Critical Factors Affecting Electronic Health Records Adoption in Private Hospitals in Amman

Prepared by

Maha H. Al-Abdullah

Supervisor

Prof. Anas A.AL-Bakri

Thesis submitted in partial fulfillment of the requirements

for the degree of

Master of E-Business

Business Administration Department

Business College

Middle East University

January 2012

II

AUTHORIZATION

I am Maha H .Al -Abdullah, authorize Middle East University to provide hard copy or electronic copy of my thesis to libraries, institutions or people when asked.

Name: Maha H.Al-Abdullah

Date: 16.1.2012

Signature: Maha

DISSCUSSION OF COMMITTEE DECISION

This dissertation was discussed under title:

Critical Factors Affecting Electronic Health Records Adoption in Private Hospitals in Amman

"العوامل المؤثرة في تبني استخدام السجلات الطبية الإلكترونية في المستشفيات الخاصة في عمان "

It's approved on: 16 /01 /2012

Discussion committee	***Working place***	***Signature***
Dr. Mohmmed Al- Shoura	***Head of Committee "MEU"***	
Dr .Anas A. AlBakri	***Supervisor "MEU"***	
Prof. Saad Ghaleb Yaseen	***External Examiner "Alzayatoonah University "***	

ACKNOWLEDGEMENT

Foremost, I thank Allah the Almighty, to whom I owe what I have achieved so far .

I would like to express all my gratitude for people I do respect and I thank them from all my heart for their assistance, support and encouragement they have given me during my study.

I will begin with my supervisor, Dr. Anas AL-Bakri, who has given me continuous support and knowledge throughout this journey and was my mentor for the past year of my study.

I also want to thank my wonderful parents for their patience, compassion and guidance. I would not have been what I am now without having such a great family that supported and encouraged me to be a better person and fulfill my dreams.

Moreover, I can never forget to thank my faithful friends who have been there for me all the way through until this work was finally done.

To all those people, I dedicate my thesis with acknowledgement and pride.

DEDICATION

I specially dedicate this thesis to my father who has been a great motive for me; I also dedicate it to my mother who has raised me to be the person I am now. May Allah give them peace and happiness in their life and give them heaven in the hereafter, Amen.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

DF	Degree of Freedom
IS	Information System
IT	Information Technology
Sig	Significant
TAM	Technology Acceptance Model
EHR	Electronic Health Records
EMR	Electronic Medical Records
HIT	Health Information Technology
PHR	Personal Health Record
CDE	Clinical Data Exchanges
CCR	Continuity of Care Record
CRS	Care Record Summary
DSS	Decision Support System
CDSS	Clinical Decision Support System
CDR	Clinical Data Repository
CMV	Controlled Medical Vocabulary
CPOE	Computerized Provider Order Entry
IOM	Institute Of Medicine

Critical Factors Affecting Electronic Health Records Adoption in Private Hospital in Amman

Prepared by

Maha H.Al-Abdullah

Supervisor

Dr. Anas A. AL-Bakri

Despite a consensus that the use of health information technology should lead to more efficient, safer, and higher-quality care, there are no reliable estimates of the prevalence of adoption of electronic health records in Jordanian hospitals.

We surveyed all private hospitals in Amman that are members of the Jordanian Ministry of Health for the presence of specific electronic-record functionalities. Using a definition of electronic health records based on expert consensus, we determined the proportion of hospitals that had such systems in their clinical areas. We also examined the relationship of adoption of electronic health records to specific hospital characteristics and factors that were reported to be barriers to or facilitators of adoption.

On the basis of responses from 78.9 % of hospitals surveyed, respondents cited capital requirements, high maintenance costs, and technological factors as the primary barriers to implementation,

The very low levels of adoption of electronic health records in Amman private hospitals suggest that policymakers face substantial obstacles to the achievement of health care performance goals that depend on health information technology. A policy strategy focused on financial support, interoperability, and training of technical support staff may be necessary to spur adoption of electronic-records systems in Jordanian hospitals.

"العوال المؤثرة في تبني استخدام السجلات الطبية الإلكترونية في المستشفيات الخاصة في عمان"

إعداد

مها حسن العبدالله

إشراف

د. أنـس عبد الكريم البـكري

الملخّص باللغة العربية

رغم الإجماع على أن استخدام تكنولوجيا المعلومات الصحية ينبغي أن يؤدي إلى زيادة كفاءة وأكثر أمنا، ورعاية عالية الجودة، إلا انه لا توجد تقديرا ت لانتشار اعتماد السجلات الطبية الإلكترونية في المستشفيات الأردنية .قمنا باستطلاع جميع المستشفيات الخاصة في عمان والتي تتبع لوزارة الصحة الأردنية عن استخدام السجلات الطبية الالكترونية في أي قسم من أقسامها، و قمنا أيضا بدراسة خصائص محددة للمستشفى والعلاقة بين اعتماد استخدام السجلات الطبية الإلكترونية والعوامل التي يمكن أن تساعد على استخدامها أو تكون حواجز تحول دون استخدامها. حصلنا على استجابة 78.9 ٪ من المستشفيات التي شملتها الدراسة وأشار المستجيبون إلى أن متطلبات رأس المال، وتكاليف الصيانة العالية ، والعوامل التكنولوجية تعتبر أكثر الحواجز التي تعيق استخدام السجلات الطبية الالكترونية وجدنا أن اعتماد السجلات الطبية الإلكترونية في المستشفيات الخاصة في عمان متدني جدا و هذا يشير إلى أن صناع القرار يواجهون عقبات كبيرة في تحقيق أهداف الرعاية الصحية التي تعتمد على المعلومات الطبية الالكترونية. لذا يجب عليهم استخدام سياسة إستراتيجية تركز على الدعم المالي ، والتوافقية

، وتدريب موظفي الدعم التقني الضروري لتحفيز اعتماد نظم السجلات الطبية الإلكترونية في المستشفيات الأردنية .

Chapter One:

Study General Framework

1.1 Introduction

In line with the increase of internet users in Jordan, the demand of using Electronic Health Records (EHR) increased responding to the digital revaluation, we defined EHR as a collection of electronic health information regarding the care needed and already received by the patient, recorded in digital format, that allow users to share information with different health care settings, using network-connection. Health care records include wide range of data in a comprehensive or summary form including demographics, medical history, allergies, laboratory test results, radiology images, vital signs, personal state.

There are many benefits of using EHR for both patients and hospitals: reducing the cost, improving the quality of health services, ease of access for a large number of authorized people, information storing and ensuring confidentiality when required. (Petra Knaup et.al 2007)

Despite these benefits, there are disadvantages of using EHR such as wasting time and money during the process of converted paper record into electronic form, most of health care providers have technologically challenged power.

There are a number of implementation barriers which have impeded their widespread use.

1.2 Study Problems and Questions

The statement of the problem is: "**To study the factors that have influence on the adoption of electronic health record systems in private hospitals in Amman ?** In the above-mentioned research problem is reformulated in the following research questions:

1. Would financial factors affect EHR adoption in private hospitals in Amman?
2. Would technological factors affect EHR adoption in private hospitals in Amman?
3. Does the resistance to change affect EHR adoption in private hospitals in Amman?
4. Are security issues considered barriers to adopting EHR in private hospitals in Amman?

1.3Study Hypotheses

Ho1: There is no significant statistical effect of financial factors on the adoption of EHR in private hospitals in Amman.

Ho2: There is no significant statistical effect of technological factors on EHR adoption in private hospitals in Amman.

Ho3: There is no significant statistical effect of the resistance to change on the adoption of EHR in private hospitals in Amman.

Ho4: There is no significant statistical effect of security issues on EHR adoption in private hospitals in Amman.

1.4 The significance of the study

The importance of this research lies in the following reasons:

1- This research may reveal useful recommendations for all Jordanian hospitals to adopt EHR.

2- The scacity of similar kinds of studies here in Jordan

1.5 Study Objectives

1. Identifying and describing the current state of using, adopting and implementing EHR systems in selected private hospitals in Amman.

2. Identifying technological factors which encourage or limit the adoption of EHR systems in private hospitals in Amman.

3. Exploring the effect of financial factors on EHR adoption in private hospitals in Amman.

4. Exploring the effect of resistance change on EHR adoption in private hospitals in Amman.

5. Exploring the effect of security issues on EHR adoption in private hospitals in Amman.

1.6 Study Limitations

1- Limitation of location: Amman private hospitals only.

2- Limited time: August 2011 to December 2011

3- Human resources limitations: IT Managers in hospitals in Amman.

1.7 Study Delimitations

1- This research is based on a sample of private hospitals in Amman.

2- A limited number of hospital managers from these selected hospitals are chosen in this research.

1.8 Study Model

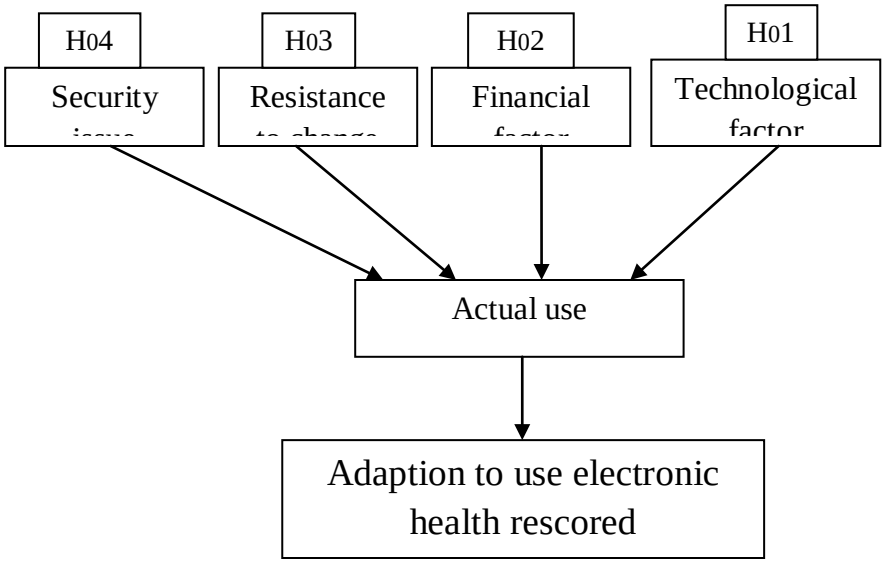

Figure (1) Study model developed by auther

1.8 Terminologies of the Study

1. **Technological factors :** Influences that have an impact on how an organization operates that are related are related to the equipment (haedwares's, software's) used within the organization's environment.

2. **Financial factors:** Any activates undertaken by a business to further the fulfillment of economic of economic goals .financial activities may include buying and selling of products or assets.

3. **Resistance to change** :Is the action by individuals and groups when they perceived that a change that is occurring as a threat to them.

