenance teams".

Moreover, having the wrong person in the wrong position could cause the hospital's departments to be incapable

of fulfilling a vision of employing new technologies in healthcare provision as those healthcare officials lacking the required professional qualities and lacking a futuristic foresight: R2: "this manager is not educated about information technology, for this reason he doesn't like other ones to use it"; R5: "we don't have the right person in the right place"; R7: "the administration does not realize the importance of HIS".

Lacking a motivational or a rewarding work environment was mentioned by some participants as a barrier; some issues were also declared only once by the participants, such as the lack of communication between top management and the staff and long routine procedures within the hospital: R5: "there is no promotion, that's why there is no will of getting better, no one to tell you that you did a good job"; R4: "we don't have a committee that represent all departments of the hospital to help face all the hospital issues"; R5: "it is a long sequence and at the end you will not get anything".

The healthcare staff expressed several organizational factors (i.e. low training, management support, shortage of skillful maintenance staff, management innovativeness, motivational system, long administrative routine) that could influence their behavior regarding the usage of new technologies in their daily work; other researchers have also examined such organizational factors and their effect within different settings (Hage et al., 2013; Lambrou, Kontodimopoulos, & Niakas, 2010; Lluch, 2011; Nieboer et al., 2014; Thakur et al., 2012).

On the other hand, environmental dimension involves factors and issues that are situated outside the control of the hospital or the healthcare staff (Jeyaraj et al., 2006). Heavy workload inside public hospitals was the most mentioned factor to affect the use of HIS, as limited number of healthcare staff needs to cope and handle large number of patients on daily basis without adding further duties to their busy schedule: R1: "it is time consuming for nurses to use these systems"; R2: "shortness of staff"; R5: "here in ICU they work for 24 hours"; R6: "the number of patients coming to the hospital is high"; R8: "we have work load".

Shortage of the financial support was also highlighted as an additional factor by several interviewees, as this factor affects the quality of the HIS systems purchased for hospitals; financial factor also influences the availability of training courses needed to master those systems and the availability of maintenance and follow-up programs: R2: "there is shortness of budget in the healthcare system in our governorate"; R3: "management without financial support can't do a lot"; R4: "the governmental support now is less because of the financial crises"; R6: "for financial reasons the internet service has stopped".

Furthermore, low commitment of some vendor companies or the vendor's low experience in the field of HIS was also considered by the interviewees as one of the barriers that discourage the use of these systems, as those systems need proactive follow-up programs and after sale services to face any potential glitches to ensure the continuous functioning of those systems and subsequently the successful implementation of the HIS projects: R5: "they should come here and give lectures to our staff about how this system is working"; R6: "the company brought trainers, but they weren't efficient"; R7: "we are not comfortable with the company's policy".

Another important issue was brought up by other participants which is the defect in curriculums in the educational system which does not take into consideration improving the important skills required by healthcare staff to acquire, which causes new graduates to be lacking the knowledge and self-efficacy to use advanced HIS within the hospital's practical environment: R1: "college graduate nurses use the computer better than institute graduates"; R2: "some of them are not educated about using the computers"; R5: "teaching is affecting all the system".

Two staff members also declared that frequent electricity blackouts is an important and annoying matter that cause to interrupt the functioning of these HIS, which negatively affects staff's perception about those systems and cause them to discontinue using them: R1: "the electricity is one of the issues"; R2: "we have a problem of electricity in Iraq".

Worthy of mentioning, two participants stated that the availability of effective healthcare insurance system might be a solution, since such insurance system could provide the fundamental funds and resources required to remove some of the obstacles, elevate the healthcare crew capabilities and improve the healthcare infrastructure: R2: "we have no insurance system in our country"; R5: "I think that insurance is the best way".

Additionally, participants in the study gave notice to the difference between the public and the private sector in regard to the use and adoption of HIS and asserting that the private sector is more advanced in terms of HIS implementation and adoption: R1: "private hospitals are better"; R5: "private hospitals, they are much better".

Several environmental (i.e. external) issues have emerged throughout the interviews (i.e. workload, financial support or governmental support, vendor support, educational system, infrastructure, insurance system) and the related literature has come across such issues in previous studies (Aldosari, 2012; Boonstra & Broekhuis, 2010;

El-Gohary, 2012; Kale & Goh, 2014; Lluch, 2011). As a result, Table 1 presents the themes that were highlighted in the current study in a structured format.

Table 1. Themes extracted from the interviews

Category	Theme
Individual	Culture, English language proficiency, Job-position,
	Educational level, Age, Innovativeness, Low experience
	Low self-confidence, Job-insecurity
Technological	Lack of integration, System quality,
	Lack of standardization, Compatibility, Security issues
Organizational	Low training, Management support,
	Shortage of skillful maintenance staff,
	Management innovativeness, Motivational system,
	long administrative routine
Environmental	Workload, Financial support or Governmental support,
	Vendor support, Educational system, Infrastructure,
	Insurance system

7. Conclusions

The current study aimed at exploring the actual factors and issues that affect the use and adoption of HIS within Iraq public hospitals; and in order to make an in-depth inquiry about those barriers and to build a clear comprehension about the situation, the study employed a qualitative approach using semi-structured interviews to achieve the study's objective. Reviewing the opinions of different healthcare professionals from different sites helped to look at the situation from different angles to draw a clear and realistic image concerning the study's issue. Twenty-six themes were extracted from the interviewees' responses; those themes were grouped under four main categories (i.e. individual, technological, organizational and environmental). The current study followed a general perspective in regard to the type of HIS assessed (i.e. it did not specify a certain technology per se); the study considered all types of HIS within the hospital's borders.

The lessons learned from this study, is that a combination of factors affect healthcare staff members in regard to the usage and adoption of HIS and those factors can broadly fall under four categories (i.e. individual, technological, organizational and environmental). All these dimensions should be considered equally and seriously when implementing HIS projects as each one of those dimensions represent an important aspect of the implementation and the adoption process. The current study recommends two strategies for healthcare officials and policy makers; two separate strategies but nevertheless complementing to each other in futuristic HIS projects. The first strategy is a short-term one that focuses on selecting credible and reliable HIS vendors to execute HIS projects; those vendors would commit themselves to provide the appropriate and adequate support in regard to training the staff, providing on-site help and preparing skillful maintenance teams. The second strategy is a long-term one that concentrates on improving the essential infrastructure needed to deploy HIS projects and developing proactive educational plans that would incorporate spreading the awareness about HIS importance and leveraging its use by providing practical training at the pre-graduation stage for healthcare specialized students (i.e. before they enter the actual domain).

Future work in this area can involve several directions, such as conducting quantitative studies that would incorporate the themes (i.e. factors) that were highlighted in this study into technology adoption theories and retrieve the responses of a large-size sample of participants which provides the generalizability for the findings of the current study. Furthermore, studies revolving around a specific type of HIS and a specific category of healthcare professionals would be a logical idea to underline the issues that are related to such specific settings. Moreover, evaluating the private healthcare sector or implementing a comparison between public and private sectors can be very beneficial as it will try to fill the gap between the two domains and present the challenges, pros and cons of each one in order to learn more about the healthcare provision in Iraq. Finally, the current study

can be used as a foundation by policy makers to put better plans for futuristic HIS projects and as a starting point for other researchers within the domain of healthcare information systems in Iraq.

Acknowledgments

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