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# Diffusion of Technology in Small to Medium Medical Providers in Saudi Arabia

Ziad Hisham Arnaout  
*Walden University*

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# Walden University

College of Management and Technology

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Ziad Arnaout

has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

## Review Committee

Dr. Teresa Jepma, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Patricia Fusch, Committee Member, Doctor of Business Administration Faculty

Dr. Gayle Grant, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer  
Eric Riedel, Ph.D.

Walden University  
2015

Abstract

Diffusion of Technology in Small to Medium Medical Providers in Saudi Arabia

by

Ziad Hisham Arnaout

MPH, American University of Beirut, 1994

BS, American University of Beirut, 1992

Doctoral Study Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Business Administration

Walden University

November 2015

## Abstract

The Saudi ministry of health reported that government health care spending doubled from 2008 to 2011. To address increased demand, the government encouraged small to medium enterprise (SME) growth. However, SME leaders could not leverage technology as a growth enabler because they lacked strategies to address operating inefficiencies associated with technology. Only 50% of hospitals fully implemented information technology. The purpose of this phenomenological study was to explore lived experiences of SME leaders on strategies needed to accelerate technology implementation. This exploration drew on a conceptual framework developed from Wainwright and Waring's framework addressing issues of technology adoption. Data were collected from semistructured interviews of 20 SME leaders in Saudi Arabia. A modified van Kaam method was used to analyze participants' interview transcripts in search of common themes. The main themes were strategies to address human resources, clinical teams, funding, and organizational and leadership alignment to accelerate the diffusion of technology. Findings indicated that insurance companies influence SME operations, growth, and survival. Analysis of findings revealed the need for change in management, training, implementation follow up, and staff retention to accelerate technology implementation. Application of findings has the potential to promote positive social change in guiding SME leaders to be change agents and enabling them to create a reliable, sustainable health care delivery system.

Diffusion of Technology in Small to Medium Service Providers in Saudi Arabia

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Ziad Hisham Arnaout

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## Dedication

I dedicate this study to my father's soul who inspired me and ignited in me the flame to excel in my life, and to my family who has been there for me through it all. My father taught the meaning of dedication, love, sacrifice, giving, as well as thinking big, thinking long term, and being tenacious about my goals. Without my father's dedication and commitment, I would not be here today. He taught me how to remain solid during the hardest times. One day, I hope my children look at me as I look at my father.

I would like to thank my wife Hasna'a for being the solid rock in my life and for being my friend and biggest supporter throughout this journey. I love you and I could not have done it without you. I also dedicate this work to my four sons, Omar, Bilal, Hisham, and Fareed; you are my breath and soul. I hope that I have been a role model for you. Be inspired to excel in your lives, always aim high, and above all remain humble. I promise to pay you back the time I missed spending with you because of the days, weekends, and nights I spent on my study.

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## Section 1: Foundation of the Study

### Background of the Problem

The demand and spending on health care services in Saudi Arabia have increased (Ministry of Health [MOH], 2012a). Government spending doubled from 30 billion Saudi Riyals in 2008 to 68.7 billion in 2011, representing 75% of the total spending on health care (MOH, 2012a). As a result of the unstable economy and oil prices, Saudi government officials applied strategies to spread the health care provision load with higher participation from the private sector (Ahmad, 2012). Saudi government officials launched strategies to promote small to medium enterprises (Al Merdah & Sadi, 2011) and compulsory medical insurance law (Saudi Arabian Monetary Agency [SAMA], 2014). Technology is an enabler for SMEs; however, the Saudi SMEs are not yet equipped with the right technologies (Altuwaijri, 2011). Saudi SMEs suffer from lack of trained personnel who have skills to manage and use information systems efficiently (Al Merdah & Sadi, 2011; Alzahrani, 2011).

Some researchers addressed the diffusion of technology and innovation in health care (Cohn et al., 2009; Hood, 2011). Al Merdah and Sadi (2011) addressed the topic of SMEs in Saudi Arabia. However, few researchers addressed the topic for the medical SMEs. Health care companies would benefit from a study on the elements that affect the diffusion of technology among SMEs in Saudi Arabia. The results of this study could assist government and private sector personnel efforts to meet the health care industry's emerging demands. The study findings may inform SME leaders and enhance their knowledge about strategies needed to accelerate the diffusion of technology.

### Problem Statement

The Saudi government health care spending doubled from 2008 to 2011 (MOH, 2012a). Government officials encouraged SME growth to reduce spending, diversify national income, and reduce dependence on oil (Al Merdah & Sadi, 2011). Implementing technology is critical for SME growth (Badrinarayanan & West, 2010); however, only 50% of hospital staff fully implemented technologies like electronic health records (Aldosari, 2014). Elements such as (a) management, (b) training, (c) financing, (d) human resources, and (e) policies affect the diffusion of technology in SMEs (Al-Hudhaif & Alkubeyyer, 2011; Al Merdah & Sadi, 2011; Altuwaijri, 2011; Badrinarayanan & West, 2010; Sadi & Henderson, 2011). The general business problem is the inability of Saudi SME medical providers to leverage technology to absorb more business and operate efficiently (Ahmad & Agrawal, 2012; Almalki, Fitzgerald, & Clark, 2011). The specific business problem is that some SME medical provider leaders lack strategies to address operating inefficiencies associated with technology implementation.

### Purpose Statement

The purpose of this qualitative phenomenological study was to explore the strategies SME medical provider leaders need to address operating inefficiencies associated with technology implementation. Knowledge is the first step in the innovation adoption process (Rogers, 2003). Exploring the strategies associated with the technology implementation process may inform SME leaders on pathways for accelerating the diffusion of technology. The population for this study was SME leaders such as owners, administrators, medical directors, IT directors, and finance directors. A purposive sample

of at least six to 12 participants was suitable for this study (Ando, Cousins, & Young, 2014); however, the minimum number of participants for this study was 20 to satisfy Walden University's requirement. The study included SMEs from Riyadh City in Saudi Arabia. Face-to-face, semistructured interviews provided the means for collecting data addressing the research question.

A company can achieve a successful, value-driven approach to enable the effective use of technology and management of organizational change and technology implementation by combining the right people, processes, and technology. The results of this study might guide SME leaders to implement strategies that address the elements that affect the diffusion of technology. Findings from this study might assist SME leaders to be effective in introducing and successfully leading technology projects. Recommendations from the study might contribute to social change through improving the health care field through enhancing quality, access, and affordability of care.

#### Nature of the Study

A qualitative research method was used for this doctoral research project. Qualitative methods are suitable for understanding and describing social action and meaning (Moustakas, 1994). Qualitative research methods allow for the exploration of human behavior in individuals and groups (Patton, 1990). The qualitative research method involves many layers of interpretation of human experiences and actions without numerical data (Rennie, 2012). Qualitative methods are useful to explore the complex reality formulated by individuals' experiences (Erlingsson & Brysiewicz, 2013). Patton argued that qualitative inquiry typically focuses in depth on relatively small samples.

Findings from qualitative research could provide new perspectives on the diffusion of technology in medical SMEs (Wainwright & Waring, 2007). Through such studies, researchers can explore patterns of health care professionals' views (Weiner, Amick, Lund, Lee, & Hoff, 2011). The way to express qualitative research studies depends on the design approach (Erlingsson & Brysiewicz, 2013). Researchers applied quantitative approaches in early studies of diffusion of innovation (Rogers, 2003). Rogers (2003) contended that qualitative and quantitative methods are suitable for studying diffusion of innovation (DOI). The quantitative approach included objective data analysis; however, quantitative researchers could not explore participants' personal experiences and capture their meaning and essence. The qualitative approach was suitable for this study because I explored the subjective perspectives of SME executives regarding potential elements not yet discovered for quantitative measurement and testing. Sampling was purposive rather than random. Because I sought only qualitative data, I did not choose a mixed-methods approach.

Phenomenology involves experiences and events, not theoretical circumstances (Moustakas, 1994). The phenomenological approach allows researchers to understand the situation under study through the lived experiences of study participants (Moustakas, 1994). In diffusion of technology (DOT) studies, the phenomenological approach can allow for rich data analysis and the development of conceptual themes through clustering into broader groupings (Erlingsson & Brysiewicz, 2013; Gutiw, 2011; Wainwright & Waring, 2007). The qualitative phenomenological research design supports the exploration of elements that affect the diffusion of technology at SMEs in Saudi Arabia.

The ethnographic method involves studying groups with relation to cultural behavior. An ethnographic approach was not suitable for this study because prospective participants did not belong to the same culture (Hanson, Balmer, & Giardino, 2011). The intention was not to examine the culture of groups within communities. The grounded theory design is used for developing a new theory. The grounded theory design was not suitable for this study because the purpose of this study was not to build a theory but to explore the experiences of participants (Zarif, 2012). Data collection included face-to-face semistructured interviews. Selecting a homogeneous group of participants from different SMEs reduced possible bias in purposive sampling. Homogeneous sampling focuses on simplifying and reducing the variation.

#### Research Question

The research question for this study was the following: What strategies do SME medical provider leaders need to address operating inefficiencies associated with technology implementation? To answer this question, I conducted face-to-face semistructured interviews with SME leaders who influence the decision-making process, such as administrators, medical directors, IT directors, and finance directors. The interview questions listed in Arnaout Inquiry of the Elements Contributing to Technology Diffusion (see Appendix A) were developed from a review of the current body of literature

#### Interview Questions

The interview questions were as follows:

1. What is your experience with strategies needed to address the human resource



element as it pertains to accelerating the diffusion of technology as a growth enabler in your company?

