INVESTIGATING THE HIS ADOPTION IN PRIVATE HEALTHCARE SECTOR IN IRAQ USING UTAUT MODEL

YOUSIF WAHAB

AUGUST 2017

INVESTIGATING THE HIS ADOPTION IN PRIVATE HEALTHCARE SECTOR IN IRAQ USING UTAUT MODEL

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED
SCIENCES OF
ÇANKAYA UNIVERSITY

BY
YOUSIF WAHAB

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF
MASTER OF SCIENCE
IN
THE DEPARTMENT OF MATHEMATICS
INFORMATION TECHNOLOGY PROGRAM

AUGUST 2017

Title of the Thesis: **Investigating the HIS Adoption in Private Healthcare Sector in Iraq Using UTAUT Model**
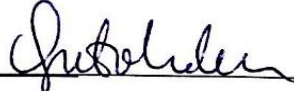
Submitted by **Yousif WAHAB**

Approval of the Graduate School of Natural and Applied Sciences, Çankaya University.

Prof. Dr. Can ÇOĞUN
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Assoc. Prof. Dr. Fahd JARAD
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Assist. Prof. Dr. Gül TOKDEMIR
Supervisor

Examination Date: 4.8.2017

Examining Committee Members

Assis. Prof. Dr. Gül TOKDEMIR	(Çankaya Univ.)
Assist. Prof. Dr. Reza HASSANPOUR	(Çankaya Univ.)
Assist. Prof. Dr. Özkan KILIÇ	(Ankara Yıldırım Beyazıt Univ.)

STATEMENT OF NON-PLAGIARISM PAGE

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name : Yousif WAHAB

Signature :

Date : 19/09/2017

ABSTRACT

INVESTIGATING THE HIS ADOPTION IN PRIVATE HEALTHCARE SECTOR IN IRAQ USING UTAUT MODEL

WAHAB, Yousif

M.Sc. Department of Mathematics /Information Technology Program
Supervisor: Assist Prof. Dr. Gül TOKDEMIR

August. 2017, 72 pages

The study emphasizes the implications of technology integration across the private healthcare sector of Iraq. In this regard, the study has focused the technology of HIS "Health Information System", as the potential construct of electronic - health (e-health) systems. The relevant literature has been reviewed to gain insights on e-health and the significance of HIS adoption as well, followed by the identification of certain challenges or constraints towards HIS adoption across the Iraqi healthcare domain. Accordingly, the research has also assessed the effectiveness of deploying UTAUT model for determining the adoption of HIS technology across the targeted domain. By means of conducting an online survey across 250 randomly sampled participants, the researcher has gained 204 valid responses. Factor analysis, Correlation analysis, and Regression analysis techniques have governed the effectiveness of the UTAUT model in terms of assessing the adoption of HIS across the private healthcare sector of Iraq. Three of the null hypotheses have been rejected and one of them has been accepted, ascertaining the significant impacts of the identified variables (*Performance Expectancy (PE), Social Influence (SI), and Facilitating Conditions (FC)*) on the *Behavioural Intention* (BI) towards HIS

adoption, except *Effort Expectancy (EE)*. Furthermore, *User Behaviour (UB)* also has a significant relationship with the *Behavioural Intention (BI)*.

Keywords: HEALTH INFORMATION SYSTEMS, UTAUT, HIS ADOPTION.

ÖZ

IRAK'TAKİ ÖZEL SAĞLIK KURUMLARINDA HIS ADAPTASYONUNUN UTAUT MODELİKULLANILARAK ARAŞTIRILMASI

WAHAB, Yousif

Yüksek Lisans, Matematik / Bilgi Teknolojisi Programı

Tez Yöneticisi: Yrd. Doç. Dr. Gül TOKDEMIR

Ağustos 2017, 72 sayfa

Çalışma, Irak'ın özel sağlık sektöründe teknoloji entegrasyonunun etkilerini vurgulamaktadır. Bu bağlamda, çalışma, elektronik sağlık (e-sağlık) sistemlerinin olası yapısı olan HIS "Sağlık Bilgi Sistemi" teknolojisine yoğunlaşmıştırr. E-sağlığın ve HIS'in benimsenmesinin öneminin kavranması için ilgili literatür gözden geçirilmiş bunu takiben Irak'ın sağlık alanı boyunca HIS'in benimsenmesine yönelik bazı zorluk ve kısıtlamaların ortaya çıkması sağlanmıştır. HIS 'in özel saplık sektöründeki adaptasyon faktörlerinin ortaya çıkartılması amacıyla UTAUT modeli kullanılmıştır. Bu amaçla, rastgele seçilen 250 rastgele katılımcı üzerinden çevrimiçi bir anket uygulanmış, 204 adet geçerli yanıt elde edilmiştir. HIS'in özel sağlık sektöründe benimsenmesinin değerlendirilmesi açısından UTAUT modelinin etkinliği, Faktör analizi, Korelasyon Analizi ve Regresyon analizi teknikleri ile ortaya çıkartılmıştır. Davranış Niyeti (BI) üzerinde HIS'in benimsenmesine ilişkin Çaba dışı Beklenti (EE) dışındaki tüm belirlenen değişkenlerin (Performans Beklentisi (PE), Sosyal Etki (SI) ve Kolaylaştırıcı Durumların (FC)) önemli etkilerini saptamak amaçlı tüm boş hipotezler reddedilmiş, ayrıca Kullanıcı Davranışı (UB) ve

Davranış Niyeti (BI) arasında önemli bir ilişki ortaya çıkmıştır.

Anahtar Kelimeler: Sağlik Bilgi Sistemleri, UTAUT, HIS Kabullenmesi

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

HIS	Health Information System
TRA	Theory of Reasoned Action
TAM	Technology Acceptance Model
UTAUT	Unified Theory of Acceptance and Use of Technology
ICT	Information and Communications Technology
E-health	Electronic Health
EHR	Electronic Health Record
EMR	Electronic Medical Record
CPOE	Computerized Physician Order Entry Systems
EPR	Electronic Patient Record
WHO	World Health Organization
ANOVA	Analysis Of Variance

CHAPTER 1

INTRODUCTION

In this chapter of the thesis, the introductory elements of the research process are briefly presented that explains the overall research plan. Besides, the background of the research area is also presented, validating the need of this particular research. This particular study is based on assessing the acceptance of HIS adoption across the private healthcare sector of Iraq, in order to claim the implications of e-health within the respective sector. In this regard, the problem statement, formulated research objectives, research hypotheses, planned research strategy, and significance of the study are underpinned.

1.1 Background

Reliable and credible information is the main element that governs the appropriateness of the decision-making process all across the healthcare systems. The importance of consistent and sound information is critical to the formulation and implementation of health policies, research, training and education needs across the healthcare, regulation, and governance, prompt and quality delivery of services, and the area of financing as well. Accordingly, the Health Metrics Network Framework of World Health Organization, (2008) has defined the decision making process of healthcare in terms of Health Information System -HIS. According to the report, the HIS underpins the most crucial aspects of the decision-making process needed in the

healthcare domain. HIS facilitates the process of decision-making in terms of four key areas of generating, compiling, analyzing, and synthesizing, and then communicating and using the data across the respective areas. Primarily, HIS is entitled to gather data from the relevant areas, which is then analyzed along with the assurance of quality, timeliness, and relevance. The collected data is then transformed into quality information that facilitates the healthcare process in terms of effective decision-making (World Health Organization, 2007; 2008).

Al-Hadban, (2016) has documented that HIS is basically the combined systematic representation of both the hardware and software elements of storing, retrieving, communicating and using the information of patients to take appropriate and prompt decisions. Even though, HIS seems to be having multiple systems within its framework, yet its functionality is categorized into three areas of administrative, clinical, and strategic processes (Menachemi, and Collum, 2011). All these three areas are unique in their respective performance outcomes, but the objectives are identical to minimize the operational costs, improve the healthcare accessibility, and reduced medical errors of diagnosis and treatment needs of patients' care (Buntin, et al., 2011; Herrick, et al., 2010). Numerous studies have yielded the outcomes that multiple projects of HIS have been encountering increasingly challenging situations, inclusive of EHR - Electronic Health Records, EMR - Electronic Medical Records, and others as well. Accordingly, lower adoption has been acquired, particularly due to the resistance from staff and other administrative personnel (Kaplan and Harris-Salamone, 2009; Ali et al., 2011; Holden and Karsh, 2010; Novak et al., 2012; Kijsanayotin, et al., 2009).

According to Ngafeeson, (2015) the prospects of successful implementation of HIS instill the assurance of its maximum adoption across the domain. HIS is contended to enhance the quality of the services and the legibility as well, in terms of shrinking the costs and reducing the medical errors efficiently. With the technological attribute of HIS, the healthcare sector is presented with massive opportunities of being transformed to deliver improved services. Even though, the implications of technological integration have been beneficial to the business environments, regardless of the nature of the industry, there have been certain challenges or constraints towards the acceptance of these technological aspects as well. Considering the users or personnel in the healthcare sector, these challenges have been intensive due to the denial of information technology from its potential users. About three to four decades ago, the healthcare system of Iraq had substantially improved status even without technology, but the healthcare providers and the policy makers were aimed at ensuring high standards of healthcare delivery. Afterwards, the country was ruled by the regime which had no concerns regarding the healthcare enhancement of the state; thus, the continuous neglect and the inadequately allocated budgetary aspects led the healthcare system towards being entirely deteriorated, leaving the public at the worst health conditions.

Accordingly, the health status of the country fell to the level of most underdeveloped countries, which eventually resulted in the escape of the highly experienced and competent healthcare professionals from the country. As a result, the country faced a notable gap in the quality delivery of the healthcare services, and the situation got increasingly worse with the exacerbation of major wars, economic and political sanctions, and the disastrous adventures of the military forces (Alwan, 2004). In this

3

particular study, the healthcare sector of Iraq has been targeted in terms of evaluating the adoption level of HIS across the private healthcare sector. The target of the study represents the crucial needs of the research, since Iraq has a gloomy history of worsening healthcare systems due to its long spanned war times. The typical war conditions and the associated inefficacy of the regime to manage the state conditions left the country far behind in terms of being technologically aligned that is evident from its yearly rate of internet penetration (Table below).

Table 1: Internet Penetration of Iraq during 2010-2016

Year	Internet Users**	Penetration (% of Pop)	Total Population	Non-Users (Internetless)	1Y User Change	1Y User Change	Population Change
2016*	4,892,463	13 %	37,547,686	32,655,223	7.5 %	339,539	3.09 %
2015*	4,552,924	12.5 %	36,423,395	31,870,471	14.2 %	567,042	3.26 %
2014	3,985,882	11.3 %	35,273,293	31,287,411	27 %	848,004	3.42 %
2013	3,137,878	9.2 %	34,107,366	30,969,488	34.1 %	797,887	3.49 %
2012	2,339,991	7.1 %	32,957,622	30,617,631	46.9 %	746,603	3.42 %
2011	1,593,388	5 %	31,867,758	30,274,370	106.5 %	821,684	3.24 %
2010	771,704	2.5 %	30,868,156	30,096,452	142.9 %	454,015	2.99 %

Source: (Internet Live Stats, 2017)

It is noted that the internet penetration of Iraq is not up to-the-mark that would govern the projected adoption of any possible technological integration across its healthcare sector. It also reflects that the prospect of deploying particular HIS across the healthcare sector of Iraq has certainly encounters intense level of challenging situations, from both the public sector and professionals as well. It has been asserted based on the fact that the professionals inclusive of the doctors, nurses, and other administration staff have long been using the conventional modes of decisions

regarding diagnosis and treatment needs of the patients. Reviewing the literature based on the problem under consideration, it has been established that the adoption of HIS has mainly been disappointing across the Iraqi healthcare domain. However, it has also been noted that the literature in this regard, potentially lacks in presenting credible outcomes, as studies have been empirically conducted to make relevant assertions; thus, having the loophole of generalizing the findings (Alshamari, et al., 2014; Boonstra and Broekhuis, 2010; Williams, et al., 2015). Most importantly, numerous studies have highlighted that there has been extensive resistance from the staff towards HIS adoption, mainly based on their reduced knowledge level of IT (Bah et al., 2011; Hung, et al., 2014; Cresswell and Shiekh, 2013; Gücin, and Berk, 2015).

In order to transform the conventional modes of system execution into the contemporary aspects of ICT (Information and Communication Technology) integration, the study has recognized to emphasize the adoption of HIS across the potential information users, rather than the perspectives of consumers or patients. Therefore, the study has adopted quantitative measures of collecting direct information regarding the adoption of HIS among the personnel of the healthcare sector of Iraq, particularly the private domain, and the responses have been evaluated with the integration of UTAUT model.

1.2 Theoretical Framework

The deployment of technology within a sector is regarded as successful, if the potential users reflect a significant level of acceptance in terms of its adoption. The adoption of technology has long been a challenging element among the users; thus, making the situation concerned for the policy makers and other representative authorities. In this regard, it has been asserted that appropriate decision-making is crucial, even before the deployment of an advanced or innovative technology, particularly if the target population is not aligned with the efficacy of the technological solutions. With respect to the assessment of technology adoption across a particular segment or industry, numerous studies have affirmed the efficacy of TAM - "Technology Acceptance Model". It has been based on the fact that TAM yields assessment of the perceived usability and benefits of the technology along with the concerned aspect of ease of use as well (Park 2009; Park, et al., 2009; Cheung, and Vogel, 2013; Holden, and Karsh, 2010). Based on the results, the policy makers or the decision makers are potentially capable of incorporating effective measures to improve the resulting consequences of a particular technology deployment.

With the increasing research efforts, even TAM has acquired advancements in terms of the formulation of UTAUT model (shown below) (Alharbi 2014; Cheon *et al.* 2012; Moryson and Moeser 2016). UTAUT model is contended to have the performance attributes of both the behavioral responses (TAM) and psychological impacts (TRA-Theory of Reasoned Action) pertaining to the user adoption of the technology. The consideration of TRA integrates the behavioral aspects of the knowledge acquisition with respect to the adoption of technology. It is focused on

the prospect of perceived beliefs of the users that are eventually influential over the actions of the users or responses towards the deployment of an innovative or somewhat new technological measure (Venkatesh, et al., 2012).