4. **Information security** :Means protecting information and information systems from unauthorized access use, disclosure, disruption, modification,perusal,inspection,recording or destruction .

5. **Computer-Based Patient Record:** The IOM originally defined the CPR as "…an electronic patient record found in a system specifically designed to support users by providing accessibility for complete and accurate data, alerts, reminders, clinical decision support systems, links to medical knowledge, and other aids" (Dick et al., 1997, p. 55).

6. **Technology Acceptance Model (TAM):** is an information system theory that demonstrates how users accept and use certain technology. The model suggests that when users are provided with a new technology, a number of factors influence their decision about how and when they will use it (Wikipedia, 2010).

7. **Electronic Health Record**: Electronic health records (HER) , electronic patient records (EPR) or computerized patient records) are evolving concepts which are defined as the systematic collection of electronic health information about individual patients or populations (Gunter & Terry, 2005).

8. **Patient General Information:** Patient's name, date of birth, sex, address, telephone number, marital status, account number, service facility location, principal provider, social security number and account balances.

9. **Infrastructure :** The infrastructure includes the supporting hardware, software, and management system required to run a particular application (in this case of EHR) this includes the data networks (routers, wires, switches, hubs) workstations (PCs, laptops, hand-held devices) servers (database, applications, print/files) and telecommunications equipment and services (James et al.2006.p 21)

10. **The Network:** All systems that support more than a single user require a local area network (LAN) to allow different users to access the features, functions, and data in the EHR (James et al.2006 . p 21).

11. **Ease of Use**: The ability to deal with the system easily.

Chapter Two:

Theoretical Framework and Previous Studies

2.1 Introduction

This chapter discusses the literature review and present previous relevant research. This includes topics on EHR and EHR history and development, using EHR in Amman private hospitals, and the barriers which prevent EHR implementation. Later in this chapter, theoretical framework (variables and dimensions in this study) will be discussed. At the end, this chapter will present the most relevant previous researches which were useful for this study

2.1.1 Electronic Healthcare Record Systems

Health Information Technology (HIT) consists of different types of technologies that permit transmitting and managing health information for use by consumers, providers, insurers, and all the other groups which are interested in health and health care. Here we focus on technologies of storing and processing data about patients. Even if these technologies contain many types of systems, these systems are familiar to physicians, such as the computerized storage and reporting of laboratory results, that permit clinicians from sharing information about patients across institutional and geographic boundaries.

Many types of HIT are important, but EHR, personal health records (PHR), and clinical data exchanges (CDE) deserve particular attention because of their potential significance for health care services. The EHR is a technology that has the most important effect on the daily work of physicians and other health care providers.

According to the Institute of Medicine, EHR is a system that can do many functions electronically (Blumenthal,2007).

2.1.2 Electronic Health Records:

Each subset of CDO's EMR is defined as an EHR, which is supposed to include summaries, such as Continuity of Care Records (CCR) and Care Record Summary (CRS), some information from many organizations like the pharmacy benefit management firms, labs and other firms it also includes information about the health status of patients in the community within any area, region, state or even the whole country. The patient monitors the access of information. For example; In the United States, EHRs will ride **on** the proposed National Health Information Network (NHIN). After the implementation for EMR, the organization can create the EHRs. At this point, few acute care or ambulatory facilities have EMR solutions which are capable of reducing medical errors or improving the quality and efficiency of patient care. Care providers worked hard to achieve the EHR visions being espoused in Washington, D.C., and many of which have questionable business models and fundings, in various states of development across the country (Garets & Davis, 2005).

2.1.3 Benefits of Electronic Health Record System:

Some health care providers discussed the high costs of initial capital investment for applying EHR in organizations. However, considering the benefits of implementing EHR system which can offset costs involved in maintenance, training and upgrading the system, it is worth while to do the investment on the system. EHR provides many benefits to the government and health care providers as whole. It can be accessible from multiple locations and units within the enterprise. Therefore, the time of accessing the patient's medical record is reduced. Hence, the productivity will increase and the quality of care will improve. At the same time, it will allow applying the best clinical practices.

EHR also gives advantages to clinical procedures like better chart access, improvement of clinical decision making. disease management, documentation enhancement ,and increasing the free time spent with patients, which improves the perception of care and quality of work life. The primary test results of the decision support system (DSS) in drug management, and **disease management** gave importance to clinical processes. Moreover, specific advantages for physicians are: (1) information, such as medical and family history, clinical history vital signs ,the visit duration, chief complaints, and most recent lab test results are organized in proper format and easily retrieved, (2) the system prompts the physician to ask the right questions, reviews medications, updates information, and checks to see weather screening and monitoring tests are completed on schedule, (3) prescriptions and patient's education materials can be printed with the click of a button (Andrews, 2003).

2.2 Theoretical Framework Components

2.2.1 Factors Affecting EHR Adoption:

There are many factors barriers and facilitators which affect the adoption of EHR.

2.2.2 Technology Acceptance Model (TAM):

The TAM allows researchers to explain why a particular system may or may not be acceptable to users (Davis et al., 1989). It hypothesizes that there are two beliefs, perceiving usefulness and perceiving ease of use, which are variables that primarily affect the user acceptance. The TAM suggests that these external variables indirectly affect individuals' attitude toward technology acceptance by influencing perceived usefulness and perceived ease of use (Mary, 2008). External variables might include individual user attributes, social factors or those related to their job tasks. A series of studies found that TAM is the best model in examining Physicians' acceptance of telemedicine technology because it is specialized in information technology, it is well-researched, it uses psychometric measurements, and it is a dominant model for investigating user technology acceptance (Mary 2008, Chau & Hu, 2001, 2002; Hu et al., 1999).

2.2.3 Ease of Use and Information Technology Support:

Using EHR should improve the productivity of physicians. It should be easy to use in the examining room and program set-up which is uncomplicated and very important to physicians (Rogoski, 2003). Note that templates and order sets can be used to facilitate data entry. Facilities with fully implemented EHRs have provided widespread

availability of computer workstations in houses with off-site accessibility in physicians' offices and homes. Rapid system response time with limited system downtime and scheduled outages are significant issues related to the ease of use (Doolan et al., 2003). Twenty-four hour vendor support and technical assistance is necessary to ensure ease of use (Ash et al., 2000). Physicians expect immediate support without having to wait in line with other customers (Rogoski, 2003).

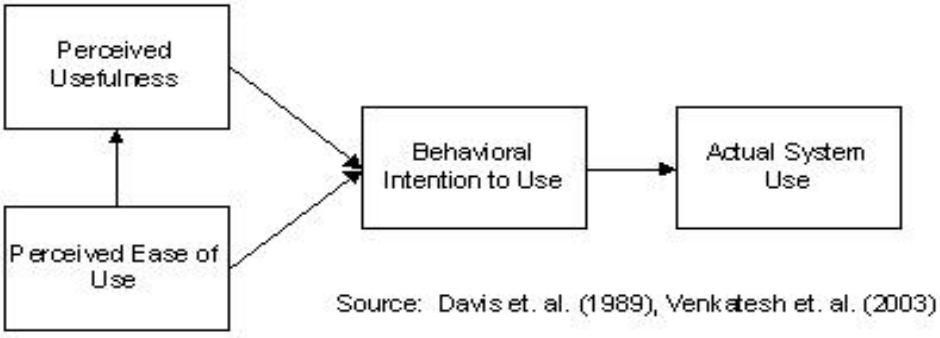

Figure (2) :TAM model

2.3 Previous Studies

1. (Jane Grimson,2001), Delivering the electronic healthcare record for the 21st century :

In spite of over four decades of research into Electronic Healthcare Record Systems, the penetration of records which incorporate more than simply basic information, into the working life of healthcare organizations is relatively small. This paper discusses some of the key impediments to progress including in particular, the lack of application of software engineering methodologies, the absence of usable standards, and the failure to acknowledge the impact of record systems on the healthcare system itself. However, Health Informatics researchers need to be paring for the next generation of systems which will be triggered by the twin revolutions of the Internet and Genetic Medicine.

This next generation of EHCR will be a longitudinal cradle-to-the-grave active record readily accessible and available via the Internet, and which will be linked to clinical protocols and guidelines to drive the delivery of healthcare to the individual citizen. Post-genomic research will unravel the link between genes, disease, treatment and the environment and this information will be used to promote health and individualize care. A number of key research issues are identified which need to be addressed in order to realise the delivery of the next generation of EHCR Systems.

2. (Basit Chaudhry, et al,2005) , Systematic Review: Impact of Health Information Technology on Quality, Efficiency, and Costs of Medical Care :

Background: Experts consider health information technology key to improving efficiency and quality of health care. Purpose: To systematically review evidence on the effect of health information technology on quality, efficiency, and costs of health care. Data Sources: The authors systematically searched the English language literature indexed in MEDLINE (1995 to January 2004), the Cochrane Central Register of Controlled Trials, the Cochrane Database of Abstracts of Reviews of Effects, and the Periodical Abstracts Database. We also added studies identified by experts up to April 2005.

Study Selection: Descriptive and comparative studies and systematic reviews of health information technology. Data Extraction: Two reviewers independently extracted information on system capabilities, design, effects on quality, system acquisition, implementation context, and costs. Data Synthesis: 257 studies met the inclusion criteria. Most studies addressed decision support systems or electronic health records. Approximately 25% of the studies were from 4 academic institutions that implemented internally developed systems; only 9 studies evaluated multifunctional, commercially developed systems. Three major benefits on quality were demonstrated: increased adherence to guideline-based care, enhanced surveillance and monitoring, and decreased medication errors. The primary domain of improvement was preventive health. The major efficiency benefit shown was decreased utilization of care. Data on another efficiency measure, time utilization, were mixed. Empirical cost data were limited. Limitations: Available quantitative research was limited and was done by a small number

of institutions. Systems were heterogeneous and sometimes incompletely described. Available financial and contextual data were limited.

Conclusions: Four benchmark institutions have demonstrated the efficacy of health information technologies in improving quality and efficiency. Whether and how other institutions can achieve similar benefits, and at what costs, are unclear.

3. (Tim Scott,2005), Kaiser Permanente's experience of implementing an electronic medical record: a qualitative study :

Objective To examine users' attitudes to implementation of an electronic medical record system in Kaiser Permanente Hawaii. Design Qualitative study based on semi structured interviews. Setting Four primary healthcare teams in four clinics, and four specialty departments in one hospital, on Oahu, Hawaii. Shortly before the interviews, Kaiser Permanente stopped implementation of the initial system in favor of a competing one.