2. What is your experience with strategies needed to address clinical teams' role as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
3. What is your experience with strategies needed to address technology funding as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
4. What is your experience with strategies needed to address organizational leadership and alignment as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
5. What additional information would you like to add?

#### Conceptual Framework

No single model or framework is detailed enough to use in studying the diffusion of technology acceptance in the health care industry (Wainwright & Waring, 2007). Wainwright and Waring (2007) sought to develop a hybrid model that explains the complex issues of technology adoption, acceptance, diffusion, and infusion. The conceptual framework for this study originated from a hybrid framework proposed by Wainwright and Waring (2007). Mustonen-Ollila and Lyytinen (2003) identified 28 elements that affect the diffusion of innovation. The main elements addressed in this study were human resources, organizational leadership and alignment, clinical team role

and power, and finance availability. The hybrid model informed the analysis process of the elements under study.

The main purpose of having a hybrid-adapted model was to understand human, social, and political issues associated with the diffusion of technology in the health care field. Wainwright and Waring (2007) confirmed that health care SMEs need a simple and adaptable framework that would provide analytical depth to explore power, political, and organizational issues within the context of bureaucratic authority and political agenda. According to Wainwright and Waring, the adapted DOI framework allows for the exploration of professional cultures and political contexts within the health care SMEs.

#### Definition of Terms

In this doctoral study, I will use *SME* to refer to SMEs functioning as service providers. I will also use the term *technology* to refer to health information technology (HIT), eHealth, and other forms of information and communication technology (ICT). Other key terms and definitions are as follows:

*eHealth*: eHealth is the use of information and communication technologies for health (World Health Organization [WHO], 2013).

*Health information technology (HIT)*: HIT encompasses a wide range of products and services including software, hardware, and infrastructure designed to collect, store, and exchange patient data throughout the clinical practice of medicine (American Medical Association, 2013).

*Health practitioner:* A health practitioner holds scientific qualifications and experiences that qualify him or her to work safely in a profession in the health sector in the Kingdom of Saudi Arabia (Saudi Commission for Health Specialties, 2014).

*Service provider:* A service provider is the health facility (government/nongovernment) adopted by the Council of Cooperative Health Insurance in accordance with applicable laws to provide health services in the Kingdom; examples include a hospital, diagnostic center, clinic, pharmacy, laboratory, physical therapy center, and radiation therapy (Council of Cooperative Health Insurance, 2013).

*Small to medium enterprises (SMEs):* Small enterprises are classified as having fewer than 60 employees and medium-size businesses as having fewer than 100 employees (Saudi Arabian General Investment Authority, 2013).

### Assumptions, Limitations, and Delimitations

In this section, I address general assumptions about the topics covered in this study. The section also includes limitations that are specific to Saudi Arabia. I also describe the delimitations of this study, including location, sample size, and scope of HIT applications.

#### Assumptions

The first assumption was that the application of qualitative research methods may give a broad understanding of clinical, administrative, and operational realities. Qualitative methods would help me understand the views of SME executives and other decision-making individuals. Moustakas (1994) confirmed that phenomenology involves experiences and events, not theoretical circumstances. Moustakas argued that

participants are experienced in the phenomena, interested in understanding it, and willing to share their experience. Selecting experienced staff mitigated the risk of having uninterested participants with weak knowledge about the phenomena under study (Moustakas, 1994).

I assumed that HIT has a positive impact on the service provider SMEs. I also assumed that the decision-making process related to HIT adoption at service provider SMEs rests on executive management, clinical leaders, and IT leaders. Examining lower-level staff and patients added value because their contribution could be another factor that affects the diffusion of HIT. I also assumed that HIT implementation in the government and private providers would be similar to SMEs. Similar impacts on quality, access, and cost were also applicable to SMEs. Finally, I assumed that SMEs in different Saudi cities would react similarly, and therefore the results of this study would be relevant to the different regions in Saudi Arabia.

#### Limitations

Despite possible limitations, study findings might inform SME leaders about elements affecting the diffusion of technology. One of these limitations was that the SMEs are located in Riyadh city, the capital of Saudi Arabia. Extending the study to include SMEs in all main cities would add value in future research. Exposing different adoption patterns of main cities is important (Ahmad, 2012; Bah et al., 2011).

Conducting interviews with SME leaders across the country would provide an in-depth understanding of the elements restricting the diffusion of technology because SME workforce and ownership structures are homogeneous. Studying HIT in its generic form

was another limitation because I did not address the implementation of particular HIT applications. Future researchers could explore the diffusion of specific HIT applications. Some of the participants gave their feedback in Arabic, and translating their responses into English was a challenge. Translating from English to Arabic and vice versa was also a limitation in conducting interviews. However, my status as a native Arabic speaker who possesses English language skills mitigated this risk. In this study, I did not address the cultural work values. Another limitation emerged because of the skewed distribution of the nonSaudi workforce, especially in SMEs (Almalki et al., 2011). Saudi participants are low in comparison to other nationalities (Almalki et al., 2011). Finally, the time needed for the interviews, participants' availability, and participants' willingness to provide accurate and honest answers presented a challenge.

#### Delimitations

The main delimitations of this study included location, sample size, scope of HIT applications, and elements affecting the diffusion of technology. First, I conducted a phenomenological study with service provider SMEs in Riyadh. I selected participants based on a purposive sampling technique. The purposeful selection of participants included SME leaders such as administrators, medical directors, IT directors, finance directors, and medical directors. Human resources, organizational leadership and alignment, clinical team role and power, and financing were the main elements addressed in this study. However, other elements such as management skills and economic conditions could contribute to the slow diffusion of technology (Al Merdah & Sadi, 2011;

Aleke, Ojiako, & Wainwright, 2011; Badrinarayanan & West, 2010; Sadi & Henderson, 2011).

### Significance of the Study

This study is of value because it may contribute to effective business practices by improving technology adoption and the capacity to accommodate larger volumes of business while reducing operating expenses. The results of this study may contribute to positive social change through improving the health care field through enhancing quality, access, patient satisfaction, and affordability of care. The first part of this section includes the role of SMEs in changing health care industry. The second part of this section includes a reflection on how the results of this study may contribute to social change.

### Contribution to Business Practice

Health care delivery systems should continue to change to meet the changing needs of societies (Almahdi & Dickson, 2010; Bahaddad, Houghton, & Drew, 2013). Technology will support SME leaders' efforts to respond to the challenges of rising costs, new insurance laws, increase in knowledge, and the need for high quality and personalized care (Altuwaijri, 2011). The WHO (2012) recommended looking for opportunities to increase efficiency instead of cutting spending. Health information technology will facilitate accessing and sharing of information and will provide the right platform to accommodate larger volumes of patients without influencing the quality of service (Buntin, Burke, Hoaglin, & Blumenthal 2011; Cohn et al., 2009). Bardhan and

Thouin (2013) contended that health information technology is linked to productivity and has the potential to impact quality of services and to lower operational expenses.

The results of this study added to the Saudi health care body of knowledge, especially in HIT. This study may contribute to an understanding of HIT implementation and may help SME leaders to develop and improve the capacity to accommodate larger volumes of business. The new HIT implementation will also encourage SME leaders to provide timely and high-quality services and enhance competition among SMEs (Ahmed, Shahzad, Umar, & Khilji 2010; Almahdi & Dickson, 2010). Decision makers may use the results to identify the best technologies and practices applied elsewhere. SME leaders may use the results to improve their technology adoption and streamline their efforts. Health care treatment advancement enhances quality and accessibility to care (WHO, 2013). As a result, the results may improve the social conditions of people living and working in Saudi Arabia.

#### Implications for Social Change

The health care industry is a main pillar of any society, and any improvement to the health care delivery system would have a positive social impact (Fayn & Vuillerme, 2013). Health care delivery systems should continue to change to meet the changing needs of societies. In this study, I explored the reasons leading to the slow diffusion of HIT at service provider SMEs. Findings from my study contributed to creating a reliable, sustainable health care delivery system in Saudi Arabia. Overall, the adoption of HIT may contribute to strengthening the role of SME service providers in economic growth.

Health information technology is likely to strengthen patients' satisfaction (Roham, Gabrielyan, & Archer, 2012) with and engagement in the health care process, and to improve the health of individuals (Al-Shorbaji, 2013; Lewis, Synowiec, Lagomarsino, & Schweitzer, 2012). Improved access to information will empower and enable health care professionals and patients to make informed decisions (Cohn et al., 2009), which can lead to quality, access, and cost improvements (Al-Shorbaji, 2013). Buntin et al. (2011) reported that the service providers that applied advanced HIT had lower mortality, cost, and complications. Health information technology is the main enabler for service providers that allows them to address the rising cost challenges (Al-Shorbaji, 2013; Buntin et al., 2011; Tamrat & Kachnowski, 2012). HIT also contributes to cost decreases through increasing organizational and clinical performance, which may increase information diffusion (Lewis et al., 2012).

Any effort that leads to improvement in the social condition of individuals, communities, and society is a positive change enabler. I sought to promote positive social change by increasing the knowledge of service provider SMEs, payers, and regulators regarding the main elements that contribute to slow diffusion of HIT. The results of this study may allow service provider SMEs to increase HIT adoption. Health information technology may improve access to services, reduce the overall pressure on patients, and preserve people's health (Al-Shorbaji, 2013). The use of new constructs that emerge from this study could speed up HIT adoption. Health information technology could transform health care delivery in a way that induces positive social change. Findings and recommendations from this study may add to positive social change if



service provider SMEs use the findings to set up training programs for health care professionals and to communicate the benefits and impact of HIT to working teams. Service provider SMEs could use the findings to encourage early adoption of new technologies that can meet professionals' needs as well as improve patient care.