Consequently, this particular study has also selected the model of UTAUT to assess the HIS adoption across the private healthcare sector of Iraq. In this regard, the significant variables of UTAUT have been productive in generating the study outcomes; with respect to the projected HIS adoption across the targeted segment. The identified variables of *Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)* are referred as the independent ones that ultimately tend to determine the dependent variables of *Use Behaviour - UB and Behavioural Intention - BI,* in terms of determining the HIS adoption. It is notified here that age group, gender, education level, employment position, and internet knowledge are measured in this study in order to explore and understand the participants' characteristics. Moreover, the method of measurement of these variables does not allow statistical analysis, such as correlation and regression, with the main variables of the study. Although the main variables are measured on a 5-point scale, it is assumed that they can be used for factor analysis, and other statistical test.
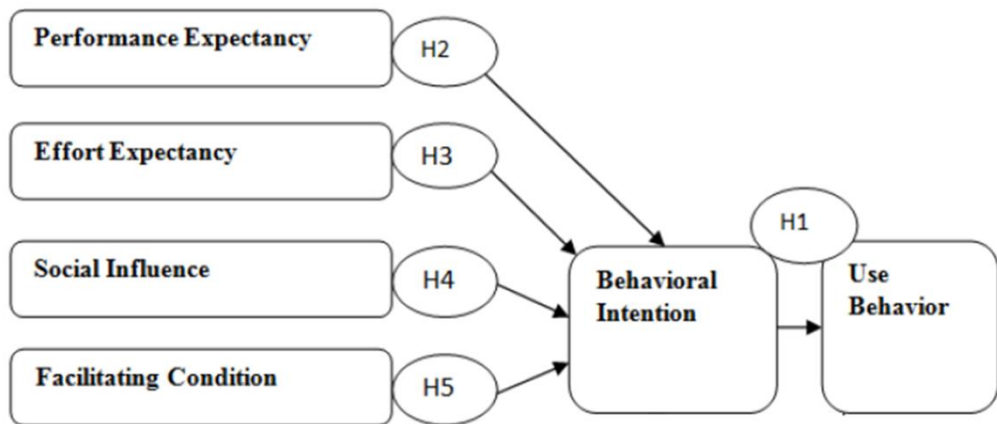
Figure 1: Conceptual Framework based on UTAUT Model

Within the healthcare domain, the implications of UTAUT are affirmed from the literature. It affirms the credibility of this technology-adoption assessment model in terms of its instilled benefits of applicability and generalizability, irrespective of the nature of the industry. Conversely, there have been prospects of requiring additional testing needs, regarding the implications of UTAUT within the healthcare-based study context (Venkatesh, et al., 2012). However, it does not affect the credibility of UTAUT in dealing effectively with the diverse fields, and the different types of participants as well, based on its uniqueness and decisively identified constructs. Therefore, the current study has maximally utilised the benefits instilled in this particular method of assessing technology adoption.

1.3 Problem Statement

The background information regarding this particular study context has led to the assertions that the relevant literature has not appropriately collected the reliable or sound findings for the technological penetration of Iraqi's healthcare sector. Besides, it has also been observed that the Iraq's healthcare sector is far behind the integration

of technology in real, which is contended to be based on the potential resistance from the administrative staff and other representatives. However, the current business trends and the critical state of public health status demands the integration of technology based patient care. In this regard, it has also been recognized that the deployment of such technological elements like HIS is anticipated to be a successful effort, as there is no chance of failure. Therefore, it needs to be ensured that the adoption of HIS is assessed first, so that appropriate measures with respect to the decision-making process would be recommended to the respective authorities.

1.4 Research Aim and Objectives

The research aims at identifying the current status of HIS adoption across the private healthcare sector of Iraq, by means of using the UTAUT model. Accordingly, following objectives have been formulated:

- To understand the concept of e-health
- To identify the constructs of e-health as Health Information System - HIS
- To recognize the significance of deploying HIS across the healthcare sector
- To investigate the potential benefits and challenges of HIS adoption across the private healthcare sector in Iraq
- To examine the effective deployment of "Unified Theory of Acceptance and Use of Technology (UTAUT)" in determining the HIS adoption among the Iraqi private healthcare providers
- To make recommendations to the Iraqi healthcare sector and policy makers regarding successful deployment of HIS across the healthcare domain.

1.5 Research Hypotheses

After formulating the objectives of the study, the researcher has also devised the hypotheses of this study that are assessed in terms of validation or noted to be nullified on the basis of the findings of the UTAUT model. Below are the hypotheses of the study:

$H_{1.0}$: Behavioural Intention has no significant impact on User behaviour.

$H_{1.1}$: Behavioural Intention has significant impact on User behaviour.

$H_{2.0}$: Performance Expectancy (PE) has no significant impact on the Behavioural Intention to use HIS.

$H_{2.1}$: Performance Expectancy (PE) has significant impact on the Behavioural Intention to use HIS.

$H_{3.0}$: Effort Expectancy (EE) has no significant impact on the Behavioural Intention to use HIS.

$H_{3.1}$: Effort Expectancy (EE) has significant impact on the Behavioural Intention to use HIS.

$H_{4.0}$: Social Influence (SI) has no significant impact on the Behavioural Intention to use HIS.

$H_{4.1}$: Social Influence (SI) has significant impact on the Behavioural Intention to use HIS.

$H_{5.0}$: Facilitating Conditions (FC) have no significant impact on the Use Behaviour of HIS.

$H_{5.1}$: Facilitating Conditions (FC) have significant impact on the Use Behaviour of HIS.

1.6 Research Methodology

With respect to the successful accomplishment of the objectives of a study, the importance of adopting an appropriate research methodology is undeniable. If the adopted approach of collecting and analyzing data is appropriate pertaining to the study context, the prospect of success of the study is ascertained (Bryman and Bell, 2015). Therefore, the current study has employed quantitative research approach in particular, since the prime objective has been the collection of direct data from the potential users of HIS. In this regard, an online survey questionnaire has been conducted based on the UTAUT constructs of assessing the HIS adoption across the participants. By means of randomly sampling the potential participants across the private healthcare sector of Iraq, including the doctors, administrative staff, and the IT specialists as well, the study has gathered a considerable and a credible amount of data, since the relevant ethical aspects of human participation have also been ensured. The overall process was carried out on the personal computer having the features of CPU: Core i7 and RAM: 8 GB. Besides, the researcher has also reviewed the relevant literature as well, in order to acquire better insights of the study context; thus, affirming the credibility and relevance of the questions included in the designed questionnaire. Afterwards, analysis techniques of descriptive statistics, factor analysis, correlation and regression analysis have been used to enhance the credibility of the research findings.

1.7 Significance of the Study

The data management and information processing system in the healthcare sector is noted to have certain loopholes that reflect an inadequate decision-making process. However, it needs to be ensured that the patient care is of the utmost preference, since the wrong or inappropriate decisions regarding the diagnosis or treatment of a particular case would eventually result in adversities; thus, affecting the health status of the entire state. A country having poor health statistics lags behind in terms of being a competitive economy. Therefore, the quality delivery of healthcare services needs to be considered at all the levels. This particular realization brings in the notions of integrating technological elements within the decision-making processes of healthcare, since the availability of credible information would be governed with the implications of the technologically aligned processes. However, the acceptance of technology is another considerable area, since the attempt would be a failure if the potential users have no significant acceptance. Based on this particular scenario's prevalence across the healthcare sector of Iraq, this study is going to be a significant contribution in terms of facilitating the policy makers and other representatives of the system to take the most effective decisions, while deploying HIS across the sector. The proficiencies of HIS in terms of being increasingly Accessible, Legible, Adaptive, Structural, Reusable, and Flexible would be ascertained.

1.8 Thesis Structure

The entire thesis is structured as:

Chapter 1 comprises the basic elements of the study that reflect the entire research plan. It presents the background information that leads to the comprehensively developed problem statement. Additionally, it also presents the essential elements of research objectives, research hypotheses, the adopted method, and the potential significance of the study as well.

Chapter 2 is primarily the collective composition of the relevant literature, which identifies the importance of the study context, and certain implications as well. It reflects that the researcher has considerable knowledge regarding the problem focus.

Chapter 3 incorporates the description of all the important elements of the research methodology, throughout the collection and analysis of the relevant data.

Chapter 4 is having the acquired findings of the survey questionnaire, based on the identified constructs of UTAUT model.

Chapter 5 presents the overall concluding remarks of the study, which facilitate the researcher in making appropriate recommendations or potential direction for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The chapter reviews the diverse literature that is associated with the adoption of health information system (HIS) in the healthcare sector. It has been established from the study of Phichitchaisopa and Naenna (2013) that technological advancements have played an inevitable and indispensable role in changing the façade of the healthcare sector. Healthcare technology has become one of the most significant equipment in clinics and hospitals, as these innovative tools result in improving the overall performance and quality of health services or treatments. Technological and automated tools allow the healthcare professionals or doctors to perform diagnosis and treatment of the patients, in a more efficient and cost-effective manner. In particular, the advent of the concept of e-health has commendably assisted the health professionals in enhancing the quality and efficacy of care services (Nuq and Aubert, 2013). For the sake of establishing more cohesive understanding, the proceeding sections incorporate the elaboration of different concepts that are related to the concept of e-health as well as the constructs of e-health as a health information system (HIS). In addition to this, the significance of deploying HIS in the healthcare sector has also been recognized by accessing and reviewing different studies and literature.

2.2 E-Health – A Concept

According to Piette et al. (2012),the difficulties in the achievement of health targets, like growing demands of the consumers and millennium development goals have exerted considerable pressure on the concerned authorities of the healthcare sector to take affirmative action.In more precise words, it can be affirmed that the changing dynamics of the world have forced the healthcare planner to adopt innovative and advanced ways of improving the healthcare outcomes while controlling the overall cost or expenditures (Nuqand Aubert, 2014). In the present era, the healthcare sector is in great need of adequately addressing the diverse needs of the population, while providing high-quality health service in the resource-poor and remote environments. The study of Piette et al. (2012) has revealed that the services, that are highly reliable and cost effective, have become the greatest needs of the world, specifically in the middle and low-income countries. In this regard, it is observed that the e-health systems have greater capabilities of letting the healthcare sector to successfully accomplish these objectives in such ways that are both sustainable and economically viable.

While examining the historical perspective of e-health, Healy (2008) had contended that the recent developments in the field of ICT had encouraged the health sector to adopt diverse applications and tools for the facilitation of the patients. During the starting years, the health applications were famous with the names of 'telemedicine' and 'health telematics', but now they are famous with the term 'e-health'. The use of network-based infrastructure and interconnected computer systems have played a pivotal role in removing all hurdles that used to be faced by the health professionals for interacting and exchanging data among the patients. E-health has fostered

increased standardization of exchange protocols amid the computer systems and enhanced data structuring and rules of data security (Nuq and Aubert, 2014). This feature has made it possible for the healthcare sector to serve their patients in a more efficient manner. While discussing the core concept of e-health, Oh et al. (2005)have contended that it is nothing more than the set of different concepts that include commerce, technology, and health. In more specific terms, e-health can be understood as the application of internet and other relevant technological tools in the healthcare sector. The aim of the e-health is to enhance and improve the overall effectiveness and efficiency of health services by facilitating the patients as well as the healthcare practitioners to feasibly collaborate with each other.

In accordance with the study of Botha, Botha, and Herselman (2014) e-health are the use of ICTs (information and communication technologies) in the health domain. The main objective of e-health is to administer or manage patient's treatment, monitoring and researching on the health conditions of the public health, etc. Khalifehsoltani and Gerami (2010) have stated that e-health can be regarded as the utilization of the EHR (electronic health records) that are supported by the internet technology. The main aim of e-health is to ensure uninterrupted and continual doctor-patient and patient-patient communication. It is significant to bring into the notice that e-health entails several different healthcare applications that include data analysis tools, electronic patient information, internet resources, administrative data, and electronic health devices. Nuq and Aubert (2013) had suggested that the term 'e-health' entails everything that applies to the collection of medicine, healthcare, electronic devices, and computing devices.

The research work of Botha, Botha, and Herselman (2014) has presented an idea that e-health includes diverse tools, techniques, and systems. These may include patient management systems; electronic medical records; electronic prescribing systems; patient records; electronic asthma and diabetes monitoring systems; electronic communication systems; laboratory information systems; and electronic patient administration technologies and tools. Khalifehsoltani and Gerami (2010) have stated that e-health is a praiseworthy effort of the industrial leaders and healthcare groups to achieve the advantages of the healthcare units as well as internet technology. E-health has remarkably benefited the health sector as well as the patients, in terms of reducing the probability of medical error, ease of accessing health related information, increased efficiency in the patient's treatment, and close and more cautious supervision of patients. Hoque, Mazmum, and Bao(2014) have contended that e-health has simplified the provision of health services because of having different information and communication technologies. These include clinical decision support systems, mobile technology, electronic health records, internet, and telemedicine.

2.3 Health Information System – HIS

The study of Wang et al. (2005) has revealed that the health sector has tried its best for the alignment of its organizational goals and information technology (IT) strategy for the sake of adequately responding to the changing dynamics of the world. A healthcare industry's initiative of adopting information systems has played a commendable role in improving the overall performance of the industry while controlling the overall cost. While supporting the use of HIS, Moore et al. (2014) had stated that state-of-the-art and advanced HIS have great significance in bringing more improvements in the overall efficiency and quality of the health service. It is due to the fact that the health services are solely based on the availability of data for making decisions, regarding the treatment and diagnosis of the patients. In this account, HIS simplifies the process of collecting the data and processing it into useful and valuable information, while adhering to the confidentiality and integrity of patient's information (Moore et al., 2014).

It has been documented in the study of Al-Hadban (2016) that in the contemporary era the implementation of HIS has become one of the greatest necessities and priorities of the healthcare institutions. While describing the concept of HIS, Al-Hadban (2016) has stated that it is nothing more than the set of software and hardware systems that are primarily used for the retrieval, storage, communication, and utilisation of the data relevant to the health conditions of the patients. Bhattacherjee et al. (2006) have highlighted an interesting aspect about the application of HIS in the healthcare sector. In accordance with the views of the researchers, HIS is not a single entity, but it includes extensive systems that are currently operating within the healthcare sector. In particular, these systems can be

characterised into different divisions. These may include strategic, administrative, and clinical. HIS differently operate in these divisions and differently facilitate the entities working in these divisions, like providing better administrative controls, efficient and well-timed data accessibility, low cost, etc. In this account, the research work of Buntin et al. (2011) has shown that strategic, administrative, and clinical divisions of HIS have a different purpose, but they provide a comprehensive set of services and functions. Some of the most prominent functions include better administrative functions, improved and feasible accessibility to patient information, minimal medical errors, and reduced operational costs.