Participants Twenty six senior clinicians, managers, and project team members. Results Seven key findings emerged: users perceived the decision to adopt the electronic medical record system as flawed; software design problems increased resistance; the system reduced doctors' productivity, especially during initial implementation, which fuelled resistance; the system required clarification of clinical roles and responsibilities, which was traumatic for some individuals; a cooperative culture created trade-offs at varying points in the implementation; no single leadership style was optimal—a participatory, consensus-building style may lead to more effective adoption decisions, whereas decisive leadership could help resolve barriers and resistance during implementation; the process fostered a counter climate of conflict, which was resolved by withdrawal of the initial system.

Conclusions Implementation involved several critical components, including perceptions of the system selection, early testing, adaptation of the system to the larger organization, and adaptation of the organization to the new electronic environment. Throughout, organizational factors such as leadership, culture, and professional ideals played complex roles, facilitating and hindering implementation at various points. A transient climate of conflict was associated with adoption of the system.

4. (Dave Garets & Mike Davis,2005) , Electronic Patient Records EMRs and EHRs

Whether you say EMR or EHR is more than a matter of semantics, electronic medical records (EMRs) and electronic health records (EHRs) are not the same thing. The acronyms represent entirely different concepts, so insisting that they're used correctly is more than quibbling over words. Unless you are fairly well versed in advanced clinical information technologies, you are probably confused, because the press, vendors, government officials and industry mavens sometimes unintentionally use the terms incorrectly. Particularly galling are excuses from people who know the difference but use the terms interchangeably, saying "Well, that's the way the world seems to be heading" or "the horses are already out of the barn" or "I know better, but my editors have decided to call both concepts EHR." Unfortunately, we did not make up these quotations.

Most care delivery organization (CDO) decision makers, clinicians, legislators, bureaucrats and members of the press are *not* experts in healthcare IT. If they are observant, however, and read the unending press releases that attempt to pass for news, they know that the latest rage is regional healthcare information organizations (RHIOs) purporting to share summary information (EHRs) from patient records (EMRs). But then

somebody in authority calls both things by the same name, and confusion reigns. Bad decisions get made because people are not talking about the same thing when they use the acronyms.

5. (Haslina Mohd, et al,2005), Acceptance Model of Electronic Medical Record

This paper discusses acceptance issues of Electronic Medical Record System (EMR), particularly in Malaysia. A detailed overview of EMR and its benefits are firstly discussed. A number of acceptance models are scrutinized. Then factors affecting EMR acceptance are put forward. Finally, before proposing an EMR acceptance model, an instrument formed by adapting and then finding its factors loading is presented.

6. (David Blumenthal, et al,2007), Information Technology Comes to Medicine :

In this report, we seek to clarify some of the issues that are central to current discussions about HIT, focusing on topics critical to physicians ,patients, policymakers, and managers. For HIT experts, however, a word of caution is in order. This report is intended for an audience of general physicians who have, as yet, little or no direct experience with the ravels and, yes, frustrations, of HIT as it affects their daily work. HIT cognoscenti, therefore, will find that many topics are not pursued here in detail. To reach its intended audience, the report also adopts a purposely detached tone toward the benefits and risks associated with HIT. To some of its advocates, this tone may seem to deny what many regard as its indisputable value. That is not our intent. Rather, we recognize that the benefits and costs of HIT are multiple and complex and that the evidence supporting them is evolving. The report addresses five questions: What exactly is HIT? What do we know of its benefits and risks? How prevalent is its use at the current

time? What are policymakers doing to encourage or manage its dissemination? And what does the future hold for HIT in U.S. medicine?

7.(*Boonchai Kijsanayotin, et al,2008),* Factors influencing health information technology adoption in Thailand's community health centers: Applying the UTAUT model :

Background: One of the most important factors for the success of health information technology (IT) implementation is users' acceptance and use of that technology. Thailand has implemented the national universal healthcare program and has been restructuring the country's health IT system to support it. However, there is no rational data available regarding the acceptance and use of health IT in many healthcare facilities, including community health centers (CHCs). This study employed a modified Unified Theory of Acceptance and Use of Technology (UTAUT) structural model, to understand factors that influence health IT adoption in community health centers in Thailand and to validate this extant IT adoption model in a developing country health care context. *Methods:* An observational research design was employed to study CHCs' IT adoption and use. A random sample of 607 regionally stratified CHC's from a total of 9806 CHCs was selected. Data collection was conducted using a cross-sectional survey by means of self administered questionnaire with an 82% response rate. The research model was applied using the partial least squares (PLS) path modeling.

Results: The data showed that people who worked in CHCs exhibited a high degree of IT acceptance and use. The research model analyses suggest that IT acceptance is influenced by performance expectancy, effort expectancy, social influence and voluntariness. Health IT use is predicted by previous IT experiences, intention to use the system, and

facilitating conditions. *Conclusions:* Health IT is pervasive and well -adopted by CHCs in Thailand. The study results have implications for both health IT developmental efforts in Thailand and health informatics research. This study validated the UTAUT model in the field context of a developing country's healthcare system and demonstrated that the PLS path modeling works well in a field study and in exploratory research with a complex model.

8. (*Chiang, et al,2008* , Adoption and Perceptions of Electronic health Record Systems by ophthalmologists: An American Academy of Ophthalmology Survey

Objective: To assess the current state of electronic health record (EHR) use by ophthalmologists, including adoption rate and user satisfaction. *Design:* Population-based, cross-sectional study. *Participants:* A total of 592 members of the American Academy of Ophthalmology (AAO) participated. *Methods:* A total of 3796 AAO members were randomly selected on the basis of geography and solicited to participate in a study of EHR adoption. Among those solicited, 392 members completed a web-based version of the survey and 200 members completed a telephone-based version. The survey included sections assessing the current level of EHR adoption, the value of various EHR features, the practice demographics, and, for participants with an EHR, the details of their system. Responses were collected and analyzed using univariate statistical tests.

Main Outcome Measures: Current adoption rate of EHRs, user satisfaction with EHRs, and importance of various EHR features to both users and nonusers. *Results:* Overall, 12% of the practices surveyed had already implemented an EHR, 7% were in the process of doing so, and another 10% had plans to do so within 12 months. Both EHR users and

nonusers rated the same EHR features as having the most value to their practices, and the 2 groups rated options for simplifying the HER selection process similarly. Among those with an EHR in their practice, 69% were satisfied or extremely satisfied with their system, 64% reported increased or stable overall productivity, 51% reported decreased or stable overall costs, and 76% would recommend an EHR to a fellow ophthalmologist.

Conclusions: The adoption rate of EHRs by ophthalmology practices is low but comparable to that seen in other specialties. The satisfaction of those ophthalmologists already using an EHR is high. Because EHRs are part of the rapidly changing health information technology marketplace, the AAO Medical Information Technology Committee is planning to update these results on a regular basis.

9. (Wills, et al.,2008), Examining healthcare professional's acceptance of electronic medical records using UTAUT

With the growing demand for digital information in health care, the electronic medical record (EMR) represents the foundation of health information technology. It is essential, however, in an industry still largely dominated by paper-based records, that such systems be accepted and used. This research evaluates registered nurses, certified nurse practitioners and physician assistants' acceptance of EMR's as a means to predict, define and enhance use. The research utilizes the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical model, along with the Partial Least Square (PLS) analysis to estimate the variance. Overall, the findings indicate that UTAUT is able

to provide a reasonable assessment of health care professionals' acceptance of EMR's with social influence a significant determinant of intention and use.

10.(Mary Elizabeth Morton ,2008), Use and Acceptance of an Electronic Health Record: Factors Affecting Physician Attitudes

The benefits of using electronic health records (EHRs) are well-documented; however, a number of implementation barriers have impeded their widespread use. The literature provides evidence of failed clinical system implementations, due to lack of adoption by users. Health care organizations must be prepared to anticipate and manage changes that will accompany implementation of a new information system. As the key coordinator and provider of patient care, physician acceptance of an EHR application will determine the overall success of a product's implementation. The objective of this study was to determine the individual characteristics and socio -technical factors that may contribute to physician acceptance of an EHR. A hypothesized causal model grounded in Diffusion of Innovations theory and the Technology Acceptance Model was developed using case study and survey methods, and was tested using structural equation modeling (SEM). An online survey was distributed to 802 faculty, fellow and resident physicians in an acute care teaching institution in the southeastern United States. Overall response rate was 29.8%. The model variables explained over 73% of the variance in EHR attitude and acceptable model fit was achieved. Individual physician characteristics did not correlate with attitudes in this population. Factors contributing to physician acceptance include: management support, physician involvement in selection and implementation, perceptions of the EHR's impact on physician autonomy, doctor-patient relationship,

perceived ease of use and perceived usefulness. Study participants also expressed concerns about perceptions of the EHR's potential negative impact on clinical workflow and efficiency. Adequate training was not a significant predictor of attitudes.

Significant contributions of this study include development of an HER Acceptance Model for assessing physician attitudes prior to EHR implementation. Other healthcare institutions may find this framework useful for assessing EHR readiness. The findings may aid software developers in designing products to accommodate multiple clinical specialties and user skill levels. The results provide empirical support for a theory about the impact of socio -technical factors on physician attitudes about EHR adoption.

11. (Furukawa, et al.,2008), Health information technology

(IT) is regarded as an essential tool to improve patient safety, and a range of initiatives to address patient safety are under way. Using data from a comprehensive, national survey from HIMSS Analytics, we analyzed the extent of health IT adoption for medication safety in U.S. hospitals in 2006. Our findings indicate wide variation in health IT adoption by type of technology and geographic location. Hospital size, ownership, teaching status, system membership, payer mix, and accreditation status are associated with health IT adoption, although these relationships differ by type of technology. Hospitals in states with patient safety initiatives have greater adoption rates

12. (Ashish Jha,et al.,2009), Use of Electronic Health Records in U.S. Hospitals

Background Despite a consensus that the use of health information technology should lead to more efficient, safer, and higher-quality care, there are no reliable estimates of the prevalence of adoption of electronic health records in U.S. hospitals.

Methods We surveyed all acute care hospitals that are members of the American Hospital Association for the presence of specific electronic-record functionalities. Using a definition of electronic health records based on expert consensus, we determined the proportion of hospitals that had such systems in their clinical areas. We also examined the relationship of adoption of electronic health records to specific hospital characteristics and factors that were reported to be barriers to or facilitators of adoption.

Results On the basis of responses from 63.1% of hospitals surveyed, only 1.5% of U.S. hospitals have a comprehensive electronic-records system (i.e., present in all clinical units), and an additional 7.6% have a basic system (i.e., present in at least one clinical unit). Computerized provider-order entry for medications has been implemented in only 17% of hospitals. Larger hospitals, those located in urban areas, and teaching hospitals were more likely to have electronic-records systems. Respondents cited capital requirements and high maintenance costs as the primary barriers to implementation, although hospitals with electronic-records systems were less likely to cite these barriers than hospitals without such systems.