#### A Review of the Professional and Academic Literature

The literature review included evidence from many international, regional, national, and local sources. The comprehensive assessment and synthesis of global research on SMEs, ICT, HIT, eHealth and health care delivery systems, and diffusion of technology and innovation theories relied on sources obtained from (a) ABI/Inform Complete, (b) Academic Search Complete, (c) Business Source Complete, (d) Emerald Management Journals, (e) ScienceDirect, (f) Medline, (g) EMBASE, (h) Pubmed, (i) Cochrane library databases, (j) Google Scholar, (k) ProQuest Dissertation and Theses, and (l) government and official websites. I initially identified over 332 articles through systematic reviews using the following keywords: *diffusion of innovation, DOI, diffusion of technology, technology acceptance model, TAM, ICT, IT, information technology implementation, health care information technology, eHealth, mHealth, SMEs in Saudi Arabia, health care in Saudi Arabia, eHealth, eHealth benefits, electronic health records, and electronic medical records*. I found 143 relevant sources including three books, three dissertations, and eight government publications. The total number of references used was 143, of which 85% were peer reviewed and 87% were published between 2011 and 2015. Based on the literature review, I developed an understanding of the importance of

SMEs in Saudi Arabia and to the global economy. I also developed an understanding of the health care delivery system and the role of ICT in transforming businesses.

#### Health Care and Health Information Technology in Saudi Arabia

This section contains a review of the existing literature relevant to the research topic. I provided an overview of Saudi Arabia's health care industry and ICT status. The section also contains a description of the elements that contribute to the health care industry.

Health care in Saudi Arabia. The Saudi economy is the largest economy in the Middle East and North Africa region (Saudi Arabian General Investment Authority [SAGIA], 2013). The total government income of non-oil contributions increased from 16% to 22% (Ministry of Foreign Affairs [MOFA], 2013). The total population in 2011 reached around 29 million (World Bank, 2013), and the population annual growth rate reached 2.7% resulting in an increase in the demand for services in all industries including health care, telecom, education, and utilities (Central Department of Statistics and Information [CDSI], 2013). The private sector contribution to the GDP in 2012 reached 58.8% (CDSI, 2013). In the last 20 years, Saudi health care companies evolved to meet the need of the growing population in 19 health regions. The increase in oil production and prices, determination to improve the health care services, development of a qualified Saudi workforce, and increase in population knowledge were elements that contributed to improved health care services.

Saudi government officials introduced 5-year development plans to develop all sectors, including health care. The health care system leaders stressed setting up the

necessary health care infrastructure of hospitals, clinics, pharmacies, laboratories, and research facilities (Almalki et al., 2011). In line with the development efforts and plan to strengthen the integration and coordination among different health care sectors, in 2002 a royal decree led to the creation of the Council of Health Services (Almalki et al., 2011). The main role of the council was to improve coordination and integration among all health care sectors in the country. This led to a decrease in duplicated efforts and wasted resources in the health care sector.

Health care services evolved to address the increase in demand and pressure on pricing (Almalki et al., 2011). Saudi government officials wanted to reduce the spending in public hospitals and restrict expatriates' access (Al-Jazairi, Al-Qadheeb, & Ajlan, 2011; Alkhamis, Hassan, & Cosgrove, 2013). Alkhamis et al. (2013) contended that the health care system in Saudi Arabia was fragmented, noting the need to increase expenditure in the private health care industry. Private health care providers in Saudi Arabia need support to respond to the emerging market demands.

The Saudi Arabia health care system ranked as 26th among 190 health care systems in the world (WHO, 2012). Almalki et al. (2011) contended that health and medical service quality and quantity in Saudi Arabia improved in the last decade. The total number of hospitals in Saudi Arabia is 435 with a total bed capacity of 61,036 (Ministry of Health, 2012b). The MOH, which provides 60% of total health care services, has 259 hospitals with a capacity of 35,828 beds and employs 26,266 doctors, 64,408 nurses, 1,661 pharmacists, and 32,025 allied health personnel (MOH, 2012b). The number of government hospitals is 39, and they serve certain group members (MOH,

2012b). Government support for the private sector is in the form of long-term, interest-free loans for setting up hospitals, clinics, and pharmacies. The private sector has 137 hospitals; 14,165 beds; and 1944 clinics (MOH, 2012b).

Demand on health care services increased by expanding the health care delivery system. With the increase in demand for health care services, government health care spending increased from 2.8% in 1970 to 6.9% in 2011 (MOH, 2012a). Population growth, introduction of compulsory insurance, changes in lifestyles, and growing population knowledge drove the increase in demand. Saudi Arabia provides citizens with universal health care coverage. The total spending on health care in Saudi Arabia appears low only 4.3% GDP compared with these developed countries such as United Kingdom and Sweden having a GDP of 7% and 8.2% (MOH, 2012a; World Health Organization, 2012). Private sector spending increased from 28.4% in 2000 to 37.6% in 2009 (WHO, 2012). According to Almalki et al. (2011), financing, workforce, spending, changing patterns of diseases, accessibility to health care services, cooperative health insurance plan, privatization of public hospitals, use of electronic health strategies, and developing a national system for health information are elements that present a challenge for the health care delivery system.

Almalki et al. (2011) reported that the total health workforce in Saudi Arabia is about 248, 000, and more than 50% work in the MOH. The dependence on expatriates created some instability in the health care industry. The Saudi leadership supported developing the capabilities of Saudis and encouraged them to work in the health care field, but the existing Saudi workforce did not exceed 38% (Almalki et al., 2011).

Almalki et al. reported that the Saudi population could reach 39.8 million by 2025, thus increasing pressure on health care services. As a result, more staff would be needed to support the health care system.

The expected increase in population put pressure on Saudi government to fund health care. The government experts set up a national strategy for improving health care services in 2009. The strategy was intended to diversify fund sources, develop information systems, develop the human workforce, activate the administration and monitor the MOH role over medical services, encourage the private sector to provide health services, and distribute health care services equitably to all regions. Under the supervision of The Council of Health Services, the MOH assumed the responsibility of delivering the new strategy in coordination with the other health care sectors. The strategy was intended to speed up the MOH transition to an electronic environment and EHR implementation.

Health information technology in Saudi Arabia. The increase in the use of information and communication technology (ICT) contributed to globalization and economic growth through the delivery of services and information, effective interactions with business and industry, citizen empowerment through access to information, and efficient public sector management (Alshomrani, 2012). The advancement in ICT transformed societies into integrated and information-based societies (Ahmad & Agrawal, 2012). In Saudi Arabia, the telecommunication infrastructure index improved from 2003 to 2010 (Alshomrani, 2012). Internet and Web development were the most exciting improvements in information and communication technology in Saudi Arabia

(Eid, 2011). In Saudi Arabia, the Internet penetration rate was 55.1% and the estimated spending on ICT services reached SAR102.56 billion in 2013 (Communications and Information Technology Commission [CITC], 2013). The Internet spread and availability are indicators of ICT need by the population (AlGhamdi, Nguyen, & Jones, 2013).

ICT emerged to serve as an ingredient for improving health care delivery, as well as increasing patients' engagement in their own care. The WHO (2013) reported that ICT supported sustainable financing of health care systems and promoted universal access. Implementation of health information technology (HIT) contributed to patients' satisfaction and meets the expectations of health authorities and businesses by providing high-quality services at an acceptable cost (Buntin et al., 2011). The WHO (2013) urged all countries to endorse eHealth strategies and to develop related legislative mechanisms and policies.

For many developed countries, eHealth priorities includes personal health portals, health care identifiers, patient IDs, eHealth cards, increasing investment in information technology, electronic appointment registration, electronic prescribing, and telemedicine services (Nasiripour, Rahmani, Radfar, & Najafbeigi, 2012). The United Nations also acknowledged the unprecedented potential of eHealth and estimated that, by 2012, half of the people living in remote areas will have mobile phones (Victoria & Nicogossian, 2011). According to Victoria and Nicogossian (2011), implementation of eHealth can increase the efficiency of health care delivery models, improving supply chain processes in remote areas, improving patient care, offering medical professionals the ability to get

real-time diagnoses for clinical trials, and providing health care workers with access to information so they can treat patients effectively. Technology can extend health care delivery to remote and deserted areas (West, 2012).

Van Gemert-Pijnen et al. (2011) argued that eHealth has many definitions and formats such as telemedicine, telehealth, wireless technologies, and interactive health communications. The term *eHealth* refers to a variety of modern technologies that support health and health-related fields, and meet the needs of citizens, patients, health care professionals, health care providers, and policymakers. In this doctoral study, I defined *eHealth* as the use of ICT in the health care sector to improve health and health care systems, and I used these terms interchangeably.