Bhattacherjee et al. (2006) supported the idea of Buntin et al. (2011) by claiming that HIS plays an undeniable role in reducing healthcare costs, improving staff productivity, and minimising medical errors. Furthermore, Bhattacherjee et al. (2006) had also highlighted some of the commonly used HIS that include electronic prescriptions, EMR (Electronic Medical Records), and CPOE (Computerised Physician Order Entry Systems). Muema (2014) had also conducted a research on HIS and had evaluated that the core components of this efficient technological tool include a collection of organizational rules and resources related to the healthcare information systems. These features play a central role in the process of organizational decision making for the sake of improving the overall health conditions of the patients. Yazdi-Feyzabadi, Emami, and Mehrolhassani (2015) have stated that for ensuring more efficient utilisation of the human and financial resource investments, the public health institutions are intended to be engaged in the evidence-informed decision-making. Such decision makingactivities are mainly dependent on the well-timed availability of the accurate and sound information and data.

It is significant to bring into the notice that the information is not only needed by the health policy makers for making a decision, but it is also required by the front-line health providers for the sake of improving efficiency and quality of the health initiatives. The research of Yazdi-Feyzabadi, Emami, and Mehrolhassani (2015) has established that all of these features are provided by HIS. AbouZahr and Boerma (2005) have claimed that the main purpose of using HIS is to transfer, retrieve, store, process, and collect the required information. Primarily the aim of HIS is to enhance the data handling procedures for the sake of making full use of available information; thereby, using it for resource allocation, decision-making, and health planning procedures to provide high quality health services to the patients. Balgrosky (2014) has stated that HIS has become an internationally recognised technology and a number of countries are enthusiastically adopting different types of HISs, primarily EHRs. In particular, more than ninety per cent of the general healthcare practitioners in the United Kingdom, the Netherlands, New Zealand, and Australia have reported to use EHRs. Apart from this, only ten to thirty per cent of the healthcare practitioners in the ambulatory settings in the Canada and the United States have reported to use EHRs; thereby, representing that HIS has become the greatest priority of healthcare organizations, all across the world.

2.4 Types of Health Information Systems

Cordos et al. (2010) had claimed that the standardisation of data transfer protocols and information systems have become one of an essential elements of today's healthcare sector. It is due to the fact that the innovative, advanced, and efficient HISs helps the healthcare practitioners to deliver well-timed, reliable, and efficient healthcare services. Globally, diverse HISs is being used by the healthcare practitioners. In this regard, the study of Almunawar and Anshari (2012) has revealed that EMR is the widely adopted health information system. EMR can be referred as the medical record that is usually in the digital format. However, EHR is another extensively used HIS that possess the medical record of the individual patient, in a digital format. It is also observed that EHR system has greater efficacy in retrieving and storing the individual records by the help of computer systems and networks. Besides, EHR and EMR, EPR (Electronic Patient Record) has emerged as the most competent and resourceful health information system. It has been documented in the research of Cordos et al. (2010) that EPR is nothing more than the health information system that supports storing the information of the patients regarding their treatment history, diseases, health conditions, etc. Basically, the technology of EPR incorporates diverse actions that include the manipulation, transmission, retrieval, storing, and capturing of patient's data; therefore, providing high-quality healthcare services.

The study of Balaraman and Kosalram (2013) has revealed that hospital information systems have also been adopted by the healthcare professionals to ensure providing excellent quality healthcare services to the patients. Hospital information systems can be understood as an integrated information system that is responsible for enhancing

patient care by increasing the overall knowledge of the users and minimizing the levels of uncertainty; hence, allowing the doctors and healthcare professionals to make rational decisions. Balaraman and Kosalram (2013) have further claimed that these efficient health information systems possess multiple software that is integrated for storing related information to manage day-to-day operations and medical services of the hospital or healthcare institution. Another application of HIS includes nursing information systems. Toromanovic, Hasanovic, and Masic (2010) had suggested that nursing information systems are mainly focused on providing required information to the nurses, regarding patient's conditions. Nurses have the responsibility of quickly responding to the patients' needs and have to make quick decisions; thereby, they require having an efficient access to patients' information. In this regard, nursing information systems is found to be an adequate option, as these systems are capable enough to spontaneously respond to the information needs of the nurses. Some of the other health information system includes clinical information systems; computer based patient record system, and pharmacy information system.

2.5 Significance of Deploying HIS across the Healthcare Sector

Shekelle, Morton, and Keeler (2006) have established that the deployment of HIS would greatly contribute to enhancing the performance of the healthcare sector. The efficient and timely availability of patients' data and other related information makes it more feasible for the healthcare providers and doctors to make fruitful decisions associated with patient care. Shekelle, Morton, and Keeler have further claimed that health information systems have enhanced the capability of the healthcare providers to efficiently address the care needs of the patients due to the availability of decision

support tools and information management tools. It is anticipated that the widespread adoption of HIS would enhance the overall functionality of the health sector by making the data available to the health providers. While highlighting the significance of implementing HIS in the health sector, Almunawar and Anshari (2012) had suggested that this efficient technological tool plays a remarkable role in managing and improving the relationship amid the patients and healthcare providers; therefore, leading the patients to open discuss their health issues with the healthcare providers and letting the doctors to appropriately address the care needs of the patients. It has been established by Almunawar and Anshari (2012) that the fostering strong and open relation with the patients would also help the healthcare institutions in attracting and retaining them; hence, resulting in making them loyal customers, ensuring higher levels of customer (patient) satisfaction, trust on the healthcare practitioner, and the creation of mutual understanding amid patients and doctors.

Cilliers and Flowerday (2013) have presented an idea that the deployment of health information systems in the healthcare sector is one of the most opportune solutions for alleviating the disparities that are currently impacting the overall well-being of the patients. People, in the different regions of the world, are suffering from poor health conditions due to the unavailability of appropriate healthcare facilities. Even in the current technological era, people are unable to access well-timed and cost effective healthcare services. Some people are living in the remote areas and cannot afford the expenses of travelling or visiting doctors, frequently. In such severe situations, the adoption of health information systems can be considered as the ray of hope for the poor and vulnerable patients. Cilliers and Flowerday (2013) has established that health information systems offer a number of tools and proficient

technologies that foster communicating, processing, storing, and capturing information to the relevant decision makers while allowing the doctors and healthcare professionals to coordinate with each other to make an effective decision regarding patient care. In this regard, Agarwal et al. (2011) had acknowledged the significance of implementing health information systems in the healthcare sector by stating that these state-of-the-art systems improve the overall quality of care, while appreciably minimizing the cost that is required for providing healthcare services to the patients.

The recent report of Herrick, Gorman, and Goodman (2010) published by national Centre for policy analysis has represented diverse aspects that are enough to show the significance of HIS in the health sector. In accordance with the report, the deployment of innovative and advanced HIS must be considered as the biggest relief for the healthcare sector. In accordance with the research work of Cilliers and Flowerday (2013), higher levels of ease and convenience, increased efficiency, and improved quality are the most prominent and valuable outcomes that are related to the adoption of HIS. It has been documented in the report of Herrick, Gorman, and Goodman (2010) that HIS allows the healthcare facilitators to track, access, and share patient's information with other practitioners, stored in computer systems, with ease and convenience; hence, providing timely care services.

2.6 UTAUT Model and Technology Acceptance

UTAUT is the abbreviation of the Unified Theory of Acceptance and Use of Technology. It was formulated by Venkatesh, V., et al., (2003). It is the combination of eight models. The model has great significance in the study of acceptance and use of technology. It has been widely applied in the studies of e-library, e-government, e-learning and other applications of the adoption of information systems. The model consists of four major dimensions. Each dimension refers to the attitude of the participant to adopt the system according to it. Performance Expectancy (PE), it refers to the degree of usability and performance that is expected by the individual. Effort Expectancy (EE) is the expected effort needed in time, physical effort and mental effort, according to the ease of the new system. (FC) Facilitating Conditions refer to the facilities provided by the adoption of the new system. Facilities may be in guiding manuals, learning courses or extra salary. Social Influence (SI) means the amount of how participant expects important others believe he or she use the new system. The above mentioned constructs play the role of independent variables that construct the dependent variables (BI) which it is the behaviour intention and (UB) which refers to user behaviour.

The study of Al-Hadban, (2016) has focused, exploring the condition of Iraq's public healthcare sector with respect to the adoption of HIS. It has been contended that regardless of recognising the importance of HIS across the healthcare sector, the Iraqi hospitals represent notably lower acceptance of HIS. Accordingly, the study has employed the UTAUT model for its effectiveness towards assessing the acceptance of information systems. The study has integrated the additional variables of other technological and certain individual factors as well, which has enhanced the

25

credibility of UTAUT in presenting cohesive research outcomes. It has been established that the adoption behaviour of staff towards HIS greatly depends on personal innovativeness, along with their expectations in terms of relevant trainings and influential trainers as well. As a result, the generalizability of UTAUT pertaining to the assessment of acceptance of technology is affirmed, particularly across the healthcare sector of Iraq. Likewise, the significance of UTAUT is also supported by the study of Kohnke, Cole, and Bush, (2014). It has also yielded effective outcomes with respect to assessing the acceptance of telemedicine programs across Henry Ford e-Home Health Care.

The study of Venkatesh, Sykes, and Zhang, (2011) has also employed the model of UTAUT for examining the adoption and use of Electronic medical record (EMR) systems among the doctors of a hospital. Based on the results of this longitudinal study, the researchers have contended that the moderators of gender, experience, and voluntary use are not considerable effective, while the moderator of age counts more for predicting the technology adoption or use. Consequently, the study has contributed to emphasising the implications of UTAUT across the IT sector of healthcare. It has also been established from the study of Ami-Narh, and Williams, (2012), that the increasing advancements across ICT have also increased the research trends of assessing its acceptance across the targeted domains. Accordingly, the success of technology acceptance is greatly challenging across developing states, like Africa, since the technological awareness of such states is considerably lesser than the desired level. The research findings affirm the implications of UTAUT in terms of assessing the acceptance of technology even across such states.

The study of Kijsanayotin, Pannarunothai, and Speedie, (2009) has assessed the acceptance of national universal healthcare program across the healthcare sector of Thailand. In this regard, the researcher has recognized the significant contribution of UTAUT model in determining the most influential factors with respect to the identifying the acceptance of IT integration. The study has carried out a cross-sectional survey based on the constructs of UTAUT model, which has facilitated generalizing its implications. It has been noted that the moderator of voluntariness in collaboration with the factors of effort expectancy, performance expectancy, and social influence is effective in determining the acceptance of IT. Accordingly, the model of UTAUT is affirmed to be proficient in developing the healthcare sector of a nation. In addition to this, Ifinedo, (2012) has also studied the benefits of IT across the healthcare sector. For this purpose, the research has focused the healthcare sector of Canada, being a developed state. Observing the results, it has been noted that the impacts of performance expectancy are notable less significant, while the UTAUT constructs of effort expectancy, social influence, compatibility, and organizational facilitating conditions are significantly influential over the acceptance of IT across the healthcare sector.

2.7 Opportunities and Challenges of HIS Adoption across the Private Healthcare Sector in Iraq

It has been stated by AbdGhani and Neamah (2016), during the period of the 1970s and 1980s; the medical education and healthcare sector of Iraq were considered to be the best in the entire region. However, the Iraq-Iran war had posed devastating impacts on the entire country; thereby, led it towards fragile healthcare infrastructure, inadequate supply of drug or medicines, and non-functioning of the healthcare equipment. It is a fact that the government later spent huge capitals on the rebuilding of health infrastructure, but due to increased corruption and lack of adequate management, the healthcare sector could not revive. AbdGhani and Neamah (2016) had restated the findings of the recent WHO (World Health Organization) report that shows that a large number of Iraqi people have to encounter severe consequence, and even death, due to medical errors and poor healthcare facilities. Apart from the loss of precious human lives, the ministry of health and healthcare institutions also have to suffer from financial losses due to medical errors. In such circumstances, it is expected that the deployment of HIS would significantly help the healthcare organizations in eliminating the unnecessary costs, increasing the overall efficiency of the healthcare sector, reducing the medication errors, and improving the overall outcomes (AbdGhani and Neamah, 2016). However, it is also observed that there are several barriers that could hinder the adoption of HIS across the private healthcare sector in Iraq. The proceeding sections incorporate the analysis of the opportunities and challenges of HIS adoption across the Iraqi healthcare sector.

According to AbdGhani and Neamah (2016), one of the biggest challenges that could be encountered by the private healthcare sector of Iraq during the adoption of HIS

includes the financial challenges. The implementation of health information systems requires high cost that is beyond the affordability of the concerned authorities of the Iraqi private healthcare sector. It has been established that the capital that is required for the deployment of the electronic health record is approximate $77, 000 per bed. This huge amount is highly expensive and beyond the affordability of the medical centers and private hospitals of Iraq. It has become one of the greatest concerns for MOH (Ministry of Health) of the Iraq to implement the information systems in the healthcare system (AbdGhani and Neamah, 2016). Apart from the cost of the system, it is also observed that the country has insufficient infrastructure, including IT specialists, software, hardware, support and maintenance, and support of stakeholders. All of these factors are collectively responsible for creating hurdles in the adoption of health information systems in the private healthcare sector of Iraq.

In accordance with the research work of Ghani and Jaber (2015), another big challenge that could be encountered by the private healthcare sectors of Iraq during the adoption of HIS includes technological challenges. It has been assessed that the hospitals and healthcare centers in Iraq primarily lack the technological infrastructure. The high rate and rapid changes in the technological sector are threatening the Iraqi healthcare industry, in terms of adopting any innovation. It is expected that the deployment of HIS would hinder the capability of the healthcare sector to handle the issues that are often occurring during the operations of information systems (AbdGhani and Neamah, 2016). It is due to the fact that Iraq is also lacking in the technical expertise and skills. Some of the other challenges that could be occurred in the adoption of HIS in Iraq include cultural barriers, human barriers, terrorism attacks, and lack of expertise.