Conclusions The very low levels of adoption of electronic health records in U.S. hospitals suggest that policymakers face substantial obstacles to the achievement of health care performance goals that depend on health information technology. A policy strategy

focused on financial support, interoperability, and training of technical support staff may be necessary to spur adoption of electronic-records systems in U.S. hospitals.

13.(Esther Hing, and Chun-Ju Hsiao,2010) Electronic Medical Record Use by Office-based Physicians and Their Practices: United States

Objectives—This report presents information on the adoption of electronic medical records (EMRs) by office-based physicians in 2007. Percentages of medical practices and physicians within practices using EMR systems are presented by selected physician and practice characteristics. *Methods*—Data from the physician induction interviews of the 2007 National Ambulatory Medical Care Survey (NAMCS) are presented. NAMCS is based upon a national probability sample of nonfederal office-based physicians who saw patients in an office setting. Sample data were weighted to produce national estimates of office-based physician characteristics and their practices. *Results*—In 2007, 34.8 percent of office-based physicians reported using any EMR (all electronic or partially electronic medical record) system, which represented a 19.2 percent increase since 2006 and a 91.2 percent increase since 2001. Starting in 2005, NAMCS included additional questions about features of electronic record systems making it possible to categorize systems as basic or fully functional using similar definitions developed by health information technology (HIT) experts. Fully functional systems are a subset of basic systems. Some systems do not meet the requirements. In 2007, 11.8 percent of physicians had systems meeting the criteria of basic systems (95% CI: 9.6–13.9), unchanged from 2006 (10.5 percent). The percentage of office-based physicians with systems meeting the definition of fully functional (3.8 percent, 95% CI: 2.6–5.0) was similar to the 2006 percentage (3.1 percent). Physicians in practices with 11

or more physicians were most likely to use any EMR system (74.3 percent), whereas physicians in solo practice were least likely to use EMRs (20.6 percent). EMR use was higher among physicians in multi-specialty practices (52.5 percent) than in solo or single-specialty practices (30.3 percent). EMR use was inversely associated with physician age. If those without EMR systems in 2007 with definite plans to install one actually do so, 53.6 percent of physicians will have some type of an EMR system in 2010.

14.(Fan-Yun Pai ,Kai-I Huang,2010) Applying the Technology Acceptance Model to the introduction of healthcare information systems

With the rapid development of information systems and advances in healthcare technology paired with current concerns arise over patients' safety and how to cure them efficiently, the healthcare information systems are attracting the attention of more and more people. The purpose of this study is to propose a conceptual model, appropriate for the intention to use healthcare information systems, by adopting the system, service, and information qualities covered in the Information System Success Model proposed by DeLone and Mclean [1] as the external variables and integrating the three dimensions of perceived usefulness, perceived ease of use, and intention to use—referred to in Venkatesh and Davis' updated Technology Acceptance Model, TAM[2]. This study first analyzes relevant researches on the intention to use such systems as the basis for the questionnaire design, then conducts questionnaire survey among district hospital nurses, head directors, and other related personnel. After the questionnaires are collected, SEM is used to analyze the data. The analysis shows that the proposed factors positively influence users' intention to use a healthcare system. Information, service and system quality influence user's intention the mediating constructs, perceived usefulness and

perceived ease-of-use. Managerial implications are provided accordingly. Suggestions for introducing healthcare information system are then provided as well.

15.(*Joshua R. Vest,2010),* More than just a question of technology: Factors related to hospitals' adoption and implementation of health information exchange

Introduction: The provisions of the American Recovery & Reinvestment Act increased the likelihood of more widespread health information exchange (HIE), the electronic transfer of patient-level information between organizations, by essentially mandating the use of electronic health record systems. While important, the sparse body of research on HIE efforts and anecdotal reports indicate the barriers to HIE adoption and implementation include factors beyond simply the presence or absence of a specific technology. *Methods:* This paper examines those technological, organizational, and environmental factors that are associated with both HIE adoption and implementation in a sample of 4830 U.S. hospitals. Factors associated with adoption and implementation were modeled using random-intercept logistic regression. *Results:* Consistent with a perspective that adoption and implementation are different phenomena, many factors associated with an increased odds of adoption, were unassociated with implementation and vice versa. Non-profit status, public hospitals, more live and operation applications, more emergency room visits, network membership, and the presence of physician portals all increased hospitals' odds of HIE adoption. However, only network membership increased the odds of HIE implementation, whereas competition decreased those odds significantly. *Conclusions:* This study agreed with earlier case-studies and anecdotal reports that factors beyond technology were important to both adoption and implementation. While current U.S. policy on healthcare information technology

adoption focuses on technological barriers, many other non-technological factors may ultimately hinder effective HIE.

16.(Cushman, et al.,2010), Ethical, legal and social issues for personal health records and applications

Robert Wood Johnson Foundation's Project Health design included funding of an ethical, legal and social issues (ELSI) team, to serve in an advisory capacity to the nine design projects. In that capacity, the authors had the opportunity to analyze the personal health record (PHR) and personal health application (PHA) implementations for recurring themes. PHRs and PHAs invert the long-standing paradigm of health care institutions as the authoritative data-holders and data-processors in the system. With PHRs and PHAs, the individual is the center of his or her own health data universe, a position that brings new benefits but also entails new responsibilities for patients and other parties in the health information infrastructure. Implications for law, policy and practice follow from this shift. This article summarizes the issues raised by the first phase of Project Health Design projects, categorizing them into four topics: privacy and confidentiality, data security, decision support, and HIPAA and related legal-regulatory requirements. Discussion and resolution of these issues will be critical to successful PHR/PHA implementations in the years to come.

17**. (*CraigE.Kuziemskya,*, LaraVarpiob,2011),* A model of awareness to enhance our understanding of interprofessional collaborative care delivery and health information system design to support it:**

Background: As more healthcare delivery is provided by collaborative teams there is a need for enhanced design of health information systems (HISs) to support collaborative care delivery. The purpose of this study was to develop a model of the different types of awareness that exist in interprofessional collaborative care (ICC) delivery to inform HIS design support ICC. *Methods:* Qualitative data collection and analysis was done. The data sources consisted of 90 h of non-participant observations and 30 interviews with nurses, physicians, medical residents, volunteers, and personal support workers. *Results:* Many of the macro-level ICC activities (e.g. morning rounds, shift change) were constituted by micro-level activities that involved different types of awareness. We identified four primary types of ICC awareness: patient, team member, decision making, and environment.

Each type of awareness is discussed and supported by study data. We also discuss's implication of our findings for enhanced design of existing HISs as well as providing insight on how HISs could be better designed to support ICC awareness.

Conclusion: Awareness is a complex yet crucial piece of successful ICC. The information sources that provided and supported ICC awareness were varied .The different types of awareness from the model can help us understand the explicit details of how care providers communicate and exchange information with one another. Increased understanding of ICC awareness can assist with the design and evaluation of HISs to support collaborative activities.

18.(Tenforde, Et al.,2011) , The Value of Personal Health Records for Chronic Disease Management: What Do We Know?

BACKGROUND AND OBJECTIVES: Electronic personal health records (PHRs) allow patients access to their medical records, self-management tools, and new avenues of communication with their health care providers. They will likely become a valuable component of the primary care Patient-centered Medical Home model. Primary care physicians, who manage the majority of chronic disease, will use PHRs to help patients manage their diabetes and other chronic diseases requiring continuity of care and enhanced information flow between patient and physician. In this brief report, we explore the evidence for the value of PHRs in chronic disease management.

METHODS: We used a comprehensive review of MEDLINE articles published in English between January 2000 and September 2010 on personal health records and related search terms. RESULTS: Few published articles have described PHR programs designed for use in chronic disease management or PHR adoption and attitudes in the context of chronic disease management. Only three prospective randomized trials have evaluated the benefit of PHR use in chronic disease management, all in diabetes care. These trials showed small improvements in some but not all diabetes care measures. All three trials involved additional interventions, making it difficult to determine the influence of patient PHR use in improved outcomes CONCLUSIONS: The evidence remains sparse to support the value of PHR use for chronic disease management. With the current policy focus on meaningful use of electronic and personal health records, it is

crucial to investigate and learn from new PHR products so as to maximize the clinical value of this tool.

2.4 Study Contribution to Knowledge

Previous studies discussed different factors that affected the electronic health record systems. However, few studies suggested a comprehensive model similar to the model in this study that takes into consideration some key factors in the system. Moreover, the model suggested by the researcher focuses on the main factors. Finally, the sample of the study were private hospitals in Amman which represent cases from chosen population in Jordan.

Chapter Three:

Methods and Procedures

3.1 Introduction

This chapter discusses the methods used in this study to answer research questions and test the hypotheses depending on several statistical methods. This chapter is divided into five sections: Study Methodology, Study Population and Sample, Study Tools and Data Collection, Statistical Treatment, finally, Reliability and Validity.

3.2 Study Methodology

This study used both descriptive and analytical analysis. Descriptive study includes data collected from previous related works and literature reviews. These resources were used to develop the theoretical model of this study. Furthermore, statistical techniques were used for empirical analysis, and a survey was designed to collect data from the population of the study, who were IT mangers and employees in private hospitals in Amman.

3.3 Study Population and Sample

Sampling is important for as budget and time restrictions prevent us from surveying the whole population. Sampling also gives a higher level of credibility and fast results (Al-Bakri, 2009). The population in the current research is taken from private hospitals in Amman. Private hospitals in Amman have different sizes (hospitals sizes are measured by the number of beds). The sample chosen for this study represent a large number of the population. I made a visit to the Ministry of Health and asked for the full list of private hospitals in Jordan, which were 38 hospital chosen for the survey .But

when we distributed the questionnaires (2 for each hospital) 5 hospitals apologized and did not answer the questionnaire for personal reasons, another 6 questionnaires were not qualified for the research. In the end 30 hospitals were put for the survey with the total of 60 questionnaires which were given to hospital managers and head managers of IT departments.

3.4 Study Tools and Data Collection

To gain deeper understanding of the related aspects in hospitals, current research is conducted with both qualitative and quantitative approaches. This current research is conducted by the following stages:

Stage 1. Literature review,examines the findings of other researchers and authors who have extensive experience. This stage discusses a number of different issues.

Stage 2. The quantitative approach includes a survey on a sample of IT managers. The survey is conducted in this research to explore the perception, of IT mangers in private hospitals in Amman. The purpose of the survey is to produce quantitative descriptions of some aspects and issues of the study population. The questionnaire is developed and based on literature review, and will be refined with results and information collected from the previous stage of the research. The survey will be pre-tested for its validity and reliability. A pilot test will be conducted to check the validity of the questionnaire, eliminating any uncertainty, and making appropriate changes according to respondents' suggestions.