Scholarly literature contains many references to the impact of technology and innovation and associated changes on productivity. However, many of the current researchers in this area focused less on the adoption decision than what adoption facilitates (Ismail & Mamat, 2012). Quality of care could potentially improve because of eHealth, which impacts patient satisfaction, patient convenience, effectiveness and efficiency of care, and the overall patient care experience. Electronic health contributes to better access, communication, data management, patient care, diagnosis, and treatment (Al-Shorbaji, 2013; Lewis et al., 2012). Al-Shorbaji (2013) added that eHealth is effective in lifting the quality of services, reducing costs, and increasing access. Lewis et al. (2012) agreed that access to health care improved by extending health companies spread, improving communication between patients and providers, improving diagnoses and treatments, avoiding fraud and abuse, and streamlining financial transactions. Added

benefits included improved access to information and resources, empowerment of patients to make informed health care decisions, enhanced organizational processes and transactions, and improved quality, value, and patient satisfaction. Implementing ICT affects the time allocated to provide health care services. Househ, Borycki, and Kushniruk (2014) argued that patients are empowered by Electronic health technologies and social media. Househ et al. confirmed that eHealth is associated with increased patient involvement, improved emotional health, and increased self-monitoring.

Electronic health could offer access to comprehensive services to improve, maintain, and restore people's health. Mobile health refers to the use of mobile phones to improve the quality of care and increase efficiency of service delivery in health systems (Noordam, Kuepper, Stekelenburg, & Milen, 2011; Upadhyay et al., 2012). Noordam et al. (2011) confirmed that complex setups such as emergency obstetric care achieved faster modes of communication and improved access through the mHealth applications. Tamrat and Kachnowski (2012) also discussed how the application of mHealth improved access, reduced cost, and simplified contacting patients. In addition, mHealth extended the interaction between medical providers' staff and the patients beyond the walls of the hospital; it improved efficiency, saved time, and reduced costs (Noordam et al., 2011). Mobile phones were effective tools that need basic skills and effective in low resource settings (Victoria & Nicogossian, 2011). Mobile health improved medical outcomes and patients' behavior and showed promise for improving adherence rates when used between medical visits (Rotheram-Borus, Tomlinson, Swendeman, Lee, & Jones, 2012). Chronic health disease management improved because mHealth freed physicians from



routine office visits while providing data on patient conditions (West, 2012). Jian et al. (2011) stated that patients need to carry their own records and pointed out the needs of hospitals to provide information to the patient electronically. Services reached underserved areas through mHealth technologies (West, 2012).

Electronic health technologies offer opportunities to increase productivity and contain cost. Electronic health would allow efficient use of skilled health workers time and reduce duplication of efforts. Schweitzer and Synowiec (2012) argued that eHealth would save the patient time and the need for multiple clinic visits. Internal operation would be streamlined in a way that would allow target distribution of the information use for many purposes. Medical providers view e-Health as an opportunity to increase efficiency, reduce administrative costs, facilitate communication, and improve patient care (Lewis et al., 2012). Some companies consider the Internet as a way to streamline health care administrative costs and improve communication among the various health care companies.

One pillar of the overall national strategy for improving health care services in 2009 was the eHealth strategy that aimed at improving quality and performance and reducing the cost of delivery, connectivity, waiting times, and communication. The MOH granted a budget of SR 4 billion (USD 1.1 billion) to set up a 4-year development program (2008-2011) to develop eHealth initiatives in the public health domain (Almalki et al., 2011). The eHealth strategy goals were to care for patients, connect providers, measure performance, and offer excellent health care services (Ministry of Health, 2013). Alghamdi, Goodwin, and Rampersad (2011) contended that the proper ICT strategy

should be in place to achieve successful e-government implementation. Alghamdi et al. (2011) further reported that Saudi Arabia was one of the countries that made progress in improving its online services provided by government among the global e-government readiness surveys from 2005 to 2010.

Electronic health records implementation varies amongst medical providers. In a study conducted on 19 MOH hospitals, Bah et al. (2011) recorded a slow rate of EHR adoption of 15.8%. In contrast, implementation of EHRs was more successful in other government hospitals such as King Faisal Specialist Hospital & Research Centre (KFSH & RC). KFSH & RC operated the latest ICTs since the beginning in 1975 and was one of the early Internet technology and telemedicine users since 1993. Saudi citizens showed increased reliance on ICTs, in particular, computers and Internet services, when compared with other emerging countries; however, it is still below the possession rate in the advanced world (Al-Ghaith et al., 2010).

The challenge of protecting information and security issues affects the implementation of EHR (Murtaza, 2012). Wu, Straub, and Liang (2015) contended strategic alignment affects IT governance and organizational performance. Wu et al. concluded that many companies neglect IT governance confirming the link links three important themes of organizational and IT research: IT governance, strategic alignment, and organizational performance. Regulators will organize the usage of data and without laws; the DOT will be slow.

Alsafadi and Abunafes (2012) reported that the total IT spending in Saudi Arabia reached 27 billion Saudi Riyal in 2010 and forecasted to reach 46.3 billion Saudi Riyal in

2015, representing a compound annual growth rate (CAGR) of 11.4%. There was an increased need for qualified, experienced, IT resources triggered by an increase in demand on ICT. As a result, Saudi Arabia's online spending increased to reach around USD three billion in 2010 (Zeglat & Alzawahreh, 2012). The spending on ICT recorded an annual growth of 14% from 2005 to 2013 (CITC, 2013). More growth would occur driven by both government and private sector investments (CITC, 2013). Al-Ghaith et al. (2010) recommended that the government officials should encourage investments and issue more licenses for ICT providers to create a competitive business environment that could increase the quality and lower costs of offered services.

#### Small to Medium Enterprises

Small to medium enterprises are engines of growth and innovation. Global consensus exists on SMEs contribution to job creation, economic growth, and diversification. Small to medium enterprises are essential sources of jobs, entrepreneurial spirit, innovation, and are necessary for fostering competitiveness and employment. Developed and developing countries need the SMEs. In OECD countries, SMEs make up over 95% and up to 99% of enterprises, and are responsible for between 60-70% of the job creation (Organization for Economic Co-operation and Development [OECD], 2013). Small to medium enterprises offer local work and build a defense line against eradication by globalization. The importance of SMEs in economic growth made them a central element in much recent policy-making. SMEs growth prospects need government backing and support.

Small to medium enterprises definition. No consistent common definition of SMEs prevails. Finding a uniform definition used by most countries is difficult because it differs depending on parameters such as the number of employees, annual turnover, assets, and the amount of capitals. Ahmed et al. (2010) posited that features such as ownership, management and organizational structure, capital resources, objectives, markets, and customers define SMEs. In Malaysia, SMEs have less than 150 employees and an annual turnover less than SAR 2.5 million; in Japan, the number of staff for services SMEs is less than 100 compared to manufacturing that is less than 300 employees (OECD, 2013). In contrast, the U.S. manufacturing SMEs employ between 500 and 1,500 (OECD, 2013). Developing countries use the United Nations Industrial development Organization's (UNIDO) definition. According to the United Nations Industrial development Organization (2013), the employees' headcount of small enterprises is between 10 and 49 and of medium enterprises from 50 to 249. In Saudi Arabia, most use definitions by the Saudi Arabian General Investment Authority (SAGIA, 2013). SAGIA classified SMEs based on the number of employees: small enterprises have fewer than 60 employees, and medium-size companies have fewer than 100 (SAGIA, 2013). Small to medium enterprises in Saudi Arabia are smaller when compared to SMEs in developed countries.

Small to medium enterprises' role in the economy. Small to medium enterprises make up most the total business enterprises in countries and are one of the driving forces in the national economy. Bahaddad et al. (2013) pointed out that the number and size of companies affected corporate competitiveness. Bahaddad et al. also

noted that expanding the size and number of companies influenced the promotion of e-commerce performance as well as exposing companies to successful global markets. In most developed countries, the contribution of SMEs to the national economy represents over 80% of industrial production (OECD, 2013). Small to medium enterprises play a role in diversifying the national economy and growing industrial production. Small to medium enterprises contribute to local growth whereas creating employment opportunities for local resources.

Small to medium enterprises are also a source of innovation. Many SMEs were successful in introducing new products and innovations, especially in using and adopting new technology. Small to medium enterprises proved to be aggressive, progressive, flexible in adapting to new business needs, and in adopting change in comparison to large companies. Bahaddad et al. (2013) argued that SMEs features differ from large companies. Bahaddad et al. also argued that SMEs focus on simple methods to manage their operations that require less advanced technical expertise and a smaller number of professionals who depend on the owner or executive director for solutions. The decision-making process at SMEs resides with the owners and executives (Bahaddad et al. 2013). Small to medium enterprises follow simple management form and avoid complex governance (Bahddad et al., 2013). The dynamic and flexible nature of SMEs allowed them to withstand economic downturns (Bahddad et al., 2013).

Small to medium enterprises in Saudi Arabia. The SMEs' role in the Saudi market is to support diversification of the economy, create employment, and offer technical innovation. Almahdi and Dickson (2010) reported that the Saudi government's

interest in developing and supporting SMEs started in 1999. In the Saudi Eighth Development Plan 2005-2009, oil price and growing population triggered emphasis on the SMEs role. The government officials enabled the SMEs to achieve their goals by addressing constraints on SMEs activities. Sadi and Henderson (2011) confirmed that SMEs grew over the last 10 years when measured by total sales and market share to contribute 28% of total national economic activity. Because SMEs role is crucial to the economy, SMEs will continue to grow.