On the contrary, the deployment of HIS would open a new door of innovation and advancement for the Iraqi healthcare sector. Ngafeeson (2015) had suggested that a health information system offers extensive benefits to the doctors, ministry of health, as well as to the patients. Some of the most prominent opportunities that are associated with HIS include improved service quality, minimized operational cost, reduced medical errors, as well as increased legibility. It has been documented in the research study of Ghani and Jaber (2015) that the implementation of health information system brings higher levels of cost effectiveness and efficiencies in providing health services to the patients; hence, enhancing the overall credibility of health services and the reliance of the citizens over the sector. In the reflection of this information, it is anticipated that the adoption of HIS would be opportune for the private healthcare institutions of Iraq. In more precise words, the opportunities associated with HIS deployment in Iraq include improved quality of health services, minimized the risk of errors, well-timed availability of services, higher customer (patients) satisfaction, and saving of cost.

2.8 Chapter Summary

The chapter entails the review of the diverse literature regarding the aspects relevant to health information and its deployment in the private healthcare sector of Iraq. Different reliable and authentic sources and databases were accessed for the sake of gaining insightful and profound knowledge about the topic. The chapter has incorporated the concise yet profound analysis of studies that were associated with the concept of e-health and its importance in the healthcare sector. In addition to this, the chapter has also explained the health information systems and their role in providing high quality health services. Moreover, the types of the health information systems have also been provided in the chapter to signify their operations in providing effective healthcare services to the patient. Lastly, the significance of deploying HIS and the opportunities and challenges of HIS deployment in the Iraqi private healthcare sector has also been discussed in the literature review chapter.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter of the thesis thoroughly comprises of the description of the adopted framework of research methods. The dedicated section of the adopted research method reflects the undeniable importance of selecting the most appropriate methodology; thus, becoming the most important element of a successful study. Felizer (2010) has documented that the methods of collecting and analyzing data are of utmost importance, since the study aims at yielding credible and sound results (Flick, 2015; Jackson, 2015). Besides, Bryman (2015) has also affirmed the importance of research method in the accomplishment of research objectives. The current study being focused on the assessment of the real situation of HIS adoption across the private healthcare sector of Iraq, has potentially adopted the data collection method of directly approaching the research participants. In this regard, a survey questionnaire has been conducted that was designed based on the identified constructs of UTAUT model. Accordingly, the essentials of the entire research plan are described in the underpinned section of this chapter..

3.2 Research Approach

According to the study of Fowler Jr, (2013) researcher needs to identify the research approach first, since it facilitates the demanded feasibility within the research plan that is critical to the categorization of the selection of the most appropriate methods of collecting and analyzing the data. Accordingly, Lewis (2015) has contended that the selection of research approach is carried out right at the time of formulating the objectives of the study. It has been asserted based on the fact that the objectives are intended to be accomplished based on the selected approach, in order to ensure the integrity of the entire research plan. Based on this recognized significance of research approach, three types of research approach have been devised, as Quantitative, Qualitative, and Mixed Research (Taylor Bogdan and DeVault, 2015; Creswell, 2013; Zohrabi, 2013; Silverman, 2013). All three approaches are characterized based on their respective efficacies towards the success of the study. If the research is qualitative in nature, the study entails the benefit of flexibility and accessibility with respect to the collection of data (Bryman, 2015).

Among the potential data sources, relevant literature, interviews, and participants' observations are the eminent ones, which eventually lack in directly accessing the information source. However, using credible online databases adds the element of integrity to the qualitative studies (Bryman and Bell, 2015). On the other side, the potential lacking of qualitative studies in terms of direct access to the data sources is mitigated by the selection of the quantitative approach (Burns and Burns 2008; Bryman and Bell, 2015). Consequently, it has been established that the appropriateness of the selected research approach is affirmed in relation to the study context. The current study has adopted quantitative research approach, based on the

intended aim of collecting primary data with respect to the objectives of assessing the HIS adoption across the private healthcare domain of Iraq. However, the constituents of primary data collection have been backed by the insights acquired from the relevant literature. Therefore, the research represents a considerable stance in terms of having integrity.

3.3 Research Purpose

The selection of research approach leads to the decision making stage of research purpose. According to the study of Davies and Hughes (2014), the purpose of the research is eventually aligned with its objectives, since the nature of the study could vary in between the veracity of being a new research scope or an extension of previously conducted study. Therefore, it is critically significant to have a clearly identified research purpose, in order to ensure the directed accomplishment of the study (Jackson, 2015). Research purpose has been described in three aspects of being *Exploratory, Descriptive, and Explanatory* (Gray 2013; Denscombe 2014). If a study is exploratory in nature, it represents that the problem focus has not been explored previously; thus, requiring investigation. On the other hand, if a research is noted to be *Descriptive* in nature, it gives the impression that it is the extension of previously conducted *exploratory* research. Accordingly, the study outcomes are further explored with the added element of the massive amount of data collected in this regard. Consequently, the *descriptive* study yields the identified variables, which are eventually explored in terms of interrelationship by the adoption of *Explanatory* purpose of the research (Collis and Hussey 2013).

The current study has employed *explanatory* purpose of the research, in terms of assessing the Iraqi healthcare sector's adoption of HIS based on the identified constructs of UTAUT model. As a result, the study is going to mitigate the notable gap in the literature with respect to focused outcomes towards the Iraqi healthcare domain.

3.4 Research Design

Research design is the strategic representation of the entire research process that affirms the efficient and systematic execution of the entire research. The completion of the research needs to have the assurance of timeliness, cost-effectiveness, feasibility, and integrity at all the levels (Mitchell and Jolly 2012; Zikmund et al., 2012). It turns out to be the selection of specific collections and analysis methods of the relevant data. Among the mostly adopted research designs, review-based, experimental, semi-experimental, descriptive, and correlation designs are the eminent ones (Bryman and Bell, 2015; Franck 2013; Mitchell, & Jolley, 2012; Jackson 2015; Bernard, 2011; Trotter, 2012)

The researcher in this particular study has adopted the design of the review-based, descriptive and correlation; thus, facilitating the accomplishment of the study objectives. Initially, the collection of data has undergone review-based aspects that have led the researcher to the insightful understanding of the study context and the problem focus. Afterwards, it has been the descriptive design in the form of questionnaire survey that resulted in the collection of the most relevant and credible primary data to be analyzed. Finally, correlational design has then facilitates the

comprehensive establishment of the relationship in between the identified variables of UTAUT towards the study objectives.

3.5 Research Questions

The study has also formulated the research questions, in relation to the accomplishment of study's aim. The section below presents the research questions that have been answered by the adopted research approach:

Q1. What are the potential challenges of HIS adoption across the private healthcare sector in Iraq?

Q2. How the model of UTAUT is effective in determining the acceptance or use of technology across the Iraqi private healthcare sector?

Q3. Which of the constructs of UTAUT model are more influential towards the acceptance of HIS across the private healthcare sector in Iraq?

3.6 Data Sources

Once the researcher has made proficient decisions pertaining to the research approach, purpose and design of the study, it leads to being considerate towards the selection of data sources. The data sources are required to be accessible, but credible, sound, authentic, and preferably the most recent as well. It has been contended, based on the established implications of data sources towards the cohesiveness and coherence of the study outcomes (Davies and Hughes 2014; Denscombe 2014). The data sources are either primary or secondary, and the researcher has to adopt the most relevant ones, based on the selected approach to the study. Primary sources serve as the direct sources of data collection, while the secondary sources are the indirect

sources. However, the researcher needs to be cautious with both the sources of data, as there are the prospects of manipulation or authenticated with both the sources of data (Denscombe 2014; Davies and Hughes 2014)

The outcomes of this particular study are primarily based on the primary data source of the survey questionnaire. However, the implications of secondary sources of data are also aligned with the success of the study. The designing of the questionnaire instilled the impacts of the insights that were acquired from the comprehensive investigation of the findings of relevant literature. The literature was accessed from the credible online databases of Google Scholar, EBSCOhost, ProQuest, ScienceDirect, and others as well. The search results were further refined by the use of Boolean operators (AND/OR), while retrieving peer-reviewed articles. As a result, the researcher has acquired a credible amount of secondary data in a timely and efficient manner. Afterwards, the survey for collecting primary data was formulated to be distributed across the 250 sampled participants across the private healthcare sector of Iraq. Consequently, the researcher has ensured the collection of credible and sound information, fulfilling the demanded integrity of the research area, which is in accordance with the study outcomes of Crano et al., (2014).

3.7 Population of the Study

The credibility of the study outcomes also entails the impacts of research population that is contended to be having similar interests or identical in expertise regarding the research area. (Weiss and Weiss 2012). Based on the recognition of this particular aspect of the study population, the researcher in this particular study has been considerate in this regard. Since the research is intended to assess the HIS adoption across the private healthcare sectors of Iraq, the participants have been carefully targeted across the accessible private healthcare institutions in Iraq. Moreover, the considerations of computer and internet knowledge have also been regarded while dealing with the competence of the administrative staff.

3.8 Sampling Strategy

The study outcomes are mainly reliant on the primary collection of data that incorporates the essential aspect of sampling the targeted population. Sampling is basically the division of the entire population into small segments, having the characterized aspects of identical interests. The importance of sampling is affirmed from the perspective that the entire population cannot be approached for the collection of data, based on certain limitations or constraints of time, cost, and accessibility. Therefore, sampling needs to be the most efficient pertaining to the accomplishment of the study objectives in the most credible manner (Cooper *et al.* 2003).

Besides, the study of Mendenhall et al. (2012) has highlighted another essential element of the sampling process, which contends that the sampling needs to be free from the impacts of biases among the selected participants. It has been asserted based

on the fact that the biased responses would eventually affect the credibility and integrity of the study outcomes; thus, devastating the entire sampling efforts, if avoided. Therefore, the sampling needs to be representative in its real sense, since it turns out to ascertain the most needed element of unbiased responses. Accordingly, the researcher has the option of selecting either probability or non-probability sampling technique. Both the techniques have respective effectiveness on the collection of data; however, probability technique tends to demand increasing levels of skills to select the most appropriate participants. Therefore, the researcher has selected non-probability sampling technique due to its random nature of selecting the participants for the collection of data. Consequently, doctors, administrative staff, and the IT specialists have been sampled for this particular study of assessing the HIS adoption across the Iraqi healthcare sector.

3.9 Sample size

This particular element of the research plan is of critical significance, as the sample size tends to govern the generalizability of the study outcomes across the research area. If the sample size is not appropriately selected, it eventually becomes a limitation of the study. Therefore, the researcher has sampled 250 participants across the private healthcare sector of Iraq.

3.10 Statistical Technique

After the collection of the relevant data based on all the considerable aspects of ensuring credibility, there comes the stage of analyzing the findings. It has been acknowledged from the study of Franck (2013) that the use of statistical techniques has greater significance in acquiring reliance and pertinence in the research findings. Based on this particular insight of data analysis, the researcher has ascertained adopting the most optimal approach towards establishing credible results. Accordingly, the findings acquired through the questionnaire have been analyzed through descriptive statistics (frequency and percentages). It has led to making the researcher capable of forecasting the potential outcomes based on the identified patterns from the data. Afterwards, the researcher is left to analyze the relationship in between the identified constructs of the UTAUT model, pertaining to the anticipated outcomes of the study. In this regard, the researcher has employed the techniques of Factor Analysis, correlation, and regression analysis.

Factor Analysis: It leads to grouping the findings based on similarities, in terms of identifying clusters. As a result, latent variables are identified, but the prospect of being dependent or independent is not distinguished at this stage (Kline, 2014).

Correlation: It yields the strength of the relationship in between the identified variables, by means of considering the value of the correlational coefficient in this regard (ranging in between -1 to +1) (Cohen, *et al.,* 2013). If the relationship includes the prospects of only correlation in between the two variables, it turns out to be *simple* correlation. However, if one of the variables has association with the factor

variable, the correlation is regarded as *partial* correlation. If the value of he coefficient of correlation is greater than 0.75, the degree of correlation is regarded as *high*. Likewise, the value in between the range of 050-0.75 makes the degree of correlation to be *moderate*, and for the values in between 0.25-0.50, the degree is *low*. Besides, no correlation exists, if the value is lower than 0.25 (Cohen, et al., 2013).

Regression: It is used for predicting the likely impacts of the identified relationship of the respective variables, having one dependent and many independent variables. It is distinguished from the results of correlation on the basis of its unique aspect of assuming a causal relationship in between the identified variables (Montgomery, Peck, and Vining, 2015).

3.11 Research Instrument

The employed instrument to collect the primary data has been the questionnaire survey. The questionnaire comprised of close-ended questions based on the 5-point scaling (Disagree-Agree). The participants were inquired in terms of their demographic details of age group, gender, education level, IT expertise, and the respective constructs of the UTAUT model towards the likely adoption of HIS.

3.12 Variable Description

The constructs of the UTAUT model have been regarded as the identified variables of the study. On the basis of these constructs, identified as dependent and independent variables (Table 2), the study has credibly drawn the results regarding

the acceptance of HIS across the private healthcare sector of Iraq. The acceptance and use of HIS across the healthcare sector of Iraq is determined on the basis of the behaviour of users along with the behavioral intention of the users; thereby, regarding these moderators as the dependent variables of the study. On the other hand, it has also been recognized that these moderators are directed by certain other moderators of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC); thus, termed as the independent variables of the study.

Table 2: Variables of UTAUT Model

Independent Variables	Dependent Variables
• Performance Expectancy (PE), • Effort Expectancy (EE), • Social Influence (SI), and • Facilitating Conditions (FC)	• Use Behaviour - UB • Behavioural Intention - BI

3.13 Ethical Consideration

The involvement of human participation entails the need of ensuring the ethical aspects of the study, if the integrity of the research is intended to be maintained. Based on this particular prospect, the researcher has ensured the right-to-information and the right-to-privacy of the research participants, by means of providing all the relevant details within the consent of participation at the time of conducting survey. Besides, none of the responses were manipulated or forged to acquire the anticipated research outcomes.>

3.14 Methodological Summary

Below is the summarized illustration of the entire research plan:

Table 3: Summarized Research Plan

Research Approach	Quantitative Approach
Research Purpose	Explanatory Research
Research Design	Review-based (Literature Review), Descriptive (Questionnaire Survey), and Correlational Design
Data Source	Primary and Secondary
Population of the Study	Private healthcare sector of Iraq (doctors, IT specialists, and other administrative staff)
Sampling Strategy	Convenience
Sample size	204
Research Instrument	Questionnaire Survey
Statistical Analysis	Descriptive, Factor Analysis, Correlational and Regression analysis

CHAPTER 4

FINDINGS & ANALYSIS

4.1 Introduction

This section presents the findings gathered through the survey questionnaire, in relation to the accomplishment of the study objectives. The survey was conducted across the targeted 250 participants from the private healthcare sector of Iraq. In order to collect the data, the researcher has uploaded the designed survey on Google Docs, followed by posting the link across the online platforms of (client needs to inform); thus, making it accessible to the sampled participants of the study. However, 204 responses have been used, based on completeness and credibility. At first, the descriptive statistics are underpinned for the demographic details of the participants, as these details facilitate generalizing the study outcomes. Afterwards, factor analysis, correlation, and regression of the identified dependent and independent variables have been analyzed.