Stage 3. Data coding and analysis includes presentations, hypothesis testing, and result analysis. Various quantitative statistics of methods such as factor analysis, T-test analysis

of variance and correlation will be employed in the survey data. Statistical techniques ,relationships between variables, and the Statistical Package for Social Science 'SPSS' (v19) will be used to evaluate and perform all the analysis to test the hypotheses.

3.5 Statistical Treatment

After collecting data and studying the responses, the researcher used the Statistical Package for Social Sciences SPSS (v19) to analyze data. The researcher used a suitable statistical treatment for each question and hypothesis depending on the following tests:

- ✓ Cronbach Alpha (α) was used to test Reliability.
- ✓ Percentage and Frequency to describe the sample.
- ✓ Arithmetic Means and Standard Deviations to answer the study questions.
- ✓ The T-test and the ANOVA table were used to measure the impact of the user characteristics on the usage level
- ✓ Simple Linear and Multiple Regression analysis with (F) test
- ✓ Relative importance, that is assigned using:

$$Class\ Interval = \frac{5-1}{3} = \frac{4}{3} = 1.33$$

$$Class\ Interval = \frac{Maximum\ class - Minimum\ Class}{Number\ of\ level}$$

The Low degree is less than 2.33

The Mediam degree is from 2.33 – 3.66

The High degree is from 3.67 and above.

3.6 Validity and Reliability

(A) Validation

To test for survey clarity and coherency, a macro review covering all research components was performed by academic reviewers - from Jordanian Universities - specialized in business, information technology and statistics. Therefore, some items were added based on their recommendations while some others were modified. The survey was reviewed by a total of (7) academic reviewers and the overall percentage of response was 100%. Please see appendix "B" for the list of academic arbitrators.

(B) Reliability

To test the survey reliability, Cronbach Alpha (α) analysis was used to measure internal consistency. A minimum acceptable level (Alpha ≥ 0.65)was suggested and adopted by (Revelle &Zinbarg, 2009) . Results show that overall Cronbach Alpha (α) =equaled (97.83), and the results of Cronbach Alpha (α) are shown in the following Table (1).

Num	Variable	Alpha
1	The adoption of EHR	.869
2	Technological factors	.781
3	Financial factors	.710
4	Employees perception	.674
5	Security issues	.722
All Survey		0.89

Table (1) *Reliability of survey Dimensions*

Chapter Four:

Results and Hypotheses Testing

4.1 Introduction

Based on the previous research framework, this chapter presented and described the statistical analysis results for the research questions and the research hypotheses. The data analysis included a descriptive analysis using Means and Standard Deviations for all the questions of the study; ANOVA ,in addition to Multiple and Simple Linear Regression analysis were also used for empirical analysis .

4.2Study hypothesis testing

ANOVA was used to see if there are any differences between the factors, and the results were:

Ho1: There is no significant statistical effect of technological factors and the adoption of the EHR in private hospitals in Amman.

Table (11): results of the differences between the technological factors *and the adoption of EHR in private hospitals in Amman using ANOVA*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.257	1	3.257	6.824	.011(a)
	Residual	27.678	58	.477		
	Total	30.935	59			

Predictors: (Constant), technological factors

Dependent Variable: adoption of HER

* The impact is significant at level ($\alpha \leq 0.0\ 1$)

By looking at Table (11) it is clear that the absolute value of F calculated (6.824) which is more than F tabulated at level ($\alpha \leq 0.01$). This indicates that the first hypothesis is valid. Therefore, the null sub-hypotheses were refused and the alternative sub-hypotheses were accepted and therefore and the result is

There is a significant statistical effect of technological factors and the adoption of EHR in private hospitals in Amman.

Ho2: There is no significant statistical effect of financial factors on EHR adoption in private hospitals in Amman.

Table (12): The results show of the differences between financial factors and the adoption of EHR in private hospitals in Amman using ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.165	1	3.165	6.610	.013(a)
	Residual	27.770	58	.479		
	Total	30.935	59			

Predictors: (Constant), financial factors
Dependent Variable: adoption of HER
* The impact is significant at level ($\alpha \leq 0.01$)

By looking at table (12) we can see that the absolute value of F calculated (6.610) which is more than F tabulated at level ($\alpha \leq 0.01$). This indicates that the second hypothesis is valid. Therefore, the null sub-hypotheses were refused and the alternative

There is a significant statistical effect of financial factors on EHR adoption in private hospitals in Amman.

sub-hypotheses were accepted m therefore the result is

Ho3: There is no significant statistical effect of the employee's perception on EHR adoption in private hospitals in Amman.

Table (13): The results show of the differences between the resistance to change and the adoption of EHR in private hospitals in Amman using ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.444	1	1.444	2.839	.097(a)
	Residual	29.491	58	.508		
	Total	30.935	59			

a Predictors: (Constant), the resistance to change
b Dependent Variable: adoption of HER

* The impact is significant at level ($\alpha \leq 0.0\ 1$)

By looking to table (13) we can see that the absolute value of F calculated (2.839) which is less than F tabulated at level ($\alpha \leq 0.01$). This indicates that the third hypothesis is valid. Therefore, the null sub-hypotheses were accepted and the alternative sub-hypotheses were refused therefore and the result is

There is no significant statistical effect of the resistance to change on EHR adoption in private hospitals in Amman.

Ho4: There is no significant statistical effect of the security issues on EHR adoption in private hospitals in Amman.

Table (14): The results show of the differences between security issues *and the adoption EHR in private hospitals in Amman using ANOVA*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.488	1	.488	.929	.339(a)
	Residual	30.447	58	.525		
	Total	30.935	59			

Predictors: (Constant), security issues
Dependent Variable: adoption of HER

* The impact is significant at level ($\alpha \leq 0.0\ 1$)

By looking to Table (14) it is clear that the absolute value of F calculated (.929) which is less than F tabulated at level ($\alpha \leq 0.0\ 1$). This indicates that the third hypothesis is valid. Therefore, the null sub-hypotheses were accepted and the alternative sub-hypotheses were refused therefore and the result is

There is no significant statistical effect of security issues on EHR adoption in private hospitals in Amman.

4.3 Coefficient of determination

1. Technological factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.324(a)	.105	.090	.69081

a Predictors: (Constant), technological factors

From the table ( ) the R coefficient between technological factors and the adoption of EHR in private hospitals in Amman , which indicate a significant effect of the predicting variables (technological factors) on the dependent variables (adoption of EHR). The R2 value = .105, which means part of the variance of adoption of EHR was explained by technological factors.

2. Financial factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.320(a)	.102	.087	.69195

a Predictors: (Constant), financial factors

From the table ( ) the R coefficient between financial factors and the adoption of EHR in private hospitals in Amman .320 which indicate a significant effect of the predicting variables (financial factors) on the dependent variables (adoption of EHR). The R2 value = .102, which means part of the variance of adoption of EHR was explained by financial factors.

3. Resistance to change

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.216(a)	.047	.030	.71307

a Predictors: (Constant), resistance to change

From the table ( ) the R coefficient between employee's perception and the adoption of EHR in private hospitals in Amman which indicate a no significant effect of the predicting variables (employee's perception) on the dependent variables (adoption of EHR). The R2 value = .047, which means part of the variance of adoption of EHR was explained by employees perception

4. Security issues

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.126(a)	.016	-.001	.72454

a Predictors: (Constant), security issues

From the table ( ) the R coefficient between security issue and the adoption of EHR in private hospitals in Amman .126, which indicate a no significant effect of the predicting variables (security issue) on the dependent variables (adoption of EHR). The R2 value = .0.016, which means part of the variance of adoption of EHR was explained by security issue.

4.4 level of importance for the factors

Table (15) level of importance for the applying of electronic systems in the medical record which were as the following:

Items	Means	STD	Level if importance	Level of importance
Patients General Information	3.87	1.29	1	High
Medication Lists	3.70	1.33	2	High
Physician Notes	3.37	1.39	3	Medium
Discharge Summaries	3.37	1.31	4	Medium
Advanced Directives (i.e. DNR)	2.73	1.38	5	Medium
Complaints	2.67	1.41	6	Medium
Nursing Assessments	1.90	1.12	7	Low

By looking at table (15) it is noticeable that means ranged between (1.9- 3.87), the highest mean was for “Patients General Information” with means of (3.87) and STD (1.29), the lowest mean was for “Nursing Assessments” with means of (1.90) and STD (1.12). All mean levels were above medium except for the level (7) which was the lowest.

Table (16): level of importance for the applying electronic systems in the presentation of the following results

Items	Means	STD	Level if importance	Level of importance
Lab Reports	4.30	1.01	1	High
Radiology Reports	3.77	1.32	2	High
Other Diagnostic Test Results	3.12	1.49	3	Medium
Radiology Images	2.73	1.47	4	Medium
Consultant Reports	2.57	1.42	5	Medium

By looking at table(16)we can notice that means have ranged between (2.57-4.30), the highest mean was for “Lab Reports” with means of (4.30) and STD (1.01), where the lowest mean was for the item “Consultant Reports ” with means of (2.57) and STD (1.42). All mean levels were above medium

Table (17): level of importance for the applying of electronic systems in the band encoding

Items	Means	STD	Rank	Level
Pharmaceutical administration	2.60	1.26	1	Medium
Tracking pharmaceuticals	2.47	1.35	2	Medium
Laboratory specimens	2.40	1.03	3	Medium
Patient's ID	2.37	0.96	4	Medium
Supply chain management	2.30	0.91	5	Low

In table (17) it is noticeable that means ranged between (2.30 – 2.60), the highest mean was for "Pharmaceutical administration " with means of (2.60) and STD (1.26), where the lowest mean was for "Supply chain management " with means of (2.30) and STD (0.91). All mean levels were above medium, except for rank5 which was in the lowest level.

Table (18): level of importance for the first factor economic entrained (financial)

Items	Means	STD	*level if importance*	*level of importance*
The amount of capital needed to purchase and implement an EHR	2.60	0.62	1	Medium
Uncertainty about the return on investment (ROI) from an EHR	2.20	0.84	2	Medium
Concerns about the ongoing cost of maintaining an EHR system	1.73	0.63	3	Medium

In table(18) it is noticeable that means ranged from(1.73- 2.60), the highest mean was for “level 1 ” with means of (2.60) and STD (0.62), and the lowest mean was for level 3 ” with means of (1.73) and STD (0.63). All mean levels were above medium.

Table (19): level of importance for the first factor technological constraint

Items	Means	STD	*level if importance*	*level of importance*
Lack of adequate IT staff	2.13	0.77	1	Medium
Finding an EHR system that meets your organization's needs	1.83	0.64	2	Medium
Concerns about a lack of future support from vendors for upgrading and maintaining the system	1.73	0.63	3	Medium
Lack of capacity to select, contract for, and implement an HER	1.43	0.56	4	Low

By looking at table (19) it is noticeable that means ranged from(1.43- 2.13) The highest mean was for " level 1 " with means of (2.13) and STD (0.77). The lowest mean was for "level4 "with means of (1.43) and STD (0.56). All mean levels were above medium except the level (4) which was the lowest.