Small to medium enterprise structure and form should evolve to grow. The growth rate in the Saudi business private sector rose around 4.5 % yearly (Bahaddad et al., 2013). In concert, Ahmad (2012) found in a field survey 2009-2010 that around 90% of Saudi SMEs are at the prestart and existence/ survival stages, and 11.9% are at the growth level. In the same field survey 2009-2010, Ahmad also revealed that 53.1% of the SMEs are start-ups and 41.2 inherited. According to Almahdi and Dickson (2010), SMEs represent 95% of the whole number of enterprises in Saudi Arabia. Hertog (2010) added that the majority SMEs in 2008 were family businesses, and 71% of industrial establishments were small and medium sized. According to the Riyadh Chamber of Commerce and Industry in 2008, 96% of Saudi enterprises employ less than 100 workers (Hertog, 2010). In 2008, more than 700,000 SMEs are active in Saudi Arabia with 47% of SMEs engaged in commercial and hotel businesses, 27% in construction, 12% in industry, 6% in social services, and 8% in many other sectors (Hertog, 2010). Bahaddad et al. (2013) argued that the role of the SMEs stems from being a source of private sector investment. By playing a vital role in the Saudi economy, SMES will preserve their

existing value. However, SMEs need to address many challenges preventing performing efficiently. Small to medium enterprises would play a pivotal role because they will create business opportunities for young Saudis.

Private and public sectors offer an array of support program for SMEs. Hertog (2010) reported that the Saudi Industrial Development Fund (SIDF) established a special “Kafala” fund for SMEs with a capital of 200 million Riyals (53 million \$), which is 50% funded by the government and 50% by the Saudi local banks. Hertog explained that Kafala worked as a loan guarantee program. In 2006, the total loans made available to 36 companies amounted to SR 49 million (USD 13,000). Although involving private banks is a step away from the untargeted distribution of public money, the presence of the interest rate cap might bias banks’ selection of debtors, leading them away from riskier but more promising projects. The Saudi Credit Bank (SCB) distributed the social loans to low-income Saudis as the main task, with SR 200,000 (USD 53,000) as the upper limit. SCB created a new loan program for SMEs, making credit available for limousine drivers and others, to encourage Saudis to start their own business (Hertog, 2010). Self-employment of Saudis through micro-projects is a promising avenue for job creation in a populous society that values independence and entrepreneurship. At least until recently, however, SCB program faced barriers with identifying its beneficiaries and enforcing repayment.

Major problems of small to medium enterprises. Most countries around the globe are encouraging the growth of SMEs in an effort to create jobs and improve the economy; however, market defects stem to delay growth (Ahmad, 2012). Despite

government support to SMEs, they did not achieve long-term sustainability because of many challenges and shortfalls. Researchers identified a list of challenges such as a lack of funding, lack of resources, lack of management, and technical skills and technology. Sadi and Henderson (2011) reported that SMEs face challenges related to restricted access to short- and long-term finance, a detrimental business environment, managerial inefficiencies, an underdeveloped information technology sector, not enough market information, and unfavorable market conditions. Therefore, small to medium enterprises often have difficulties in getting capital or credit in the initial start-up phase. In contrast, Rivas, Cano, and Austria (2013) indicated that more than 80% would survive after two years.

Banks deny giving new loans to SMEs in comparison to large firms. Ahmad (2012) proposed that self-funding and family or friends loans are a source of funding for start-up SME. SME leaders find it difficult to get bank financing, especially without credit guarantees for setting up and running their enterprises. As a result, SMEs become vulnerable to change in the supply and demand market economy. SMEs also face challenges with their human resources who need administrative and managerial experiences. Limitations in funding and human resources lead to weak and old technology implementation. The poor technology implementation leads to a shortage of information and analysis abilities. Overall, such limitations push away investors and bankers. Small to medium enterprises also suffer from limited availability of statistics and information that supports the decision-making process. Small to medium enterprises,



government, and funders should work cooperatively to find solutions that address these challenges.

In the Saudi context, SMEs present operational and development models that encompass family companies, start-ups, and spin-offs (Sadi & Henderson, 2011). Almahdi and Dickson (2010) identified limitations in resources, funding, management skills, training, and technology as main constraints. The five major barriers to growth of SMEs in Saudi Arabia are problems in getting financial support, bureaucracy, lack of credit choices, unfriendly business environment, and inadequate government support and help (Ahmad, 2012). Bahaddad et al. (2013) argued that SMEs are unaware that information technology improves business operations. Hertog (2010) contended that financing is a key challenge for SMEs worldwide, but it is stifling in emerging markets. Banks are reluctant to lend to SMEs, especially startups that end with rejected credit applications.

In Saudi Arabia, expatriates dominate SMEs' human resources. Sadi and Henderson (2011) associated certain weakness because of the large proportion of expatriate managers who play a confined role in long-term business development. Hertog (2010) noted that, for every job created for a Saudi, more than six jobs are for foreigners. However, work in the SMEs is not attractive because of low salaries compared to large companies, less attractive work conditions, lack of career paths, and employment security (Hertog, 2010). As a result, most SMEs suffer from staff turnover and limited-access to qualified and skilled staff. Saudi Arabia needs to tailor policies to fit the challenges arising from the population demographics (Hertog, 2010). Such

policies could create an enabling environment that supports developing SMEs and facilitate services.

#### Diffusion of Innovation and Technology

Technology and innovation drive economic growth. Oliveira and Martins (2011) argued that the impact of IT on productivity and economic growth appears when technologies diffuse. The spread of ICT went beyond the business environment and touched the lives of people. Information and communication technology implementations are not the end in mind, but rather a bridge to transform businesses and lives. Technology acts as a catalyst for change that keeps the economy and people working in a dynamic state. Information and communication technology is the lens through which companies achieve performance improvements. Companies started adopting ICT to increase productivity, improve social engagement, and internal as well as external development. The increased pace of technology adoption by society induced a need for systems. However, investing in more technology should align and integrate with organizational operations (Boothby, Dufour, & Tang, 2010). The adoption and incorporation of technology influence organizational change. IT-driven companies should ensure that they have the human capacity to implement new technologies. Integration of technology and skills of the human resources leads to increased chances of success and increase engagement (Boothby et al., 2010). Companies use diffusion process components like channels, time, and members of a social system to communicate innovation (Rogers, 2003). Rogers argued that the interpersonal communication with peers could speed up innovation diffusion. In agreement, Oliveira and Martins (2011)

contended that relationships and coordination between workers in small firms supported the diffusion process. Therefore, diffusion of innovation mandates joint efforts integrated with expertise. Creating platforms for innovation adoption involves funding and commitment.

Diffusion of innovation theory. Diffusion research seeks to explain why some innovations diffuse through a social system at a faster rate than others do. In the last 25 years, researchers focused on the selection and adoption of technology, and less on the acceptance, diffusion, and infusion of technology within a business (Moore & Benbasat, 1991). Scholars credit the work of Everett M. Rogers with developing most of the principles of diffusion of innovation theory research and being the pioneers in the field. The innovation-decision process involves various steps that start with the individual receiving first knowledge of innovation followed by having a position that supports taking decision to adopt or reject to implementation new innovations (Rogers, 2003). Rogers identified four elements of the theory of diffusion of innovation in adoption of technology that apply to social systems, companies, or individuals including: (a) innovation, (b) communication, (c) time, and (d) social systems. Rogers did not only address the technology side but rather introduced the concept of innovation. Rogers argued innovations could be tangible or intangible such as methodologies, processes, or new techniques. For the purpose of this study, the *ideas* are eHealth technologies needed by SMEs in the Saudi market.

The diffusion process could involve mass media and interpersonal communication channels to create awareness and build knowledge about the innovation. Rogers (2003)

described technology diffusion as a simple, linear model of communication. Discussions with peers allow relaying a new approach aiming at reaching some understanding or agreement. Another factor is the qualities of individuals and their response to the communications about the new approach. Rogers argued that taking decisions to adopt innovations need communication channels.

Researchers and scholars debated why companies adopt innovations and technologies. Researchers tried to identify the elements that affect the diffusion process, and its rate of adoption. Researchers used Davis' technology acceptance model (TAM) and Rogers's diffusion of innovation theory (DOI) in health related research. However, health care companies face challenges, because they did not understand the acceptance of technology until after implementation. The elements that predict what will affect an agreement are hard to generalize because of the different conditions and uses of these technologies across medical domains.

Attributes of innovation. Rogers (2003) proposed five attributes that affect the rate and likelihood of adoption. The five elements were relative advantage, compatibility, trialability, observability, and complexity. Rate of adoption depends on the individuals' views of these attributes. Some elements are inherent to the innovation, whereas others concern the adopters themselves and their use of the innovation.

***Relative advantage.*** Innovation should introduce improvements (Rogers, 2003). Companies that want to adopt an innovation should balance benefits and risk because higher levels of risk will induce resistance and tension. Moore and Benbasat (1991) pointed out that researchers should explore the following elements: speed of delivery and

accomplishment, quality improvement, ease of performing tasks, the net benefit of innovation, and degree to which it improves job performance, job effectiveness improvement, control overwork, and increase productivity. The innovation should display better performance, control cost, and differentiation.

***Compatibility.*** Rogers (2003) argued that companies adopt innovations that are compatible with their needs. Innovations will assimilate in a better fashion when aligned with top management goals. Moore and Benbasat (1991) indicated that the researcher should explore the following: compatibility with all aspects of work, compatibility with the work environment, and fit the work style.

***Complexity.*** Although Rogers (2003) argued that this attribute is of a less importance when compared to other attributes, it is a barrier to new ideas. Moore and Benbasat (1991) suggested that researchers should explore the following elements: belief that innovation is cumbersome to use, difficulty in remembering tasks a level of mental effort needed, the frustration level, clearness and understanding when interacting with innovation. DesRoches, Audet, Painter, and Donelan (2013) contended that the perceived ease of use was powerful in explaining computer use and satisfaction.