4.2 Descriptive Statistics

It was anticipated that the survey participants would involve both females and males, since the adoption of HIS was aimed to be assessed across the entire private healthcare sector of Iraq. Besides, biases or conventional notions of gender discrimination were also intended to be mitigated from the responses. Therefore, the Table below (Table 4) represents the successful attempt of the researcher in getting

significant contribution of both the females and males of the target sector. Figure 2 reflects that the proportion of both the genders has been almost equal, as 51 percent males and 49 percent females have contributed to the study.

Table 4: Gender of the Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender					
Valid	Male	104	51.0	51.0	51.0
	Female	100	49.0	49.0	100.0
	Total	204	100.0	100.0	2.1
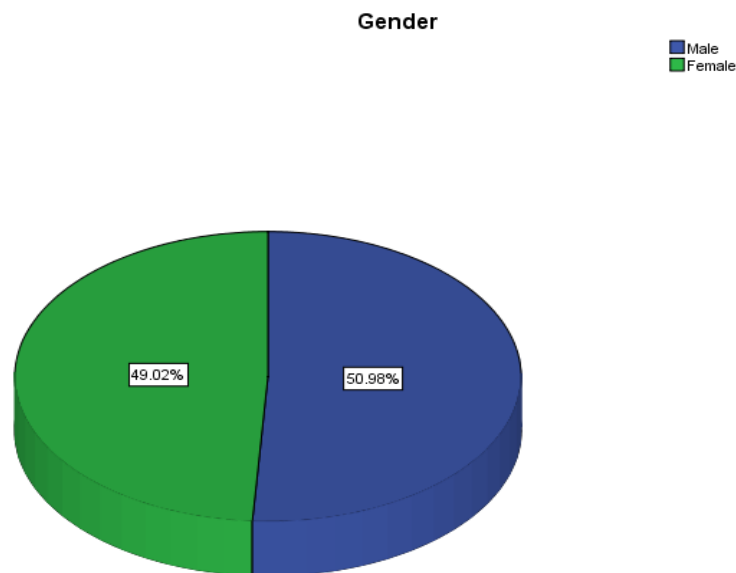
Figure 2: Gender of the Survey Participants

Another component of demographic inquiry is the age group. The research has anticipated knowing the potential users of the HIS in terms of the age group, since it tends to represent the population's acceptance in a generalized manner. Accordingly, the survey responses reflect that majority of the potential users belonged to young

adults; thus, presenting significant chances of HIS adoption over the upcoming years

(Table 5).

Table 5: Age Group of the Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Age Group					
Valid	Under 20	4	2.0	2.0	2.0
	20-30	65	31.9	31.9	33.8
	31-40	93	45.6	45.6	79.4
	40 above	42	20.6	20.6	100.0
	Total	204	100.0	100.0	2.2
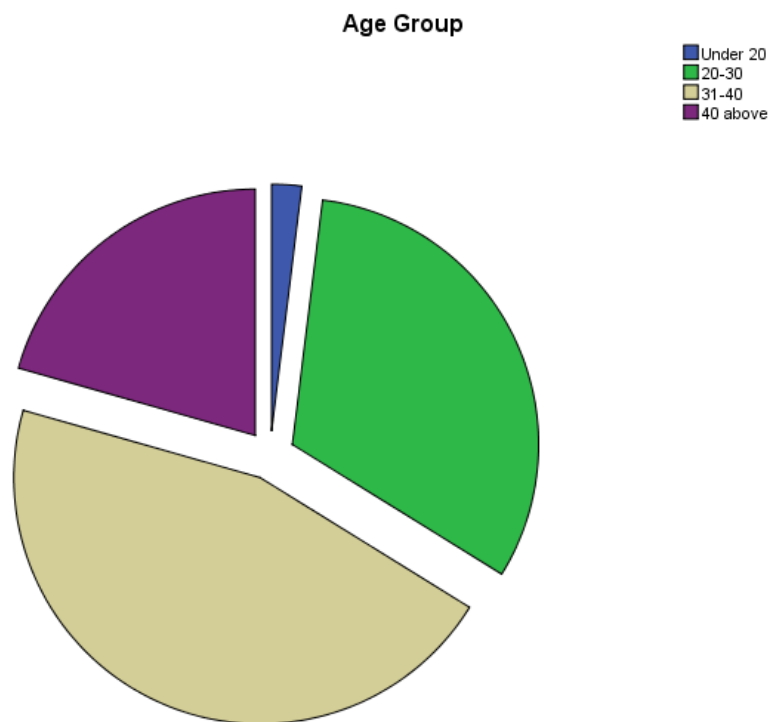
Figure 3: Age Group of the Survey Participants

In addition to the gender and age group of the survey participants, education level and employment position of the participants were also inquired as the demographic factors. It has been based on the fact that the level of acceptance of HIS would be determined to a considerable credible level. Consequently, the responses represented that most of the users of the HIS technology would be having diploma and postgraduate degrees (Table 6). It leads to the assertion that the potential users of HIS would be willing and responsive towards the implications of technology, as the level of education is convincing. Likewise, the employment position of the participants has added value to the generalization of the results, since the adoption of the HIS technology greatly depends on the organizational status of the users. Therefore, (Table 7) has presented the findings that the adoption of HIS is going to rely on the technology acceptance by the doctors and the administrative staff of the private healthcare sector of Iraq.

Table 6: Education Level of the Survey Participants

Education Level					
		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	High school or below	28	13.7	13.7	13.7
	Diploma	78	38.2	38.2	52.0
	First Degree	40	19.6	19.6	71.6
	Postgraduate degree or above	58	28.4	28.4	100.0
	Total	204	100.0	100.0	2.3

Table 7: Employment Position of the Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Position					
Valid	Doctor	94	46.1	46.1	46.1
	Administrative Staff	74	36.3	36.3	82.4
	IT Specialist	36	17.6	17.6	100.0
	Total	204	100.0	100.0	2.4

HIS being the IT-integration across the healthcare sector, demands its potential users to have significant knowledge of computer and internet, if its increased adoption is expected. Since, the researcher has targeted the healthcare domain in Iraq for the study objectives, and Iraq has been under the influence of war and certain other government related corruption events for a long period. Therefore, its technology awareness needed to be inquired. In this regard, the researcher has collected basic data about the computer and internet knowledge or level of acceptance of the potential users of HIS. (Table 8) and (Table 9) represent the relevant statistics that reflect that computer knowledge and internet knowledge have been moderate for the majority of the participants, respectively. A minimum of 53 out of 204 (almost 26 percent) respondents have been noted to have poor levels of computer knowledge (Table 8), while only 47 respondents (almost 23 percent) are evaluated to have poor level of internet knowledge (Table 9). As a result, it can be established that the HIS adoption across Iraqi healthcare (private) sector is convincing in relation to the advancing nature of IT across the globe.

Table 8: Computer Knowledge of the Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
How do you rate your computer knowledge?					
Valid	Very Poor	5	2.5	2.5	2.5
	Poor	48	23.5	23.5	26.0
	Moderate	78	38.2	38.2	64.2
	Good	62	30.4	30.4	94.6
	Expert Level	11	5.4	5.4	100.0
	Total	204	100.0	100.0	2.5
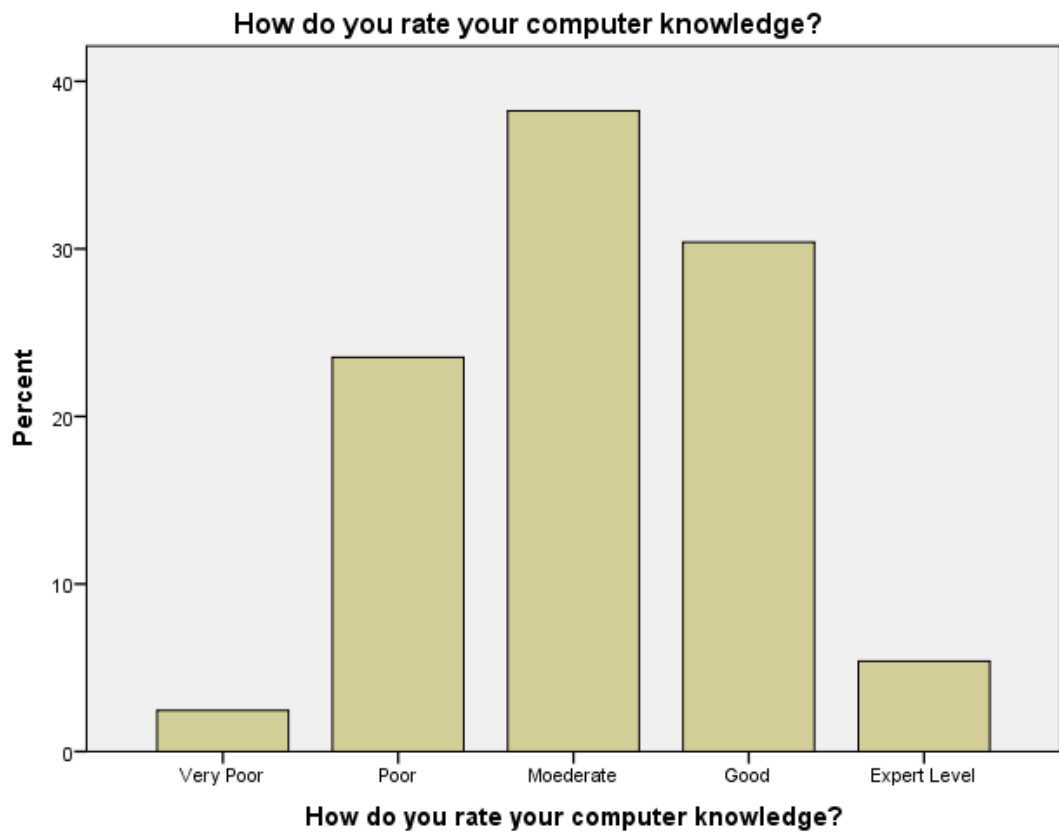
Figure 4: Computer Knowledge of the Survey Participants

Table 9: Internet Knowledge of the Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
	How do you rate your internet knowledge?				
Valid	Very Poor	3	1.5	1.5	1.5
	Poor	44	21.6	21.6	23.0
	Moderate	74	36.3	36.3	59.3
	Good	72	35.3	35.3	94.6
	Expert Level	11	5.4	5.4	100.0
	Total	204	100.0	100.0	2.6

In order to refine the findings in relation to the study objectives, the researcher has also collected data about the internet awareness of the potential users of HIS, in terms of internet usage history (Table 10), and daily hours spending over the internet (Table 11). It has been observed that the increasing penetration of the internet over the recent past years has notably influenced the users across the Iraq. Almost 61 percent (124 respondents) have adopted internet usage over the last 2 years (Table 10). It reflects that the users have a significant awareness of the internet and its implications as well.

Table 10: Internet Usage history of the Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2 year	31	15.2	15.2	15.2
	Almost a year	25	12.3	12.3	27.5
	Don't use	20	9.8	9.8	37.3
	Over 2 years	124	60.8	60.8	98.0
	Recent user (couple of months)	4	2.0	2.0	100.0
	Total	204	100.0	100.0	2.7
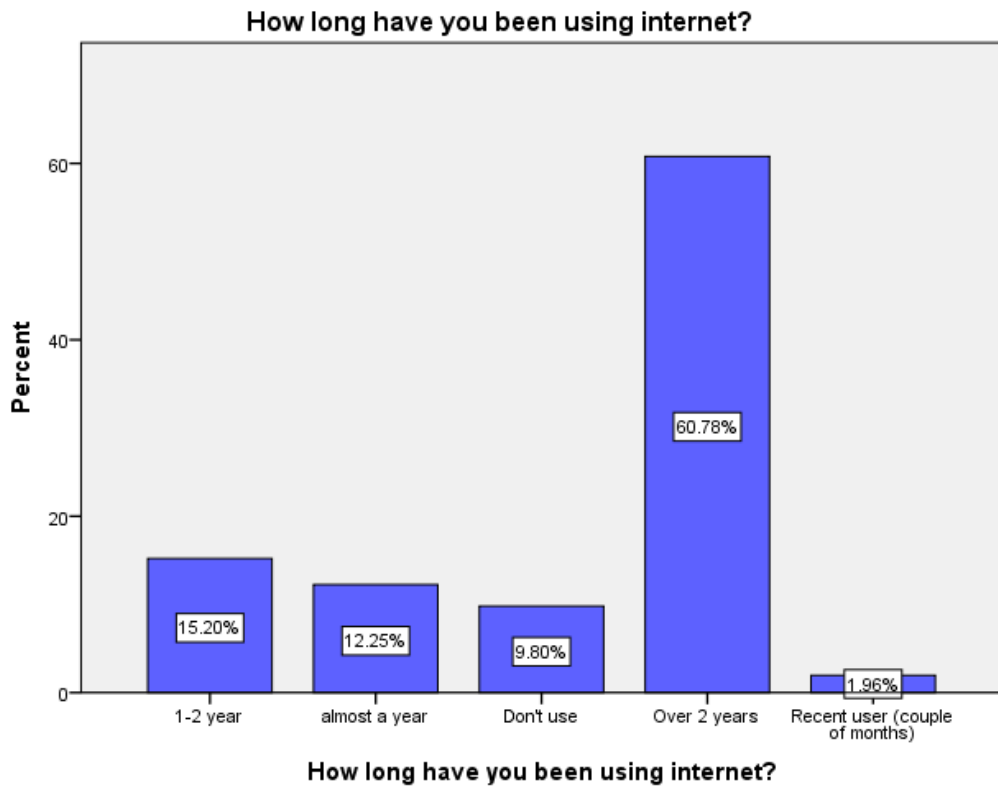
Figure 5: Internet Usage Trends of the Survey Participants

While being aware of internet technology, the daily usage of internet is also significant, as it would lead to the assertions regarding their willingness and interests in the adoption of internet technology to a greater extent. (Table 11) represents that majority of the respondents tend to use the internet for almost 1 to 2 hours on a daily basis. 26 percent of the internet users have reported spending almost 1-2 hours, while almost 28 percent have reported the usage duration of 1 hour on a daily basis (Table below). Consequently, it represents that HIS has not acquired much adoption that seems concerning to a considerable extent. The overall activities of healthcare are aimed to have technology integration that would be a success if the potential users reflect a great interest in terms of increased usage.