Table (20): level of importance for the change resistance

Items	Means	STD	Level of importance	Level of importance
Resistance to implementation from physicians	2.47	0.81	1	Medium
Resistance to implementation from other providers	2.23	0.77	2	Medium
Disruption in clinical care during implementation	1.57	0.56	3	Low

In table (20) it is noticeable that means ranged from(1.57-2.47), the highest mean was for " level 1 " with means of (2.47) and STD (0.81), The lowest mean was for the "level 3 " with means of (1.57) and STD (0.56). All mean levels were above medium except for level(3) which was the lowest.

Table (21): level of importance for the privacy and security problems

Items	Means	STD	Level if importance	Level of importance
Concerns about illegal record tampering or “hacking”	1.73	0.45	1	Medium
Concerns about the legality of donating a system to associated physician	1.50	0.57	2	Low
Concerns about inappropriate disclosure of patient information	1.50	0.50	3	Low

Looking at table (21) it is noticeable that means ranged (1.73) ,the highest means was for “ level 3” with means of (1.73) and STD (0.45), the lowest mean was for the “level 2 ” with means of (1.50) and STD (0.50). All mean levels were above medium except for levels (1and 2) which were the lowest.

Chapter Five:

Conclusion & Recommendations

5.1 Conclusions

In this study, the researcher examined a number of questions and suggested some hypotheses and the study came out with results that may contribute to increase EHR system adoption. The main results are:

- ✓ There is a significant statistical effect of finical factors on EHR system adoption at level ($\alpha \leq 0.01$).

  This result indicates that finical factors affect the adoption of EHR systems which is the most important barrier that limits the adoption of EHR systems.
- ✓ There is a significant statistical effect of technological factors on EHR system adoption at level ($\alpha \leq 0.01$).

  This result indicates that technological factors affect the adoption of EHR systems which is one of the most important barriers that limit the adoption of EHR systems.
- ✓ There is no significant statistical effect of change resistance on EHR system adoption at level ($\alpha \leq 0.01$).This result indicates that change resistance is not affective on the adoption of EHR systems and it is not one of the most important barriers that limit the adoption of EHR systems.
- ✓ There is no significant statistical effect of security issues on EHR system adoption at level ($\alpha \leq 0.01$).This result indicates that the security issue is not affective on the adoption of EHR systems and it is not one of the most important barriers that limit the adoption of EHR systems.

5.2 Recommendations

Based on previous results and conclusions, the following recommendations might help in enhancing EHR systems adaption:

1. Building a data warehouse in order to make a strong integration among all these hospitals.
2. Increasing the budget to overcome the finical barriers that affect EHR systems .
3. Running and maintaining EHR systems to deal with any error .
4. Holding training courses for mangers and chief executive officers to increase their knowledge about the return on investment for the adoption of EHR systems.
5. Improving the IT Infrastructure to overcome technological barriers.

References:

1. A. Michael Froomkin et al (2010) ,Ethical, legal and social issues for personal health records and applications Reid Cushman a Journal of Biomedical Informatics 43 (2010) S51–S55

2. Ashish K. Jha & others (2009),Use of Electronic Health Records in U.S. Hospital april 16, The New England Journal of Medicine

3. Boonchai Kijsanayotina,, (2009) Supasit Pannarunothaib, Stuart M. Speediec ,Factors influencing health information technology adoption in Thailand's community health centers: Applying the UTAUT model international journal of medical informatics 78 404–416

4. Boonstra and Broekhuis (2010) Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions Albert Boonstra Manda Broekhuis BMC Health Services Research 10:231

5.Chau, P. Y. K. (1996). An empirical assessment of a modified technology acceptance model, Journal of Management Information Systems, 13(2), 185-204.

6. Chau, P. Y. K., & Hu, P. J. (2001). Information technology acceptance by individual professionals: A model comparison approach. Decision Sciences, 32(4), 699-719.

7. Chau, P. Y. K., & Hu, P. J. (2002). Investigating healthcare professionals' decisions to accept telemedicine technology: An empirical test of competing theories. Information & Management, 39(4), 297-311.

8. CraigE Kuziemskya Lara Varpiob (2011), A model of awareness to enhance our understanding of inter professional collaborative care delivery and health information system design to support it international journal of medical informatics

9. Dave Garets and Mike Davis (2005) ,Electronic Patient Records EMRs and EHRs Concepts as different as apples and oranges at least deserve separate names. - Healthcare Informatics

10. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-340.

11. Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Science, 35(8), 982-1003.

12. David Blumenthal, M.D., M.P.P., and John P. Glaser, T h e new engl and journa l o f medicine Information Technology Comes to Medicine Information in practice

13. Esther Hing, M.P.H., and Chun-Ju Hsiao(2010), ,Electronic Medical Record Use by Office-based Physicians and Their Practices: United States, 2007 Division of Health Care Statistics Number 23 n March 31, national health statistics reports

14. Fan-Yun Pai a, , Kai-I Huang(2011) ,Applying the Technology Acceptance Model to the introduction of healthcare information systems Technological Forecasting & Social Change 78 (2011) 650–660

15. Institute of Medicine. (2001). Crossing the quality chasm: A new health system for the 21st century. Washington, DC: National Academy Press.

16. Institute of Medicine. (2003a). Key capabilities of an electronic health record system. Washington, DC: National Academies Press.

17. Institute of Medicine. (2003b). Patient safety: Achieving a new standard for care. Washington, DC: National Academies Press.

18. J Tim Scott et al (2005) Kaiser Permanente's experience of implementing an electronic medical record: a qualitative study BMJ VOLUME 331 3

19. Joshua R. Vest ,More than just a question of technology: Factors related to

hospitals' adoption and implementation of health information exchange international journal of medical informatics 7 9 (2 0 1 0) 797–806

20. Knaup, P. (2007) Electronic Patient Records: Moving from Islands and Bridges towards Electronic Health Records for Continuity of Care. IMIA and Schattauer GmbH

21.Jerome Wang, et al (2006) ,Systematic Review: Impact of Health Information Technology on Quality, Efficiency, and Costs of Medical Care Basit Chaudhry,Annals of Internal Medicine Improving Patient Care.American College of Physicians,

22. Matthew J. Wills,(2008) Examining healthcare professional's acceptance of electronic medical records UTAUT Dakota State University Omar F. El-Gayar, Dakota State University Dorine Bennett, Dakota State University VOL IX, No. 2, 2008 Issues in Information Systems

23. Mark Tenforde,; Anil Jain,; John Hickner ,(2011) The Value of Personal Health Records for Chronic Disease Management: What Do We Know? MAY 2011 • VOL. 43, NO. 5 FAMILY MEDICINE

24. Mary Elizabeth Morton,(2008) Use and Acceptance of an Electronic Health Record: Factors Affecting Physician Attitudes August 2008

25. Michael F. Furukawa, et al (2006) Adoption Of Health Information Technology For Medication Safety In U.S. Hospitals, 2006 States with patient safety initiatives have higher rates of adoption of health IT in hospitals than states without these initiatives.

26. Mohd & Sharifah Mastura Syed Mohamad,(2005) Acceptance Model of Electronic Medical Record , Haslina Journal of Advancing Information and Management Studies, 2(1), June 2005

27. Moore, L. A. (1994). Reaction of medical personnel to a medical expert system for stroke. In J. G. Anderson, C. E. Aydin & S. J. Jay (Eds.), Evaluating health care information systems: Methods and applications (pp. 226-244). Thousand Oaks, CA: SAGE Publications, Inc.

28. Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. Information Systems Research, 2(3), 192-222.

29. Nik Azliza Nik Ariffin, (2008) Electronic Medical Records (EMRs) Practices through a Clinical Microsystem in the Malaysian Government Hospitals Communications of the IBIMA Volume 5, 2008

30. Richard J. Holden a, Ben-Tzion ,(2010) The Technology Acceptance Model: Its past and its future in health care,Karsh a Journal of Biomedical Informatics 43 (2010) 159–172

31. Rogers, E. M. (2003). Diffusion of innovations (5th ed.). New York: Free Press.

32. Rogoski, R. R. (2003). Having it your way. Health Management Technology, 24(5), 12- 16.

33. Shabbir Syed Abdul (2008),The Challenges, problems and strategies of electronic medical records implementation: A case study of an eye hospital from India,

34. Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. Decision Sciences, 27(3), 451-481.

35. Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46(2), 186-204.

36. Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. MIS Quarterly, 24(1), 115-139.

37. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425-478.

38. Wager, K. A. (2002). Information systems development. In K. M. E. LaTour, S. (Ed.), Health information: Concepts, principles and practice (pp. 101-120). Chicago: American Health Information Management Association.

39. Wager, K. A., Ward, D. M., Lee, F. W., White, A. W., Davis, K. S., & Clancy, D. E. (2005). Physicians, patients and EHRs. Journal of the American Health Information Management Association, 76(4), 38-41.

APPENDIXES

Appendix – A – Survey

Questionnaire

Use Of Electronic Health Records in Private Hospital in Amman

Dear manager

The technological progress of various areas of life, including the medical field, was one of the most out standing off the evolution of communications technology and information in the medical field; The accuracy of the information and quick access is extremely important, that it appeared at the end of the beginning of the new millennium an electronic system a special medical records is the Electronic Health Record and its acronym stands for (EHR). Despite the importance of this system , it is still not fully implemented either in Jordan or in most countries of the world
The researcher asked questions in this questionnaire from which to measure the degree . of use of information technology in Jordanian hospitals, as well as identifying the .obstacles that prevent the use of this technology in these hospitals

So I hope you will answer to each paragraph of this resolution, accuracy and objectivity of all, note that the information that you will be making them, will be treated confidentially and will only be used for research purposes only.