***Trailability.*** Trailability refers to the possibility of testing an innovation (Rogers, 2003). This attribute offered an opportunity to test, try, or simulate the innovation without any commitment to adopt it. It described a pull rather than a push strategy when introducing new technologies because it reduces uncertainty. Users are encouraged to adopt an innovation after testing it and experiencing its benefits.

**Observability.** Innovation results should be visible to others (Rogers, 2003). Adopters could see results that can stimulate their awareness and encourage them to adopt. Moore and Benbasat (1991) indicated that researchers should explore the following elements: difficulty telling others about the results of using innovation, ability to communicate to others results of using the innovation degree to which results were clear to the users, and difficulty in explaining benefits of using innovation.

The innovation-decision process. The innovation-decision process involves various steps that start with the individual receiving first knowledge of innovation followed by having a position that supports takes decision to adopt or reject to implementation new innovations (Rogers, 2003). Rogers (2003) proposed four elements that affect making decisions about innovations: (a) the type of innovation decision, (b) the nature of communication channels diffusing the innovation at different stages in the process, (c) the nature of the social system or business in which the innovation is diffusing, and (d) the extent of change agent promotion efforts in diffusing the innovation. Rogers proposed five steps for the process: (1) knowledge, (2) persuasion, (3) decision, (4) implementation, and (5) confirmation. All of these variables serve to explain the variances associated with the DOT and how companies adopt, reject, or abandon an innovation.

Innovation decisions types. Innovation decisions types include optional innovation decisions, where individuals made a decision to adopt or reject a new idea independent of others members of their social system (Rogers, 2003). Types also include collective innovation decisions with consensus among members of a social system to

adopt or reject an innovation or new idea, and authority innovation decisions where individuals with power, status or technical expertise decided to adopt or reject an idea or innovation. Rogers also included another category, *contingent innovation-decisions* where choices to adopt or reject, were reconsidered after an initial decision to not-adopt. Idea fast or slow adoption rate in a particular group is contingent on decision-innovation alternatives and the outcome of each alternative result in outcomes for individuals, units, or social system (Rogers, 2003).

Adopter categories. Rogers (2003) argued the rate of adoption differs among persons of a social system where adoption willingness. Rogers classified members into five categories called *ideal types* based on abstractions from empirical investigations. The five categories are innovators, early adopters, early majority, late majority, and laggards. In contrast, Oliveira and Martins (2011) identified five categories of adopters using DOI, and asserted that organizational innovativeness relates to the independent variables of individual (leaders) characteristics, internal characteristics of organizational structure, and external features of the company. In the health industry context, Rogers (2003) indicated that speeding up adoption require companies to understand the perfect types of health professionals and to design approaches for each type. Aleke et al. (2011) indicated that views of ICT adoption would differ among adopters. Develop a suitable adoption channel that ensures successful diffusion of the innovation is necessary. Rogers presented the innovators category as venturesome; the innovators take risk and go beyond local circle of peer groups that sometimes lead to low respect. Innovators play a role in introducing new ideas from the outside. In contrast, early adopters are more close to the

local companies, gain their respect, and serve as opinion leaders. The early majority adopts before the typical member of the system whereas the majority are hesitant to move forward (Rogers, 2003). Laggards will adopt after ensuring the implementation will succeed. To conclude, companies should analyze the views of potential adopters and plan for implementations accordingly.

Hybrid adapted models. A scan of the existing literature on technology adoption, acceptance and diffusion, as well as a review of research that exercise these models as theoretical frameworks, suggested that traditional theories such as TAM and DOI are limited in their original scope and must be extended before they can be applied to companies. Various researchers who tried to apply these models reported the need for experience related to medical technology adoption (Wainwright & Waring, 2007).

Sanayei, Ansari, and Ranjbarian (2012) posited that the diffusion theory addressed the attitudes toward an innovation but did not reflect on the dynamics of decision-making process. Diffusion of innovation (DOI) best explains how, why, and the rate at which new ideas and innovation spread through cultures (Oliveira & Martins, 2011).

Wainwright and Waring (2007) confirmed that a gap existed in extant theories about the social impact of new technologies on companies. The DOI theory provides explanations to firm level IT adoption but does not include the environmental context that takes note of constraints and opportunities for technological innovation. Health care needs are different, and no single existing model could explain technology adoption. Sanayei et al. (2012) integrated TAM and innovation diffusion theory (IDT) in a complimentary manner as they reconfirm the findings of each other. Therefore, the hybrid models



improved predictive and explanatory power because it covers more elements that affect the diffusion of innovation.

Based on an analysis of available technology adoption theories, Wainwright and Waring (2007) adapted DOI model fitted the objectives of this study best. The model has ability to assess technology acceptance, diffusion, and infusion over time rather than focusing on predicting positive adoption. The design was also relevant because its extensions to DOI included analysis of potential indicators like organizational and subjective norms.

#### Elements Affecting Diffusion of HIT

A set of elements delays the ICT implementation in Saudi Arabia. Al Merdah and Sadi (2011) examined the key barriers to technology transfer in Saudi Arabia and identified that barriers include: workforce skills, management capabilities, industrial infrastructure capabilities, legal and regulatory needs, financial access, economic conditions, technological levels, costs, and risks, marketing capabilities, and information resources. Another barrier is the cost of adopting an EHR system. The purpose of this section is to present the elements that affect the diffusion of HIT. This section includes an overview on the paradox about the benefits of technology. Decision makers struggle to take decisions whether to adopt or not adopt new technologies. Below, I will present a discussion about the elements addressed in this study such as the human resources, organizational leadership and alignment, clinical team role and power, and financing. The last section will include information about the challenges in the Saudi market. Addressing the elements that affect the diffusion of HIT in the Saudi context is important.

Information and communication technology implementation. The major barriers to establishing eHealth include complicated infrastructure, ability to attract expertise, funding resources, and weak implementation strategies (Altuwaijri, 2011). Many obstacles challenge eHealth & ICT implementations. Companies should provide funds, develop implementation strategies, address challenges of complicated ICT infrastructure, and expertise in eHealth. Expert resources support successful ICT implementations. The shortage of skilled health professionals to promote innovation affected developing and improving eHealth services (WHO, 2013). To ensure proper uptake of eHealth, providers need to accommodate the following elements: staffing constraints, system operator skills, training time available and cost limitations. Researchers should encourage feedback from users, no matter how significant; to develop a program that fits user needs (Black et al., 2011). Measuring the capacity of the team should identify the correction actions. Medical providers have to build staff capability and ensure that they participate in introducing new technologies.

Globalization mandated many SMEs to adopt ICT to survive in the competitive world. Information and communication technology exceeded its role as being just a support tool and helped SMEs to gain a competitive advantage with large counterparts (Ahmed et al., 2010) and reducing costs and improving core business processes (Apulu & Latham, 2011). With time, the ICT diffusion increased as SMEs realized its value. Badrinarayanan and West (2010) proclaimed that SMEs face difficulties in embracing new technologies. Ahmed et al. confirmed that the adoption rate of ICT in SMEs was slow. Ahmed et al. justified SMEs position by referencing large number of unsuccessful

implementations. Information technology specifies the abilities, capacities, and capabilities of the firms when it comes to IT adoption.

Various elements stand behind the delay in ICT implementation. Badrinarayanan and West (2010) argued that technology and environmental features, organizational, structural, and strategic elements affect technology adoption decisions. Many SMEs suffer from low levels of trust that owner or managers had in staff. Networking covers the relationships of firms with external environment including suppliers, customers, stakeholders, government officials, and research academics. Knowledge and learning from networking contributed to SMEs knowledge transfer and innovation. Ahmed et al. (2010) also identified the availability of training facilities as another factor to slow diffusion. Ahmed et al. concluded that SMEs know where to get training advice, but were not satisfied with the training provided. Small to medium enterprises should run like large companies and maintain flexibility for change and adaptation. Companies should set the right culture amongst staff to support the diffusion of new technologies.

Various elements affect ICT implementation in Saudi Arabia. Al Merdah and Sadi (2011) found that the key barriers to technology transfer involved workforce skills, management capabilities, industrial infrastructure capabilities, legal and regulatory needs, financial access, economic conditions, technological levels, costs and risks, marketing skills, and information resources. The top two barriers were workforce skills and management experience, followed by legal and regulatory needs (Al Merdah & Sadi, 2011). Other elements noted were the SMEs fear of loss of investment. To address such

challenges related to lack of IT expertise and SMEs' experiences, SMEs use outside expertise to fill the gaps.

Paradox of information and communication technology benefits. In the literature, no consensus exists on the strategic value of IT. Many firms could not distance themselves from competitors because of advances in IT. In concert, Ismail and Mamat (2012) posited that companies should define ICT adoption strategies while developing additional competencies ensure successful implementation. Lapointe, Mignerat, and Vedel (2011) added that the productivity paradox originated because of IT mismanagement, redistribution of profit, and measurement errors. However, not all IT-business alignment is productive for the firm because alignment might create a risk and often little or no return on investment (ROI). In contrast, other scholars provided empirical evidence that IT strategic flexibility and business-IT partnership provided an opportunity for companies to increase efficiency and effectiveness, and gain a competitive advantage (Ismail & Mamat, 2012). From a policy perspective, directing additional resources into eHealth initiatives had the potential to reduce health care cost and improve the health status of patients at the regional and national levels. Mithas, Tafti, Bardhan, and Goh (2012) contended that investing in IT will contribute to increasing revenue but not to reducing operational expenses. The debate about ICT value continues unless companies define and apply measures of success.