Table 11: Per Day Usage of Internet by the Survey Participants

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	1-2 hours	53	26.0	26.0	26.0
	4-5 hours	41	20.1	20.1	46.1
	Almost 1 hour	56	27.5	27.5	73.5
	Almost 4 hours	32	15.7	15.7	89.2
	Most of the time	22	10.8	10.8	100.0
	Total	204	100.0	100.0	2.8

4.3 Factor Analysis

As documented above, the factors of age group, gender, education level, employment position, and internet knowledge have been measured only for understanding the characteristics of participants. These factors have been excluded from the analysis, since the method of measurement of these variables does not allow statistical analysis, such as correlation and regression, with the main variables of the study. Although the main variables are measured on a 5-point scale, it is assumed that they can be used for factor analysis, and other statistical test.

Accordingly, the study leads to factor analysis that groups or summarizes the findings based on similarities, in terms of identifying clusters. As a result, latent variables are identified, but the prospect of being dependent or independent is not distinguished at this stage (Kline, 2014). Primarily, the study intends to assess the current situation of HIS adoption across the private healthcare sector of Iraq. In this regard, the researcher has successfully gathered the data regarding the demographic aspects of the survey respondents, being the potential users of HIS. After gaining insightful knowledge of the users' interest in technology, the researcher has employed UTAUT model for assessing the accurate extent of HIS adoption among the potential users across the private healthcare sector of Iraq. The model of UTAUT has been deployed based on its contribution in terms of both the behavioral responses towards technology acceptance and psychological impacts as well. The UTAUT model successfully integrates the implications of TAM (Technology Acceptance Model) in terms of behavioural aspects of technology adoption, and TRA (Theory of Reasoned Action) as well for the psychological aspects of accepting the technology integration. Accordingly, the model of UTAUT has facilitated the assessment of HIS

adoption across the private healthcare sector of Iraq, in terms of its identified dependent and independent variables.

The researcher has constructed the survey questionnaire with multiple close-ended questions, using 5-point scale. The questions individually catered all the identified variables of UTAUT model, including *Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)* as the independent ones that ultimately influence the dependent variables of *Use Behaviour - UB and Behavioural Intention - BI,* in terms of determining the HIS adoption. After gaining 204 complete and credible responses out of 250 responses from the sampled participants, the researcher has performed a factor analysis over the collected data. Factor analysis has been carried out for its statistical significance of minimizing or summing up the gathered datasets into the certain specific constructs that are essential to the generation of final comments (Kline, 2014). By means of using PCA as Principal Component Analysis, the viability of factor analysis along with the implications of sampling in terms of appropriateness has been attained through the tests of KMO and Bartlett.

The Table below (Table 12) reflects that the significant value resulted by KMO and Bartlett's test is less than 0.01; thus, it is ascertained that there is a definite correlation present across the gathered data. In addition to this, the KMO value "0.872" is significantly above the minimum acceptable value of 0.6; thereby, it leads to the affirmation of adequate sampling. Consequently, the researcher is satisfied with the current standing of the study, as the sampling has been ascertained and the occurrence of correlation in between the identified variables has also been guaranteed. As a result, the credibility of factor analysis is also recognized.

Table12: Suitability of testing and appropriateness of Sampling

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.872
Bartlett's Test of Sphericity	Approx. Chi-Square	1665.789
	Df	231
	Sig.	.000

(Table 13) represents that the method of Varimax has been employed for the generation of Rotated component matrix. Rotation basically leads to a reduced number of factors that are highly influential over the identified variables; thus, making the interpretation easier to a certain extent. Consequently, the results indicate 6 identified components by means of PCA extraction. Observing the Table below, it is evident that the significant constructs of the survey are representing loading on the respective component or identified variable, while loadings with a value less than 0.5 have been suppressed to refine the results (Table 13).

For performance expectancy (PE) as the potential identified independent variable holds the impacts of all its constructs, (PE1, PE2, PE3, PE4, PE5, PE6, and PE7). Meanwhile, the level of impact is significant as the values are notable closer to 1 (Table 13). For Effort Expectancy (EE), its constructs of EE5, EE4, EE6, and EE7 have been noted to be significant, on the basis of the significant values greater than 0.5. Besides, the impacts are noted to be high to moderate for the significant values closer to 1, respectively (Table 13). For Social Influence (SI), the constructs of SI3, SI4, SI5, and SI6 are affirmed to have significance (sig. value greater than 0.5) in relation to the study objectives. Besides, the level of significance is noted to be high

to moderate based on the proximity to be 1 for the extracted constructs, respectively (Table 13).

For Facilitating Conditions (FC), two of its constructs FC1 and FC2 have been extracted as significant ones, with moderate level of significance towards the study objectives (Table 13).For Use Behaviour (UB), both the constructs UB1 and UB2 have acquired significance towards the study objectives, with a significance level of high to moderate in a respective manner (Table 11). For Behavioural Intention (BI), all its constructs (BI1, BI2, and BI3) have gained a moderate level of significance with significance values greater than 0.5 (Table 13). Consequently, factor analysis has facilitated the interpretation of the collected dataset in terms of minimizing the constructs of the survey on the basis of the most influential aspects. As a result, 32 constructs have been reduced to 22 constructs, having significant impact on the identified variables by means of using Varimax technique, since it facilitates determining what the components represent. Besides, it also instills the estimated correlation between the estimated components and the variables (Table 13).

Rotated Component Matrix[a]		Component					
		1	2	3	4	5	6
Using IT for patient care and management seems appealing	PE1	.807					
Using IT for patient care will be productive	PE2	.889					
IT seems compatible with my work	PE3	.788					
IT integration matches my working attitude	PE4	.732					
Prompt and effortless completion of tasks will be facilitated	PE5	.759					
Work Efficiency will be improved	PE6	.857					
Patient care will be improved	PE7	.820					
If it is favorable, I will use it	BI1		.732				
I will use it for clinically facilitating the patients' needs	BI2		.776				
I will adopt it for frequent usage	BI3		.753				
Using IT at work is not annoying	EE4			.704			
Its complexity does not scare me	EE5			.745			
I find it easy to use	EE6			.687			
I find the interactivity understandable	EE7			.628			
I will be needing enough support from the supervisor	SI3				.869		
I would be requiring significant encouraging attitude	SI4				.878		
I would be needing proper access to the system	SI5				.668		
I would be needing support until satisfactory performance	SI6				.584		

Contiouation of Table 13: Rotated Component Matrix

IT is already in my practice	UB1					.871	
I have experienced IT in my field	UB2					.525	
Efficient resources are there to use HIS	FC1						.588
Considerable knowledge is there to exercise HIS in patient care	FC2						.673
Extraction Method: **Principal Component Analysis.**							
Rotation Method: **Varimax with Kaiser Normalization**.							
a. Rotation converged in 9 iterations.							

4.4 Correlation Analysis

Correlation analysis yields the strength of the relationship in between the identified variables, by means of considering the value of the correlation coefficient in this regard (ranging in between -1 to +1) (Cohen, *et al.,* 2013). Once the potentially influential constructs have been deduced through factor analysis, the data have been analyzed in terms of Pearson correlation. Accordingly, a two-tailed test has been implemented for its feasibility of analyzing the variables to be both lower and higher than the average mean, rather than the one-tailed test that offers either higher or lower value for the variable under consideration. The value of two-tailed significance has been set to 0.01, which is going to decide the validity of formulating hypotheses. The Table below (Table 14) reflects that all the variables under consideration have acquired considerably positive values of statistical significance; as the level of significance has be 0.000 that is notably lower than the two-tailed significance level of 0.01.

Table 14: Pearson Correlation

Correlations		Performance Expectancy	Effort Expectancy	Social Influence	Facilitating Condition	Behavioural Intention	User Behaviour
Performance Expectancy	Pearson Correlation	1	.687**	.556**	.673**	.761**	.461**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	202	190	195	195	197	196
Effort Expectancy	Pearson Correlation	.687**	1	.597**	.672**	.654**	.567**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	190	190	186	183	185	188
Social Influence	Pearson Correlation	.556**	.597**	1	.651**	.633**	.503**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	195	186	195	191	194	191
Facilitating Condition	Pearson Correlation	.673**	.672**	.651**	1	.754**	.547**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	195	183	191	196	195	192

Behavioural Intention	Pearson Correlation	.761**	.654**	.633**	.754**	1	.613**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	197	185	194	195	198	194
User Behaviour	Pearson Correlation	.461**	.567**	.503**	.547**	.613**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	196	188	191	192	194	197
**. Correlation is significant at the 0.01 level (2-tailed).							

Besides (Table 14) also highlights the statistical significance in between the identified variables, as these variables tend to determine the potential acceptance and use of HIS across the Iraqi private healthcare sector. It is noted that the correlation in between the dependent variable of BI is positive with all the independent moderators of PE, EE, and SI, having a high degree of association (coefficient (r) values of 0.761, 0.654, and 0.633), respectively. In addition to this, the other dependent variable of UB has acquired positive statistical significance with respect to its influential moderators of FC, and BI, with degree of association to be medium (coefficient (r) values of 0.547) and high (coefficient (r) values of 0.613), respectively. Consequently, it has been established that the identified variables of the study have significant correlations; thereby, leading the analysis towards assessing the impacts of these variables on the acceptance of HIS across the Iraqi private healthcare sector.

4.5 Regression Analysis

It is used for predicting the likely impacts of the identified relationship of the respective variables, having one dependent and many independent variables. It is distinguished from the results of correlation on the basis of its unique aspect of assuming a causal relationship in between the identified variables (Montgomery, Peck, and Vining, 2015). With respect to the validation of the formulated hypotheses, in terms of determining the relationship in between the identified multiple independent variables (Facilitating Condition, Social Influence, Performance Expectancy, and Effort Expectancy) and one dependent variable (Behavioural intention/User behaviour), multivariate linear regression analysis has been carried out.

4.5.1 For Behavioral Intention (H2, H3, H4, and H5)

The Table below presents the entered dependent variable with multiple independent variables, followed by the model summary table (Table 16). (Table 16) as the representation of model summary has the constructs of R (Multiple correlation coefficients), R^2 as its square, and the adjusted value of R^2 as well. It is noted that the value of R as Multiple Regression Coefficient is 0.613 (Closest to 1 makes the correlation Strong) that represents a moderate level of correlation in between the dependent and independent variables. Besides, the results of R^2 indicate that 37.6% of the population agreeing in relation to the aforementioned level of correlation in between the identified variables. Furthermore, the adjusted value of R^2 represents that 37.2% of the population has agreed to this level of correlation of behavioral intention for all the independent variables.

61

Table 15: Variables Entered for Analysis

Variables Entered/Removed[a]			
Model	*Variables Entered*	*Variables Removed*	*Method*
1	Facilitating Condition, Social Influence, Performance Expectancy, Effort Expectancy[b]	.	Enter
a. Dependent Variable: Behavioural Intention			
b. All requested variables entered.			

Table 16: Model Summary

Model Summary				
Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*
1	.613[a]	.376	.372	.84749
a. Predictors: (Constant), Behavioural Intention				

Afterwards, F-test value for all the formulated null hypotheses ($H_{2.0}$, $H_{3.0}$, $H_{4.0}$, and $H_{5.0}$) has been acquired through the ANOVA test (See Appendix A), keeping the value of confidence interval at 95% and significance values of 0.05. Table below reflects that the sig. value has been 0.00 that is less than 0.05; thereby, affirming the significance of the overall regression model (shown below).

$F(4,181)=93.471$ $p<0.05$ (See Appendix A)

Since, the ANOVA test has affirmed the significance of correlation in between the identified variables, the analysis leads to t-test. At this level, the relationship is assessed on an individual level, considering each independent variable in relation to the dependent variable. Accordingly, the estimated value of regression coefficients is represented as the "*Unstandardized Coefficients*". It represents the changing impact on the dependent variable (Behavioural Intention) with respect to the independent

variable, keeping all others constant while one variable increases. Consequently, it is affirmed that *Effort Expectancy* has no effect on the *Behavioural Intention* towards HIS adoption, since its sig. value is greater than 0.05 that makes the relationship insignificant; thus, rejecting $H_{3.1}$. However, *Performance Expectancy*, *Social Influence*, and *Facilitating Conditions* are affirmed to have significant impact on the *Behavioural Intention* towards HIS adoption (Table 17).

Besides, the t-value for the respective variables indicate that the influence of Facilitating Conditions (t-value of 5.849) on Behavioural Intention is the highest, followed of the moderators of Performance Expectancy (t-value of 4.708), and Social Influence (t-value of 3.067), and Facilitating Conditions (t-value of 5.849). Therefore, the results validate the following hypotheses:

$H_{2.1}$: Performance Expectancy (PE) has significant impact on the Behavioural Intention to use HIS.

$H_{3.0}$: Effort Expectancy (EE) has no significant impact on the Behavioural Intention to use HIS.

$H_{4.1}$: Social Influence (SI) has significant impact on the Behavioural Intention to use HIS.

$H_{5.1}$: Facilitating Conditions (FC) have significant impact on the Use Behaviour of HIS.

Table 17: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	*Std. Error*	*Beta*		
1	(Constant)	.163	.195	2.9	.837	.404
	Performance Expectancy	.337	.072	.326	4.708	.000
	Effort Expectancy	.057	.072	.058	.786	.433
	Social Influence	.212	.069	.188	3.067	.003
	Facilitating Condition	.357	.061	.373	5.849	.000
a. Dependent Variable: Behavioural Intention						

4.5.2 For User Behavior (H₁)

After analyzing the relationship significance in between the identified independent variables of *Performance Expectancy, Efforts Expectancy, Social Influence and Facilitating Conditions* with the dependent variable of *Behavioural Intention,* the analysis proceeds to the impacts of Behavioural Intentions in terms of directing the *User Behaviour*. The Table below represents the variables entry for ANOVA analysis.

Table 18 Variables entered for Analysis

Model	Variables Entered	Variables Removed	Method
1	Behavioural Intention[b]	.	Enter
a. Dependent Variable: User Behaviour			
b. All requested variables entered.			