Thank you very much

Maha A.AlAbdallah

MEU

Mobile: 0777041237 Dr.maha2008@hotmail.com

Personal data to the doctor: √ Check the answer when it deems appropriate select one answer only

Gender □ male □ female

Medical specialization

Primary Care □surgical □medical □ □Other

Job Site

□ General Manager of the hospital

□director of information technology □ Director (jurisdiction) □

□Medical Director of the Department of Nursing

□ Site and other functional

Age

□ less than35 □ 35 - less than 45 □ 45 - less than 55 □ 55 or more

Hospital data: √ Check the answer when it deems appropriate (select one answer only)

Number of beds

□ less than 100 □ 100 and less than 200 □ less than 300 □ more than 300

Number of Doctors

□less than 10 □ 10 to less than 20 □ 20 to less than 30 □ more than 300

Numebrs of specialist

□ one □ multiple □ non

Area

□ north Amman □ south Amman □ east Amman □ west Amman

☐ Part I

What is the application of these computer systems or electronic in the hospital? Application of total in all units means no use of any traditional systems such as paper records and electronic systems replaced or computer

Check the answer when it deems appropriate (select one answer only)

There is no potential and no desire for the application	There are plans for an application with the lack of necessary resources	plans and capabilities necessary to start the application during the year	work in Application of total in all units	at least one	Application of total in all units

:Part II

What is the application of these computer systems or electronic in these applications? Application of total in all units means no use of any traditional systems such as paper records and electronic systems replaced or computer

Check the answer when it deems appropriate Choose only one answer for each application

A : the application of electronic systems in the medical records of the following:

	There are plans for an application with the lack of necessary resources	plans and capabilities necessary to start the application d uring the year	work in Application of total in all units	at least one	Application of total in all units	There is no potential and no desire for the application
Patient General Information						
Physician Notes						
Nursing Assessments						
Complaints Lists						
Medication Lists قوائم الأدوية						
Discharge Summaries						

B - the application of electronic systems in the presentation of the following results:

	There are plans for an application with the lack of necessary resources	plans and capabilities necessary to start the application during the year	work in Application of total in all units	at least one	Application of total in all units	There is no potential and no desire for the application
Lab Reports						
Radiology Reports						
Radiology Images						
Other Diagnostic Test Results						
Consultant Reports						

C - the application of electronic systems in the bands encoding:

	There are plans for an application with the lack of necessary resources	plans and capabilities necessary to start the application during the year	work in Application of total in all units	at least one	Application of total in all units	There is no potential and no desire for the application
Laboratory specimens						
Tracking pharmaceuticals						
Pharmaceutical administration						
Supply chain management						
Patient ID						

: Part III

If the hospitals in which they operate have adopted electronic medical records systems advance, what were the following factors that represent an obstacle before this transformation

If the hospitals in which they operate have not applied systems, electronic medical records after and want to apply these regulations, which of the following factors hinder the adoption of the hospital for such systems?

If the hospital in which they operate have not applied systems of electronic medical records and do not want to apply it; the following factors are considered, any reason for that?

Check the answer when it deems appropriate (Choose only one answer for each application)

1. Finical factors

	Strong obstacle	Simple obstacle	Is not obstacle
The capital needed to purchase and implement electronic medical records system is free			
The uncertainty of the return on investment from the use of electronic medical records system HER			
The concerns about the costs of maintaining continuity of electronic medical records system is free			

2. Technological factor

	Strong obstacle	Simple obstacle	Is not obstacle
The lack of staff in the Department of Information Technology			
- Creating a system of electronic medical records meets the needs of the hospital			
The fears of lack of support in the future to the development and maintenance of the system			
Is not the ability to choose and apply system			

3. Resistance to change

	Strong obstacle	Simple obstacle	Is not obstacle
is the resistance of doctors to implement the system			
The implementation of resistance from others (staff or hospital administrators)			
The fears of a disruption in the area of clinical care during implementation			

4. Privacy and security problems

	Strong obstacle	Simple obstacle	Is not obstacle
concerns about the roads not suitable for patient information			
concerns about the legality of access to information from the system			
The concerns about the illegal manipulation of records (piracy)			

Any notes ,,,,,,,,,,,,

Thank you

Maha A.Al-Abdullah

Appendix B : Arabic Survey

الاستبيان

عنوان البحث: استخدام أنظمة السجلات الطبية الالكترونية في المستشفيات الخاصة في عمان

السيد المدير المحترم:

غزا التقدم التكنولوجي شتى مجالات الحياة و منها المجال الطبي، فكان من أهم ثماره التطور الحادث في تكنولوجيا الاتصالات و المعلومات وفي المجال الطبي؛ تعتبر دقة المعلومات وسرعة الحصول عليها أمراً في غاية الأهمية، لذلك ظهر في نهاية مطلع الألفية الجديدة نظام إلكتروني خاص بالسجلات الطبية هو Electronic Health Record و يرمز له اختصاراً بـ (EHR). و على الرغم من أهمية هذا النظام إلا أنه ما زال غير مطبق بشكل كامل سواءً في الأردن أو في معظم دول العالم.

تطرح الباحثة في هذه الاستبيان أسئلة تريد من خلالها قياس درجة استخدام الكمبيوتر أو تكنولوجيا المعلومات في المستشفيات الأردنية، و كذلك تحديد المعوقات التي تحول دون استخدام هذه التكنولوجيا في تلك المستشفيات.

لذا أرجو التكرم بالإجابة على كل فقرة من فقرات هذه الاستبانة، بكل دقة وموضوعية، علماً بأن المعلومات التي ستدلون بها، ستعامل بسرية تامة، ولن تستخدم إلا لأغراض البحث العلمي فقط .. و لكم جزيل الشكر ..

الباحثة: الصيدلانية مها حسن العبدالله

جامعة الشرق الأوسط

الجزء الأول :

هل تستخدم المستشفى أنظمة حاسوبية أو إلكترونية ☐ نعم ☐ لا

ما مدى تطبيق هذه الأنظمة الحاسوبية أو الالكترونية في هذه التطبيقات؟ (تطبيق كلي في جميع الوحدات يعني عدم استخدام أي أنظمة تقليدية مثل السجلات الورقية و استبدالها بأنظمة إلكترونية أو حاسوبية)

أ- مدى تطبيق الأنظمة الالكترونية في السجلات الطبية التالية:						
	تطبيق كلي في جميع الوحدات	تطبيق كلي في وحدة واحدة على	العمل على التطبيق الكلي في وحدة	وجود الخطط والإمكانيات اللازمة للبدء في	وجود خطط للتطبيق مع عدم وجود	لا يوجد إمكانات و لا يوجد رغبة

		الأقل	على الأقل	التطبيق خلال السنة	الإمكانات اللازمة	للتطبيق
معلومات عامة المريض						
ملاحظات الأطباء						
تقييم الممرضين						
قوائم المشاكل						
قوائم الأدوية						
تفريغ الملخصات						
التوجيهات المتقدمة						

ب- مدى تطبيق الأنظمة الالكترونية في عرض النتائج التالية:						
	تطبيق كلي في جميع الوحدات	تطبيق كلي في وحدة واحدة على الأقل	العمل على التطبيق الكلي في وحدة على الأقل	وجود الخطط والإمكانيات اللازمة للبدء في التطبيق خلال السنة	وجود خطط للتطبيق مع عدم وجود الإمكانات اللازمة	لا يوجد إمكانات و لا يوجد رغبة للتطبيق
تقارير المختبر						
تقارير الأشعة						
صور الأشعة						
نتائج اختبارات تشخيصية أخرى						
تقارير الاستشاري						

ج - مدى تطبيق الأنظمة الالكترونية في أشرطة الترميز:						
	تطبيق كلي في جميع الوحدات	تطبيق كلي في وحدة واحدة على الأقل	العمل على التطبيق الكلي في وحدة على الأقل	وجود الخطط والإمكانيات اللازمة للبدء في التطبيق خلال السنة	وجود خطط للتطبيق مع عدم وجود الإمكانات اللازمة	لا يوجد إمكانات و لا يوجد رغبة للتطبيق

عينات المختبر						
متابعة الأدوية						
إدارة الصيدليات						
إدارة سلسلة التوريد						
رقم بطاقة المريض						

الجزء الثاني :

إذا كانت المستشفى التي تعمل بها قد تبنت أنظمة السجلات الطبية الإلكترونية مسبقاً؛ فأي العوامل التالية كانت تمثل عائقاً قبل هذا التحول؟

إذا كانت المستشفى التي تعمل بها لم تطبق أنظمة السجلات الطبية الإلكترونية بعد و ترغب في تطبيق هذه الأنظمة؛ فأي العوامل التالية تعيق تبني المستشفى لمثل هذه الأنظمة؟

إذا كانت المستشفى التي تعمل بها لا تطبق أنظمة السجلات الطبية الإلكترونية و لا ترغب بتطبيقها؛ فأي العوامل التالية تعتبر سبباً لذلك؟

أ- العامل الأول: العائق الاقتصادي (المالي)

	عائق قوي	عائق بسيط	لا يعتبر عائقاً
1- يعتبر رأس المال اللازم لشراء و تطبيق نظام السجلات الطبية الالكترونية EHR			
2- عدم التأكد من العائد على الاستثمار من استخدام نظام السجلات الطبية الالكترونية EHR			
3- مخاوف بشأن تكاليف الاستمرارية للحفاظ على نظام الجلات الطبية الالكترونية HER			

ب- العامل الثاني:العائق التكنولوجي:

	عائق قوي	عائق بسيط	لا يعتبر عائقاً
1- نقص الموظفين في قسم تكنولوجيا المعلومات			
2- إيجاد نظام سجلات طبية الكترونية EHR يلبي			

احتياجات المستشفى			
3- مخاوف من عدم وجود الدعم القني في المستقبل لتطوير وصيانة النظام			
4- عدم القدرة على اختيار و تطبيق نظام			

ج- العامل الثالث: مقاومة التغيير:

	عائق قوي	عائق بسيط	لا يعتبر عائقاً
1- مقاومة الأطباء لتنفيذ النظام			
2- مقاومة التنفيذ من جهات أخرى			
3- مخاوف من حدوث اضطراب في مجال الرعاية السريرية أثناء التنفيذ			

د- العامل الرابع: مشاكل الخصوصية و الأمان:

	عائق قوي	عائق بسيط	لا يعتبر عائقاً
1- مخاوف بشأن الطرق غير المناسبة للحصول على معلومات المريض			
2- مخاوف بشأن مشروعية الحصول على المعلومات من النظام			
3- مخاوف بشأن التلاعب غير المشروع بالسجلات (القرصنة)			

Appendix – C– The academic arbitrators

No	Name	Specialization	Working Place
1	Dr.Ashraf Bany Mohammad	Computer information system	Middle East University
2	Dr.Hamzah Khraim	Marketing	Middle East University
3	Dr.Feras Al-Shalabi	Management Information systems	Al-Balqa Applied University
4	Dr.Mohammad Mayth'a	Computer information systems	Al-Balqa Applied University
5	Dr.Mohammad Matar	Accounting and investment	Middle East University
6	Dr.Abednasser Nor	Accounting	Middle East University
7	Dr.Abdallah Daas	Accounting	Middle East University
8	Dr.Shouqere Mousa	Financial and banking	AlErsa University

Appendix D Answers of Study Questions

❖ *Frequency and percentage for each descriptive question*

Q1: Gender

Table (3) sample distribution according to gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	44	73.3	73.3	73.3
	Female	16	26.7	26.7	100.0
	Total	60	100.0	100.0	