Dramatic reduction in the cost of achieving, processing, and transmitting information changed the way by which firms conduct business in today's technological environment. Thus, many firms in a multitude of businesses have little choice but to

implement some form of IT to remain innovative, and competitive. Organizations depend on IT functions to improve internal processes, business procedures, and increase profitability (Mithas et al., 2012). However, the adoption of information technology in the business environment needs a different set of techniques by business companies to plan for future success reflected in organizational performance.

Innovation does not disseminate instantaneously. Wainwright and Waring (2007) found that high-level politics influenced the diffusion process in small medical providers. Various economic and social elements need strategies to lessen any potential adverse effects on the DOT (Cappellaro, Ghislandi, & Anessi-Pessin, 2011). Aleke et al. (2011) added that various social parameters influence the effective adoption of ICT in small companies (Aleke et al., 2011). Aleke et al. found that the social antecedent is a trend for empowerment that acts as a direct relationship between entrepreneurial attitudes and orientation, and social imperatives. Social antecedent comprises of active social networks, within, and outside, personal networks. Ami-Narh and Williams (2012) indicated that the four core determinants of intention and use with up to four moderators of key relationships. The four key constructs, performance expectancy, effort expectancy, social influence, and facilitating conditions, affect plan to use. The key moderators in the model are gender, age, voluntariness, and experience. Tams, Grover, and Thatcher (2014) found that an older workforce is less likely to embrace and adopt technology in the workplace, but companies can override such challenge through encouraging frequent teamwork. To avoid delays in diffusion of ICT, companies should address the various elements that affect the implementation of ICT.

Many challenges of aligning IT functions and capabilities with business strategy are existent. Researchers need to explore reasons that affect IT-business alignment and to determine the reasons why the alignment gap exists between IT strategy and business strategy. Wainwright and Waring (2007) work was informative and reflected how DOI framework supports understanding how ICT innovation is politically constrained, perceived, and motivated within health care environments. Tarafdar and Qrunfleh (2009) suggested that researchers should address six aspects of tactical IT-business alignment, namely: communication-related, governance-related, skill-related, sourcing-related, IT expertise role-related and project related. The four tactical IT-business alignment results from the study are: implementation of planned use, allowing execution of IT-enabled aspects of business strategy, increased credibility of the IT function, and increased business value from IT projects. Chong, Ooi, Chan, and Darmawan (2011) also indicated that perceived organizational trust, perceived communications on business-IT strategies to employees and perceived knowledge on business-IT strategies have a positive and significant relationship with business-IT alignment of companies. Companies should align ICT implementations with their strategy.

Companies need to select the right ICT for the business. Attention should not be on elements that drive adoption, but also on parameters that drive the choice of technology (Aleke et al., 2011). Mogli (2011) identified a list of shortfalls under three categories such as team related, process, and technology. In contrast, McGrady (2010) identified the key issues that concern decision-makers like justifying the initial expense, developing the infrastructure, and training staff.

Low adoption rates associate with a web of economic, structural, organizational, and technical challenges. Lapointe et al. (2011) contended that HIT cannot grant the impact on quality of care and cost in most fields, including education, companies minimized the use of paper-based records, as a way of reducing costs and drawbacks, and health care is no different (Altuwajri, 2011). Characteristics of the health care system influence the DOT (Dünnebeil, Sunyaev, Blohm, Leimeister, & Krcmar, 2012). The increase in the HIT market presented new challenges that generated low IT adoption rates despite the achieved benefits (Adler-Milstein & Bates, 2010). Some hospitals adopt new information quickly while others lag behind. Spread of medical innovation is unique for many reasons. First, innovations with clear benefits will spread quickly, though, in medicine, true benefits are sometimes difficult to identify. Second, it allows seeing rewarding results by adopters. Third, because medicine deals with human life, not the production of goods, providers are wary of trying unfamiliar treatment. Despite these obstacles, medicine is one of the dynamic and innovative businesses, with pharmaceutical and medical device companies relying on a consistent and DOT by hospitals and providers. The health care sector has the potential to spread and apply new information and technology to medical practice yet some companies adapt faster than others do.

Contribution value of HIT is debatable. Cappellaro et al. (2011) argued that diffusion of HIT contribution to the increase in health care costs limited it. In contrast, Alkrajji, Jackson, and Murray (2011) contended that the adoption of health information technology would improve medical institution performance on the administrative and clinical sides. However, Mogli (2012) argued that implementation is complex and needs

intensive participation of various working groups. Therefore, DOT in health care needs attention to the end users need.

Individual adoption decisions differ in their ability to capitalize on the new health care technology. Applications should allow personalization by users to meet their needs. Tailored innovations according to the targeted audience increased the rate of eHealth innovations. For instance, an intervention designed for women living in urban areas may not be applicable to women living in rural areas. Some of the drawbacks to effective support include language barriers or computer literacy. Transparent and honest communication among the stakeholders in the health care centers will also help in averting rumors and gossip that may cause resistance and ruin the entire process of implementation.

The human resources factor. The objective of this section is to address the human factor and its influence on the development of companies. Building sustainable business companies and introducing innovations depends on human resources. In the health care field, human resources play a key role in HIT adoption. Alsafadi and Abunafes (2012) argued that the shortage of skilled resources hindered development, performance, and sustainable IT companies. Alzahrani (2011) contended that many Saudi companies suffered from a lack of trained personnel with enough ICT knowledge, experience, and skills to manage and use the information systems efficiently. Alsafadi and Abunafes (2012) reported that the cumulative gap of IT professionals would reach around 30,000 professionals by 2014. The main skill gaps are in technology-based skills, business, and soft skills. Alsafadi and Abunafes argued that many employers failed to



project their business. As a result, the employers' need for future skills dropped. Alzahrani (2011) associated the low ICT adoption with the lack of training programs and the lack of coordination among companies. Alghamdi et al. (2013) classified the inhibitors and enablers of ICT into the following groups: social issues, legislative infrastructure, financial infrastructure, logistics/post infrastructure, ICT infrastructure, and government support. In concert, Al-Hudhaif and Alkubeyyer (2011) assumed that slow adoption of ICT was a result of internal organizational elements and external set of elements related to infrastructure and governmental support. As the demand for ICT increases, companies should allocate expert resources to introduce ICT. Even if ICT is important for companies, it will not succeed without addressing challenges.

IT adoption should align with people's need. Boothby et al. (2010) contended that companies that provided strategic training to staff adopting new technologies were more productive. Boothby et al. argued that the right combinations of new technologies and training lead to higher productivity than adoption of new technologies alone. Bredfeldt, Awad, Joseph, and Snyder (2013) stressed the importance of training to increase the use of technologies efficiently. Aleke et al. (2011) argued that the use of technology remained limited after providing tools that facilitated information spread because of low literacy levels. Training should be technology specific because it relates to production efficiency (Boothby et al., 2010). Building expertise requires combining the right training with the right resources.

Companies should offer staff the best environment to share and engage in introducing innovations. Decision-makers who try to plan and strategize often ignore the

role and contribution of people in introducing innovations. Denstad and Bygstad (2012) argued that chief information officers (CIOs) should not take the IT-business strategy for granted. CIOs should know the position of the firm's organizational structure as it relates to IT-business alignment. This fact is dominant in SMEs because the numbers of resources are smaller, and teams work closely with top management. Chong et al. (2011) argued that managers have a major role in educating and communicating with employees to ensure that they have knowledge on the business-IT strategies. Empowering staff with information is a process that involves all staff levels. Boothby et al. (2010) contended that technology alone would not give the wanted results. Adoption of technology and associated training skills affect companies' productivity. Boothby et al. noted that experienced personnel would produce quality work and complement new technologies implementation. Learning new skills associates with successful new technology adoption. The use of technology would increase productivity (Lee, McCullough, & Town, 2013; Devaraj, & Kohli, 2013). Training is an alternative to learning new skills and might change user's attitude towards technology adoption.

Organizational leadership and alignment. Implementation of new technologies cannot succeed without leadership commitment and organizational alignment. Tarafdar and Qrunfleh (2009) argued that failed companies and financial losses are the result of nonalignment of tactical IT and business strategies. Gamble, Lorenz, Turnipseed, and Weaver (2013) argued that both owners and managers behave similarly concerning risk tolerance and aggressiveness. Planned applications alignment with the firm's business objectives leads to tactical IT-business alignment results and an increase in value from IT

projects (Tarafdar & Qrunfleh, 2009). Valorinta (2011) found that linking IT alignment with boundary management needs a continuous process of alignment to sustain IT-business value. Strategic IT flexibility and business-IT partnership have direct positive relationship with business competitive advantage.

Organizational elements affect the decision-making process of ICT implementation. Internal organizational elements are determinants for technology adoption decision (Al-Hudhaif & Alkubeyyer, 2011). The top determinants are the technology resources, followed by commitment, awareness, and governance. Tarafdar and Qrunfleh (2009) reviewed the literature on IT-business strategies and focused on four alignment approaches: alignment of structure and decision-making, social alignment, project alignment, and results of executive-focused alignment mechanisms. Chong et al. (2011) concluded that companies should build up the trust with employees in terms of the goals and business and IT strategies of the company. Aleke et al. (2011) noted that adopters had concerns on potential disruption ICT will have on normal ways of life. Such information improves understanding and sense making. Resistance against management and ICT can cripple the change process.