Subsequently, F-test value for the null hypothesis $H_{1.0}$ has been acquired through the ANOVA test (See Appendix B), keeping the value of confidence interval at 95% and significance value of 0.05. It is noted that the sig. value is 0.00 that is less than 0.05; thereby, affirming the significance of the overall regression model (shown below).

$F(1,192)=115.553$ $p<0.05$ (See Appendix B)

Similar to the above case with independent variable of *Behavioural Intention,* t-test has been conducted for assessing the relationship strength in between the dependent variable of *User Behaviour* and the independent or constant variable of *Behavioural Intention.* The Sig. value has been taken as 0.05 for confidence interval of 95% that makes the relationship of *User Behaviour* and *Behavioural Intention* significant, since the p-value is 0.000 that is less than 0.05.

Besides, the t-value of Behavioural Intention (10.750) indicates that it has considerable impact on the User Behaviour (UB) towards the acceptance and use of HIS across the private healthcare sector of Iraq (Table below). Moreover, per unit increase in behavioral intention would yield an increase of 0.613 degree/unit in the user behaviour towards HIS adoption. Therefore, the results validate the hypothesis *$H_{1.1}$: Behavioural Intention has significant impact on User behaviour.*

Table 19: Regression Coefficients

Coefficients[a]					
Model	*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig.*
	B	*Std. Error*	*Beta*		
1 (Constant)	1.063	.223	3	4.767	.000
Behavioural Intention	.630	.059	.613	10.750	.000
a. Dependent Variable: User Behaviour					

4.6 Discussion

At first, the researcher has gained significant insights regarding the significance of HIS adoption across the healthcare sector by reviewing the easily accessible relevant literature from the past studies. More specifically, the researcher has investigated the implications of HIS across the private healthcare sector of Iraq, being the focus of the study. Accordingly, it has been noted that the successful implementation of HIS across the targeted domain has been challenging, which has been asserted based on the identified challenges of Financial resources (AbdGhani and Neamah, 2016), and technological constraints or vulnerabilities of IT-infrastructure (Ghani and Jaber, 2015). Consequently, the researcher has investigated the best approach of assessing the potential acceptance and use of HIS across the Iraqi private healthcare sector, in terms of the model of UTAUT. Numerous studies have affirmed the significance of UTAUT in this regard (Al-Hadban, 2016; Kohnke, Cole, and Bush, 2014; Venkatesh, Sykes, and Zhang, 2011; Kijsanayotin, Pannarunothai, and Speedie, 2009; Ami-Narh, and Williams, 2012; Ifinedo, 2012).

Moreover, the overall analysis in relation to the quantitative findings yields the impact that the deployment of the UTAUT model has been effective in determining the current situation for the adoption of HIS across the private healthcare sector of Iraq. The demographic details have also been supportive in interpreting the results with respect to generalizability. Both the genders, males and females, have given their valued contribution to the study. It has also been noted that the majority of the participants were young adults, being the potential users of HIS at the institutional level for being employed as doctors and administrative staff. Moreover, the level of education has also been complemented. However, the knowledge of computer and

internet requires further development, as the participants have not responded to adopt the internet as a considerable integration in their daily routine.

All the constructs of UTAUT as the identified independent and dependent variables have been analyzed thoroughly, mitigating all the possible flaws or limitations. At first, the adequacy of sampling has been assessed through KMO and Bartlett's test, along with the ascertained feasibility of running factor analysis on the datasets. Later on, factor analysis has made the interpretation of dataset to be effortless or easier to some extent, by means of reducing or summarizing the long-listed constructs of the respective variables to the most influential ones. Consequently, correlation analysis has successfully rejected three of the null hypotheses, directing the study towards the valid hypotheses. Therefore, regression analysis has been performed, which has involved ANOVA (F-test) and t-test for two cases: relationship in between the four independent variables (*Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)*) and the dependent variable of *Behavioural Intention* and between *Behavioural Intention (BI)* (as independent variable) and *User Behaviour (UB)* (as the dependent variable) as well.

 Resultantly, the impacts of *Efforts Expectancy (EE)* in relation to determining the *Behavioural Intention (BI)* of the users of HIS has been rejected, since the sig. value has been greater than 0.05. Nonetheless, the other independent variables ((*Performance Expectancy (PE), Social Influence (SI), and Facilitating Conditions (FC)*) are affirmed to have significant impacts on *Behavioural Intention* towards HIS adoption. In addition to this, the relationship in between the *Behavioural Intention* and *User Behaviour*, with respect to the adoption of HIS across the private healthcare sector of Iraq has also been significant. As a result, UTAUT model has been

efficacious in dealing with the assessment of HIS adoption across the less-technologically aligned state of Iraq; thus, making the research a potential contribution to the study context. As a result, it has been affirmed that these two variables have a significant relationship. Therefore the effectiveness of the UTAUT model in determining the HIS adoption across the private healthcare sector of Iraq is affirmed, supporting the research outcomes of Al-Hadban, (2016), Kohnke, Cole, and Bush, (2014), Venkatesh, Sykes, and Zhang, (2011), Kijsanayotin, Pannarunothai, and Speedie, (2009), Ami-Narh, and Williams, (2012), and Ifinedo, (2012).

CHAPTER 5

CONCLUSION AND FUTURE WORK

5.1 Conclusion

The current study focuses the healthcare sector of Iraq, particularly the private sector with respect to the current scenario for the adoption of HIS (Health Information System) technology. Prior to approaching the healthcare representatives for assessing their HIS adoption, relevant past studies have been explored thoroughly, which has then facilitated the identification of the potential constructs of e- health to be HIS or Health Information System; thus, accomplishing the second objective of the study. In addition to this, the researcher has also reviewed the literature in relation to acknowledging the significance of HIS deployment across the healthcare sector. Accordingly, it has been identified that the challenges of financial resources and technological constraints or vulnerabilities of IT-infrastructure have been significantly affecting the adoption of HIS across the private healthcare sector of Iraq, which is in accordance with the study outcomes of AbdGhani and Neamah, (2016), and Ghani and Jaber, (2015), respectively.

The research does not end here, as the implications of HIS across the Iraqi healthcare sector have further been assessed through quantitative measures. For this purpose, the deployment of the UTAUT model has been assessed with respect to determining the adoption of HIS across the private healthcare sector of Iraq. Since the research has specifically adopted UTAUT model, its potential significance in relation to the assessment of behaviour towards technology adoption has been reviewed across the

literature, as contended by the studies of Alharbi (2014), Cheon et al. (2012), Moryson and Moeser (2016), and Venkatesh, et al., (2012). *Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)*) have been the independent variables, and *Behavioural Intention* and *User Behaviour (UB)* have been the dependent variables of the study.

In order to assess the effectiveness of the UTAUT model in relation to the current state of HIS adoption across the private healthcare sector of Iraq, it has been established that the quantitative mode of data collection would be greatly efficacious to assert the concluding remarks. Accordingly, the identified variables of the UTAUT model have been reviewed across the literature, which has facilitated the construction of the survey questionnaire. All the constructs of the survey have been possibly aligned with the identified variables, in order to acquire the most relevant and credible results. The survey has close-ended questions that have been analyzed on the basis of 5-point scale. Moreover, the researcher has also inquired the demographic aspects of the participants, in order to better assess the HIS adoption, and potentially generalizing the findings as well. Subsequently, the researcher has sampled 250 individuals of the targeted population of the Iraqi private healthcare sector, involving the doctors, administrative staff, and IT specialists. By means of using KMO and Bartlett's test, the researcher has first affirmed the adequacy of sampling and existence of correlation in between the variables. Later on, the technique of Factor Analysis has been employed to make the interpretation of the data effortless to a certain extent. It has then resulted in minimizing the 32 constructs of the survey to 22 constructs, which have been most influential in terms of the anticipated relationship in between the variables. Once the constructs have been

minimized, the study proceeds with correlation analysis, in which the Pearson correlation with two-tailed sig. value of 0.01 has yielded the results of confirming the statistical significance of all the variables. Afterwards, the impacts of the relationship in between the independent and dependent variables of the study have been assessed through Regression analysis technique, with respect to the analysis of valid hypotheses.

Accordingly, the implications of ANOVA and t-test have yielded the results that one of the independent variables, *Effort Expectancy (EE)* has no impacts on the dependent variable of *Behavioural Intention (BI)* towards HIS adoption, while all other independent variables have a significant relationship, accordingly (since the respective sig. values of PE, SI, and FC are less than the threshold value of 0.05, except for EE). In addition to this, the impact of *Behavioural Intention* being the independent variable, and the *User Behaviour* being the dependent variable has also been assessed through the similar analysis technique of Regression. It has been established that the private healthcare sector of Iraq needs to arrange awareness programs to make the potential users of HIS acknowledge its importance, followed by providing relevant trainings and assistance in this regard..

5.2 Limitations

With respect to the limitations of this study, it can be stated that the sample size could have been larger that would add the prospect of generalizability to the research findings. Another limitation could be the population of the study, since the study has targeted only the Iraqi private healthcare sector.

5.3 Future works

Finally, it can be a valued direction for future research in the same study context, if larger sample size is taken, and the entire healthcare sector of Iraq (both the private and government) is targeted as the population of the study. Also face to face interviews would reveal participants' insights about the subject.

REFERENCES

1 **Abd.Ghani, K. M. and Neamah, F. A. 2016**,*"Electronic Health Records Challenges and Barriers in Iraq"* .Computer Engineering and Intelligent Systems.7(6).

2 **AbouZahr, C. and Boerma, T., 2005**, *"Health information systems: the foundations of public health"*. Bulletin of the World Health Organization, 83(8), pp.578-583.

3 **Agarwal, R., Gao, G., DesRoches, C. and Jha, A.K., 2011.** *,"The role of information systems in healthcare"*: Current research and road ahead. Information Systems Research,*22*, pp.419-428.

4 **Al-Hadban, W.K.M., 2016.** *,"Revisiting the UTAUT in Iraq Public Healthcare Sector. Journal of Engineering and Applied Sciences"* , *100*(3), pp.644-654.

5 **Alharbi, S. and Drew, S., 2014.** *,"Using the technology acceptance model in understanding academics' behavioral intention to use learning management systems"*, International Journal of Advanced Computer Science and Applications (IJACSA*)*, *5*(1).

6 **Ali, A.A., Abdulsalam, I. and Hasan, A.M., 2011.** *,"Iraq Health Information System Review and Assessment",* Iraq, Baghdad.

7 **Almunawar, M.N. and Anshari, M., 2012., "***Health information systems (HIS): Concept and technology*"*,.arXiv preprint arXiv*:1203.3923*.

8 **Alshamari, M.A. and Seliaman, M.E., 2014**. *," Modeling the Determinants of Medical Information Systems Usability in Saudi Arabia",* ACHI 2014 : The Seventh International Conference on Advances in Computer-Human Interactions

9   **Alwan, A., (2004).** *,"Health in Iraq, The Current Situation, Our Vision for the Future and Areas of Work, Ministry of Hea*lth"*, Retrieved from, <ins>http://www.who.int/hac/crises/irq/background/Iraq_Health_in_Iraq_second_editi on.pdf</ins>

10 **Ami-Narh, J.T. and Williams, P.A., 2012.** *,"A revised UTAUT model to investigate E-health acceptance of health professionals in Africa"*

11 **Bah, S., Alharthi, H., El Mahalli, A.A., Jabali, A., Al-Qahtani, M. and Al-kahtani, N., 2011**. *," Annual survey on the level and extent of usage of electronic health records in government-related hospitals in Eastern Province, Saudi Arabia",* Perspect Health Inf Manag, 8(Fall), p.1b.

12 **Balaraman, P. and Kosalram, K., 2013.**,*"E-Hospital Management & Hospital Information Systems-Changing Trends"*, International Journal of Information Engineering and Electronic Business, 5(1), p.50.

13 **Balgrosky, J.A., 2014.** *,"Essentials of Health Information Systems and Technology"*, Jones & Bartlett Publishers.

14 **Bernard, H. R. (2011).** *,"Research methods in anthropology: Qualitative and quantitative approaches",* Rowman Altamira

15 **Bhattacherjee, A., Hikmet, N., Menachemi, N., Kayhan, V.O. and Brooks, R.G., 2006.** *,The differential performance effects of healthcare information technology adoption"*, Information Systems Management, 24(1), pp.5-14.

16 **Botha, M., Botha, A. and Herselman, M., 2014.** *,"The Benefits and Challenges of e-Health Applications: A Content Analysis of the South African contex,t"*, International Conference on Computer Science, Computer Engineering, and Social Media.

17 **Bryman, A. (2015).** *,"Social research methods"*, Oxford: Oxford University Press.

18 **Bryman, A. and Bell, E., 2015.** *,"Business research methods"*, Oxford University Press, USA.

19 **Buntin, M.B., Burke, M.F., Hoaglin, M.C. and Blumenthal, D., 2011**. *,"The benefits of health information technology: a review of the recent literature shows predominantly positive results"*, Health affairs, 30(3), pp.464-471.

20 **Burns, R. P., and Burns, R. (2008).** *,"Business research methods and statistics using SPSS"*, Sage.

21 **Cheon, J., Lee, S., Crooks, S.M. and Song, J., 2012**. *,"An investigation of mobile learning readiness in higher education based on the theory of planned behaviour"*, Computers & Education, 59(3), pp.1054-1064.

22 **Cheung, R. and Vogel, D., 2013.** *,"Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning",* Computers & Education, 63, pp.160-175.

23 **Cilliers, L. and Flowerday, S.V., 2013.** *,"Health information systems to improve health care: A telemedicine case study",* SA Journal of Information Management, 15(1), pp.5-pages.

24 **Cohen, J., Aiken, L. S., Cohen, P., and West, S. G. (2013).** *,"Applied multiple regression/correlation analysis for the behavioral sciences"*, Routledge.

25 **Collis, J. & Hussey, R., (2013).** *,"Business research: A practical guide for undergraduate and postgraduate students"*, Palgrave Macmillan.

26 **Cooper, D. R., Schindler,P. S., & Sun, J. (2003).**,*"Business research methods"*

27 **Cordos, A., Orza, B., Vlaicu, A., Meza, S., Avram, C. and Petrovan, B., 2010.** *,"Hospital Information System using HL7 and DICOM standards",* WSEAS Transactions on Information Science and Applications, 7(10), pp.1295-1304.