This table shows that 44 males answered the question and the percentage was 79.3 %, whereas 16 of them were females, which indicates that most of the general directors and the head managers of IT departments were males

Q2: specializations

Table (4) sample distribution according to specializations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	medical	10	16.7	16.7	16.7
	Other	50	83.3	83.3	100.0
	Total	60	100.0	100.0	

This table shows that 50 of those who answered this question were from other specializations with the percent of 83.3 %. 10 of them have medical specializations ,which indicates that most of the specialists are not from the medical sector and they might have other specializations such as IT mangers ,chief executive officers ,etc…

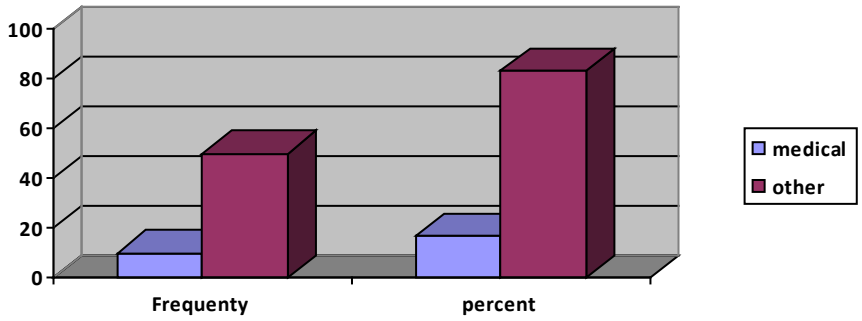

Figure (4) *Frequency and percentage for specializations*

Q3: Job

Table (5) sample distribution according to Job qualifications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	General Director	10	16.7	16.7	16.7
	Head of It Department	34	56.7	56.7	73.3
	Other Jobs	16	26.7	26.7	100.0
	Total	60	100.0	100.0	

This table shows that 34 of those who answered this question were head of IT departments and the percentage was 56.7% and it is the highest percent, which indicates that private hospitals take into consideration the importance of employing qualified IT staff.

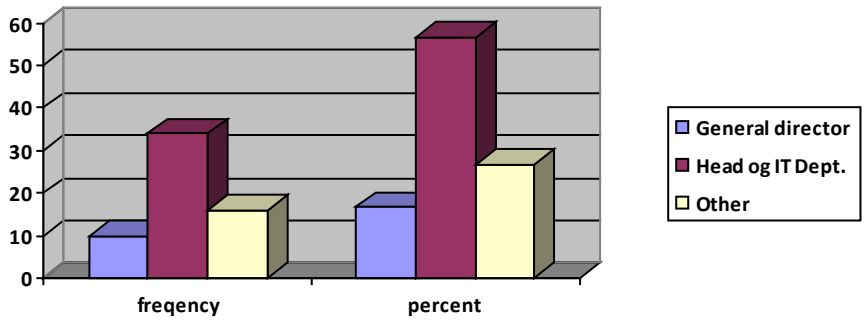

Figure (5) *Frequency and percentage for job qualifications*

Q 4: Age

Table (6) sample distribution according to age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 35	22	36.7	36.7	36.7
	35-45	28	46.7	46.7	83.3
	45-55	10	16.7	16.7	100.0
	Total	60	100.0	100.0	

This table shows that 28 of those who answered this question are from the age of 35 to the age of 45 where the percentage was 46.7% which is the highest. This indicates that private hospitals prefer hiring employees with experience.

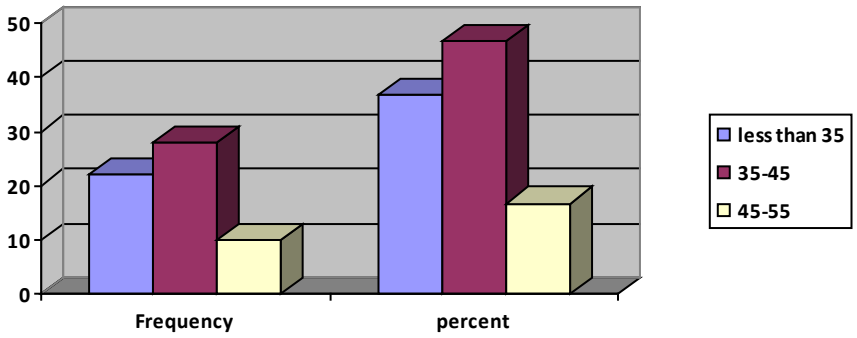

Figure (6) *Frequency and percentage for age*

Q5: The Numbers of beds

Table (7) sample distribution according to the number of Beds

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 100	42	70.0	70.0	70.0
	100 to less than 200	10	16.7	16.7	86.7
	200 to less than 300	4	6.7	6.7	93.3
	More than 300	4	6.7	6.7	100.0
	Total	60	100.0	100.0	

This table shows that 25 employees of those who answered this question said that the number of beds in the hospitals they work at are less than 100 bed. The percent average was 70% which was the highest, This indicates that most of the private hospitals in Jordan are small.

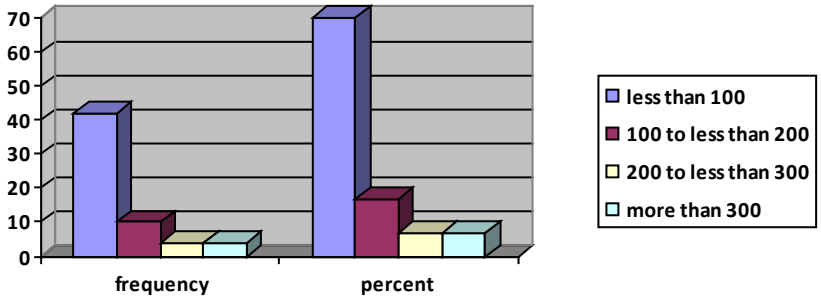

Figure (7) *Frequency and percentage for the number of beds*

Q6: The Numbers of doctors

Table (8) sample distribution according to the number doctors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10	14	23.3	23.3	23.3
	10 to less than 20	30	50.0	50.0	73.3
	more than 30	16	26.7	26.7	100.0
	Total	60	100.0	100.0	

This table shows that 30 of those who answered the question said that 50% of the private hospitals in Jordan have from 10 to 20 doctors with the percent average of 73.3% but this percent is considered to be normal for small hospitals

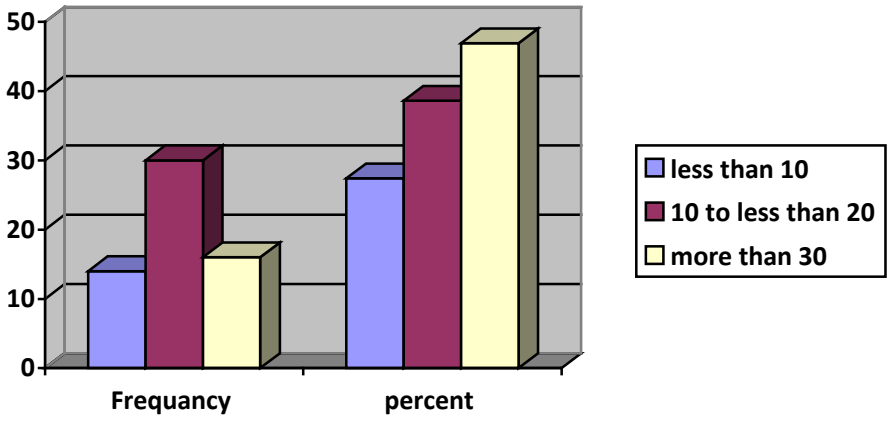

Figure (8) *Frequency and percentage for the numbers of doctors*

Q7: The Number of hospital specialists

Table (9) sample distribution according to the number of hospital specialists

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One	2	3.3	3.3	3.3
	Multiple	58	96.7	96.7	100.0
	Total	60	100.0	100.0	

This table shows that 58 of those who answered the question said that they work at multi-speciality hospitals, and the percent average was 96.7% which was the highest. This indicates that most private hospitals in Jordan are hospitals with multi-specialities

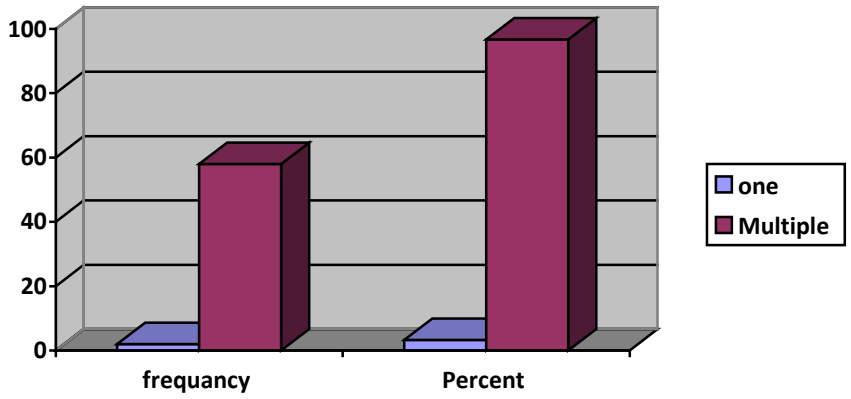

Figure (9) *Frequency and percentage for numbers of hospital specialists*

Q 8: The Location

Table (10) sample distribution according to the location

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	East Amman	12	20.0	20.0	20.0
	South Amman	12	20.0	20.0	40.0
	West Amman	36	60.0	60.0	100.0
	Total	60	100.0	100.0	

This table shows that 36 of those who answered the question said that most of the private hospitals in Jordan are located in the west of Amman. The percent average was 60% which is considered to be a high percentage.

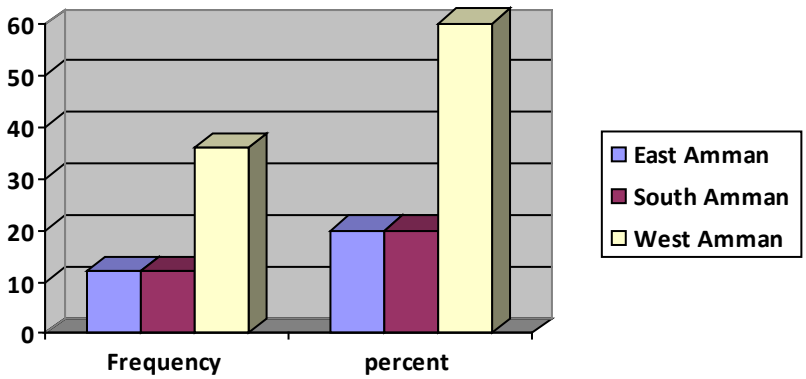

Figure (10) *Frequency and percentage for the hospitals location*