28 **Crano, W.D., Brewer, M.B. and Lac, A., 2014.** *,"Principles and methods of social research"*, Routledge.

29 **Cresswell, K. and Sheikh, A., 2013.** *,"Organizational issues in the implementation and adoption of health information technology innovations: an interpretative review",* International journal of medical informatics, 82(5), pp.e73-e86.

30 **Creswell, J. W., (2013).** *,"Research design: Qualitative, quantitative, and mixed methods approaches",* Sage publications.

31 **Davies, M. B., & Hughes, N. (2014).** *,"Doing a successful research project: Using qualitative or quantitative methods",* Palgrave Macmillan.

32 **Denscombe, M. (2014).** *,"The good research guide: for small-scale social research project",* London: McGraw-Hill Education.

33 **Feilzer, M. Y. (2010).** *"Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm",* Journal of Mixed Methods Research, vol. 4(1), pp.6-16.

34 **Flick, U. (2015).** *,"Introducing research methodology: A beginner's guide to doing a research project",* Sage.

35 **Fowler Jr, F. J., (2013).** *,"Survey research methods",* Sage publications.

36 **Franck, R. (2013).** *,"The explanatory power of models: bridging the gap between empirical and theoretical research in the social sciences",* (Vol. 1). New York: Springer Science & Business Media.

37 **Ghani, M.K.A. and Jaber, M.M., 2015.** *,"Willingness to adopt telemedicine in major Iraqi hospitals: a pilot study",* International journal of telemedicine and applications, 2015, p.6.

38 **Gray, D. E. (2013).** *,"Doing research in the real world",* Sage.

39 **Gücin, N.Ö. and Berk, Ö.S., 2015.** *,"Technology Acceptance in Health Care: An Integrative Review of Predictive Factors and Intervention Programs",* Procedia-Social and Behavioural Sciences, 195, pp.1698-1704.

40 **Healy, J.C., 2008.** *,"Implementing e-Health in developing countries: Guidance and principles. ICT Applications and Cyber security Division (CYB)"*, Policies and Strategies Department.[monografía en Internet]. Bureau for Telecommunication Development International Telecommunication Union.

41 **Herrick, D.M., Gorman, L. and Goodman, J.C., 2010.** *,"Health information technology: Benefits and problems"*, National Center for Policy Analysis.

42 **Holden, R.J. and Karsh, B.T., 2010.** *,"The technology acceptance model: its past and its future in health care",* Journal of biomedical informatics, 43(1), pp.159-172.

43 **Hoque, M.R., Mazmum, M. and Bao, Y., 2014.** *,"e-Health in Bangladesh: current status, challenges, and future direction"*, Int Tech Manag Rev, 4(2), pp.87-96.

44 **Hung, S.Y., Tsai, J.C.A. and Chuang, C.C., 2014.** *,"Investigating primary health care nurses' intention to use information technology: An empirical study in Taiwan"*, Decision Support Systems, 57, pp.331-342.

45 **Ifinedo, P., 2012, January.** *,"Technology acceptance by health professionals in Canada: An analysis with a modified UTAUT mode",* In System Science (HICSS), 2012 45th Hawaii International Conference on (pp. 2937-2946). IEEE.

46 **Internet Live Stats, (2017).** *,"Iraq Internet Users"*, Retrieved from, http://www.internetlivestats.com/internet-users/iraq/

47 **Jackson, S. (2015).** *," Research methods and statistics*: A critical thinking approach"*, Boston: Cengage Learning.

48 **Kaplan, B. and Harris-Salamone, K.D., 2009.** *,"Health IT success and failure: recommendations from literature and an AMIA workshop"*, Journal of the American Medical Informatics Association, 16(3), pp.291-299.

49 **Khalifehsoltani, S.N. and Gerami, M.R., 2010, January**. *,"E-health challenges, opportunities and experiences of developing countries. In e-*

Education, e-Business, e-Management, and e-Learning,", 2010.IC4E'10. International Conference on (pp. 264-268). IEEE.

50 Kijsanayotin, B., Pannarunothai, S. and Speedie, S.M., 2009. ,"*Factors influencing health information technology adoption in Thailand's community health centers: Applying the UTAUT model*,", International journal of medical informatics, 78(6), pp.404-416.

51 Kline, P. (2014). ,"*An easy guide to factor analysi*", Routledge.

52 Kohnke, A., Cole, M.L. and Bush, R., 2014. ,"*Incorporating UTAUT predictors for understanding home care patients' and clinician's acceptance of healthcare telemedicine equipment*", Journal of technology management & innovation, 9(2), pp.29-41.

53 Lewis, S. (2015). ,"*Qualitative inquiry and research design: Choosing among five approaches*", Health promotion practice

54 Menachemi, N. and Collum, T.H., 2011. ,"*Benefits and drawbacks of electronic health record systems*", Risk Manag Healthc Policy, 4, pp.47-55.

55 Mendenhall, W., Beaver, R. J., & Beaver, B. M. (2012). ,"*Introduction to probability and statistics*", Cengage Learning.

56 Mitchell, M., & Jolley, J. (2012). ,"*Research design explained*", Boston: Cengage Learning,.

57 Montgomery, D. C., Vining, G. G., and Peck, E. A., (2015). ,"*Introduction to linear regression analysis*", John Wiley & Sons.

58 Moore, M., Anthony, C.R., Lim, Y.W., Jones, S.S., Overton, A. and Yoong, J.K., 2014. ,"*The Future of Health Care in the Kurdistan Region—Iraq: Toward an Effective, High-Quality System with an Emphasis on Primary Care*", Rand health quarterly, 4(2).

59 Moryson, H. and Moeser, G., 2016. *,"Consumer adoption of cloud computing services in germany: investigation of moderating effects by applying an UTAUT model",* International Journal of Marketing Studies, 8(1), p.14.

60 Muema, J.K., 2014. *,"Adoption of Integrated Healthcare Information System in Nairobi Count*y", Kenyatta National Hospital versus Mater Hospital.

61 Ngafeeson, M. N. (2015*)."Healthcare Information Systems Opportunities and Challenges*", In Encyclopedia of Information Science and Technology, Third Edition (pp. 3387-3395). IGI Global.

62 Ngafeeson, M.N., 2015. *"Healthcare Information Systems Opportunities and Challenges",* In Encyclopedia of Information Science and Technology, Third Edition (pp. 3387-3395).IGI Global.

63 Novak, L.L., Anders, S., Gadd, C.S. and Lorenzi, N.M., 2012. *,"Mediation of adoption and use: a key strategy for mitigating unintended consequences of health IT implementation*,", Journal of the American Medical Informatics Association, 19(6), pp.1043-1049.

64 Nuq, P.A. and Aubert, B., 2013. ,"*Towards a better understanding of the intention to use eHealth services by medical professionals: The case of developing countries",* International Journal of Healthcare Management, 6(4), pp.217-236.

65 Oh, H., Rizo, C., Enkin, M. and Jadad, A., 2005. *,"What is eHealth?: a systematic review of published definition",* World Hosp Health Serv, 41(1), pp.32-40.

66 Park, N., Roman, R., Lee, S. and Chung, J.E., 2009*,"User acceptance of a digital library system in developing countries: An application of the Technology Acceptance Model*", International journal of information management, 29(3), pp.196-209.

67 Park, S.Y., 2009. ,"*An analysis of the technology acceptance model in understanding university students' behavioral intention to use e-learning*", Educational technology & society, 12(3), pp.150-162.

68 Phichitchaisopa, N. and Naenna, T., 2013. *," Factors affecting the adoption of healthcare information technology*", EXCLI journal, 12, p.413.

69 Piette, J.D., Lun, K.C., MouraJr, L.A., Fraser, H.S., Mechael, P.N., Powell, J. and Khoja, S.R., 2012. *,"Impacts of e-health on the outcomes of care in low- and middle-income countries: where do we go from here",* Bulletin of the World Health Organization, 90(5), pp.365-372.

70 Shekelle, P., Morton, S.C. and Keeler, E.B., 2006. *,"Costs and benefits of health information technology*", retrieved from, https://www.ncbi.nlm.nih.gov/books/NBK37988/

71 Taylor, S. J., DeVault, M., & Bogdan, R., (2015). *," Introduction to qualitative research methods: A guidebook and resource",* John Wiley & Sons.

72 Toromanovic, S., Hasanovic, E. and Masic, I., 2010. ,"*Nursing information systems",* Materia socio-medica, 22(3), p.168.

73 Trotter, R. T. (2012). *,"Qualitative research sample design and sample sise: Resolving and unresolved issues and inferential imperatives*,". Preventive medicine, 55(5), 398-400.

74 Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D., 2003. *,"User acceptance of information technology",* Toward a unified view. MIS quarterly, pp.425-478.

75 Venkatesh, V., Sykes, T.A. and Zhang, X., 2011, January. *,"Just what the doctor ordered': a revised UTAUT for EMR system adoption and use by doctors*", In System Sciences (HICSS), 2011 44th Hawaii International Conference on (pp. 1-10). IEEE.

76 Venkatesh, V., Thong, J.Y. and Xu, X., 2012. ,"*Consumer acceptance and use of information technology*", extending the unified theory of acceptance and use of technology.

77 Wang, B.B., Wan, T.T., Burke, D.E., Bazzoli, G.J. and Lin, B.Y., 2005. *,"Factors influencing health information system adoption in American hospitals",* Health care management review, 30(1), pp.44-51.

78 **Weiss, N. A., and Weiss, C. A. (2012).** *,"Introductory statistics. London",* Pearson Education.

79 **Williams, M.D., Rana, N.P. and Dwivedi, Y.K., 2015.** *,"The unified theory of acceptance and use of technology (UTAUT)* a literature review",* Journal of Enterprise Information Management, 28(3), pp.443-488.

80 **World Health Organization, (2007).** *,"Framework and Standards for Country, Health Information Systems", Health Metrics Network.*

81 **Yazdi-Feyzabadi, V., Emami, M. and Mehrolhassani, M.H., 2015.** *,"Health information system in primary health care: the challenges and barriers from local providers' perspective of an area in Iran",* International journal of preventive   medicine, 6.retrieved   from, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4505398/

82 **Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013).** *,"Business research methods",* Cengage Learning.

Appendices

Appendix A

Table 20 NOVA Statistics

ANOVA[a]						
Model		*Sum of Squares*	*Df*	*Mean Square*	*F*	*Sig.*
1	Regression	121.050	4	30.263	93.471	.000[b]
	Residual	57.306	177	.324		
	Total	178.357	181			
a. Dependent Variable: Behavioural Intention						
b. Predictors: (Constant), Facilitating Condition, Social Influence, Performance Expectancy, Effort Expectancy						

Appendix B

Table 21: ANOVA Statistics

ANOVA[a]						
Model		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	82.995	1	82.995	115.553	.000[b]
	Residual	137.903	192	.718		
	Total	220.898	193			
a. Dependent Variable: User Behaviour						
b. Predictors: (Constant), Behavioural Intention						

Appendix C:

Screenshots of the Questionnaire

Performance Expectancy (perceptions regarding the implications of HIS)

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrational needs of hospitals. In many implementations, a HIS is a comprehensive, integrated information system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services.

Using IT for patient care and management seems appealing

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Using IT for patient care will be productive

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

IT seems compatible to my work

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

IT integration matches my working attitude

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Prompt and effortless completion of tasks will be facilitated

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Work Efficiency will be improved

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Patient care will be improved

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

BACK   NEXT   Page 4 of 9

Effort Expectancy (Degree of ease)

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrational needs of hospitals. In many implementations, a HIS is a comprehensive, integrated information system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services.

I can easily use IT as I am experienced in such technologies

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I can easily use IT if I am provided relevant training

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I can easily use IT if there is a support service or user manual

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Using IT on work is not annoying

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Its complexity does not scare me

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I find it easy to use

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I find the interactivity understandable

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I would be needing enough mental efforts

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I would be making errors

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

BACK   NEXT   Page 5 of 9

Social Influence (perceived efficacy based on others' beliefs or support)

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrational needs of hospitals. In many implementations, a HIS is a comprehensive, integrated information system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services.

Being technological/technical, my image would be improved

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I believe IT users are highly skilled

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I will be needing enough support from the supervisor

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I would be requiring significant encouraging attitude

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I would be needing proper access to the system

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I would be needing support until satisfactory performance

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Using HIS will be beneficial in serving the patients' needs

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Using HIS is associated with my willingness to provide improved care

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

BACK   NEXT   Page 6 of 9

User Behavior

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrational needs of hospitals. In many implementations, a HIS is a comprehensive, integrated information system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services.

IT is already in my practice

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I have experienced IT in my field

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

BACK   SUBMIT   Page 9 of 9

Facilitating Conditions (perceived degree of HIS integration within the organisation's existing framework)

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrational needs of hospitals. In many implementations, a HIS is a comprehensive, integrated information system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services.

Efficient resources are there to use HIS

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

Considerable knowledge is there to exercise HIS in patient care

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I think HIS must be compatible with existing technologies

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

BACK   NEXT   Page 7 of 9

Behavioral Intention

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrational needs of hospitals. In many implementations, a HIS is a comprehensive, integrated information system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services.

If it is favourable, I will use it

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I will use it for clinically facilitating the patients' needs

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

I will adopt it for frequent usage

	1	2	3	4	5	
Disagree	○	○	○	○	○	Agree

BACK   NEXT   Page 8 of 9

Appendix D:

The link of the online questionnaire:
https://docs.google.com/forms/d/e/1FAIpQLSd6T8TJdCV16ArDzUKbnsnlJ_XoPTaq1AKrT1BQqWljP6J2yw/viewform?c=0&w=1

<div align="center">**CURRICULUM VITAE**</div>

PERSONAL INFORMATION
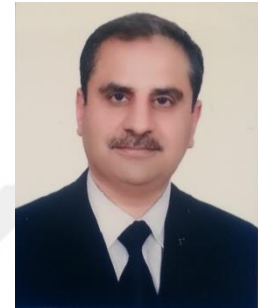
Surname, Name: WAHAB Yousif

Date and Place of Birth: 1976 Iraq

Marital Status: Married

Phone: +9647701334070

Email: yosfmw2@yahoo.com

EDUCATION

Degree	Institution	Year of Graduation
M. Sc.	Cankaya University	2017
B. Sc.	Mosul University	2001
Diploma	Kirkuk Technical Institute	1997
High School	Al-Thawra High School	1994

WORK EXPERIENCE

Year	Place	Enrolment
2007- present	Kirkuk University	Programmer