***Leadership role.*** Leadership contributes to successful ICT initiatives.

Technology implementation as a strategic move needs the direct attention and ownership of leadership (Hood, 2011). De Massis, Frattini, and Lichtenthaler (2012) argued that owner involvement may directly influence innovation activities. Badrinarayanan and West (2010) argued researcher should explore the role of top management and employees in forming strategic postures. Hood (2011) ascertained that the top management should

keep staff aware of the impact of technology implementation and communicate to them implementation road maps. Hood posited that management should align their objectives with successful implementation goals. In contrast, Valorinta (2011) asserted that a successful alignment of IT-Business strategies results from the effective collaboration between CIO and CEO in IT planning processes. Employees should understand set strategies to allow successful deployment (Chong et al., 2011). The interaction between CEO, CIOs, and IT organizational leadership is a key part of alignment. Leadership should be proactive in educating them about new technologies (McGrady, 2010). To achieve alignment, CIOs and top executives must understand the dynamics and processes that contribute to alignment.

Although personal values and the firm posture are two distinct constructs, it is possible to be interrelated. In a similar vein, leadership should examine the relationship between types of organizational culture and strategic postures. CEOs should associate technology to organizational success and sound financial results (Hood, 2011). Dwyer, Becker, and Hawkins (2010) recommended that medical providers should create certain frameworks, like committees, to oversee introducing new technologies, and increase the integration and alignment between management and clinicians. The success of HIT adoption and implementation is a matter of organizational culture (Cohn et al., 2009). Health care companies that welcome innovation, rather than view it as a threat can glean gains in quality, safety, and coordination of care. Companies should provide financial and administrative support.

Clinical staff involvement and participation. Clinical staff involvement in eHealth projects and acceptance is pivotal for the success of implementation. Participation of clinical staff presents a key part of the diffusion process because failing to develop user ownership will lead to failure. Although HIT brings benefits, many clinicians resist it because they view it as a time and money waster. Management should provide strategic direction and support to clinical staff involvement. Hood (2011) contended that the clinical and administrative staff skill set and competencies determine the success of technology implementation. Cohn et al. (2009) reported that around 50% of HIT efforts fail because of poor planning, miscommunication, mismanagement, overspending, and rejection by users. Successful implementations should involve clinicians from design to implementation.

Electronic health enhances the cooperation and data exchange between care professionals (Feldman & Horan, 2011). Bah et al. (2011) suggested that accepting the clinical team is the driver towards the success of EHR implementation. Bah et al. identified the unwillingness of doctors to use the EHR as barriers. Many emerging countries suffer from adopting ICT projects, and may not install the proper ICT infrastructure for the government deployment (Alghamdi et al., 2011). Companies need to deploy ICT infrastructure that is capable of accommodating business needs. In health care, ICT infrastructure is a pre-requisite for implementing EHR.

Introducing value encourages clinical staff to participate and support adding technology. Bah et al. (2011) posited that EHRs could improve the quality of care, promote evidence-based medicine, and improve the efficiency and effectiveness of care

delivery by clinicians. HIT proved that it could affect the scope of clinicians practice (Devaraj et al., 2013). Cohn et al. (2009) ascertained that clinical and economic arguments support the adoption of HIT. Electronic health records are helpful for health care professionals because patients are keen on improving health care services after implementing EHR (Menachemi, 2011). Cohn et al. noted that HIT benefits could also offer an opportunity for patient-physician partnership, decision support for clinicians, access to and storage of medical and patient information, and reduction in filing, transcription, and staffing costs, and decreased duplication. Cohn et al. extended their argument noting that many physicians are hesitant to switch to an electronic system because of disenfranchisement, bad medicine, and bad economics. Many clinicians believe that HIT produces bad medicine because it might increase medication errors if poorly designed, promoted as a cure for all the ills of modern medicine, promotes bad habits that will lead to an accurate diagnosis (Cohn et al., 2009). However, patients like their physicians to have information about their health to identify the best treatment available based on the current condition and patient history.

In Saudi Arabia, health professionals consider the instability of vendors and software providers, patient confidentiality and privacy, lack of experience with the use of computers, lack of quality, security in the access and use of eHealth systems, lack of adoptions of uniform standards, and system maintenance and downtime as barriers. Bah et al. (2011) noted that the challenges faced in implementing HIT were lack of seriousness of the nursing staff in writing progress notes, and unwillingness of doctors to write the initial diagnosis of patient's condition. However, some modules present in the

EHR system were underutilized (Bah et al., 2011). Bah et al. referred the underutilization to security related issues, workload of physicians, and the minimal social valuation of patients' rights and low degree of patient empowerment. The health care professionals ICT viability understanding and attitude affect DOT patterns. Clinical staff should engage in the ICT implementation process.

Involving clinical leaders with experience or interest in informatics allows them to serve as liaisons with other clinical practitioners. Clinical leadership permits ongoing feedback from physicians before, during, and after EHR implementation. Treating physicians as customers and considering their needs throughout the entire process is essential. Cohn et al. (2009) concluded that successful HIT implementation should stress on the goal to meet the *five rights* of technology. The five rights are the right information at the right time to the right person in the right format and the right medium. Cohn et al. noted that the success of the implementation was a result of planning, enough resources, and logical structure for change. Communication between physicians and opinion leaders is critical, as inadequate communication is a core reason cited for system failure. Nurses could play a determinant role in informing decision-makers of the sociopolitical contexts and issues that affect the diffusion of health care technologies. Companies should pay attention to the details before the implementation, including selecting the HIT systems, forging a vendor relationship, negotiating process, preparing physicians, and the planning the go-live date and beyond (Cohn et al., 2009). Change happens with the creation of a vision for change in alignment with clinical staff empowerment.

Medical providers who plan well are better ICT adopters. Mogli (2011) argued that hospitals that planned well had a smooth transition. Mogli found that medical institutions faced difficulty in the transition to EHR because of unplanned process, lack of commitment, lack of qualified health IT, and medical records staff. Medical providers' engagement in ICT implementation starts in the planning.

Budget and finance. To increase the diffusion of health care technologies, companies should increase the number of adopters by being cost-effective at the level of the individual adopter. Many researchers suggested that containing cost increases benefits and net gains. Ami-Narh and Williams (2012) argued that health care companies in the developed nations make investments in eHealth in order to achieve competitive advantage. Saudi Arabia, same as many countries, prioritized developing eHealth and allocated USD 1.07 billion toward eHealth programs for the 4-year period from 2008 to 2011 (Bah et al., 2011). Adler-Milstein and Bates (2010) argued that companies could glean several benefits from implementing HIT like improving quality of care and reducing cost. Many companies try to leverage ICT to improve access to populations and to increase productivity and innovation in the public and private sectors. However, financial constraints had a greater impact on private companies seeking profit (Cappellaro et al., 2011). In agreement, Cohn et al. (2009) portrayed the results of a survey showing that around 40% of surveyed physicians listed inadequate financial resources as the biggest impediment to implementation and 20% as lack of buy-ins. Financial planning should align with ICT initiatives that assist in achieving set financial targets.



Electronic health competes for resources with other elements of the care system that are important for patient care. Although investor perceives the net investment in Electronic health with a negative financial return, Schweitzer and Synowiec (2012) outlined potential areas for saving cost and increasing efficiency. Although some companies believe that eHealth show positive return on investment (ROI), they find difficulty in reflecting that to stakeholders (Khurshid, Diana, & Luce, 2012). Electronic health could produce a positive return on investments and attract funding in a competitive financial environment. Schweitzer and Synowiec (2012) identified eHealth opportunities for reducing costs and increasing efficiency inpatient registration, creation of a persistent record, payment services, remote diagnostics, scheduling, disease surveillance, management and administrative performance, and communications. Schweitzer and Synowiec contended that creating persistent records improved speed and efficiency of care delivered and reduced duplication of work. Schweitzer and Synowiec argued that remote diagnostics reduced clinic visits, saved time, improved patient triage, and allowed efficient use of time of skilled health workers. Administrators could review the performance, manage and communicate with staff, and efficiently manage the supply chain. Although some researchers claimed that ICT adds up to the health care cost, Schweitzer and Synowiec concluded that eHealth technology deployment could balance health care costs for poor, underserved populations. All medical providers strive to improve clinical outcomes and ICT proved to be a tool that can assist in improving clinical outcomes.

Information and communication technology could increase health care spending. Health information technology offers an array of benefits as well as its contribution to increased health spending (Peiró & Barrubés, 2012). Peiró and Barrubés (2012) associated the increase in health spending, which ranges between 33% and 50% with the diffusion of new technologies. Increasing demand and use of services, inflating medical costs, low efficiency, and accumulated debt also increase health care spending. McGrady (2010) argued that new technologies may be disruptive and might not achieve economic expectations. McGrady noted that usefulness and cost-benefit are the evaluation elements for companies. Extending this argument, Peiró and Barrubés (2012) suggested that technology could increase population targeted for treatment, unnecessary prescriptions, and indications for inappropriate medical treatment. Misalignment of ICT initiatives with the business needs would produce adverse effects.

With the increased focus on justifying strategic and tactical expenditure, estimating a connection between strategic investments of resources and ROI could prove necessary. Lapointe et al. (2011) argued that the investment in eHealth could result in negative results noting that not less than 2.6% to 6% of health budgets dedicated IT. Guiding SMEs to adopt a specific posture requires studying the link between a strategic posture and financial and market performance (Badrinarayanan & West, 2010). Adler-Milstein and Bates (2010) argued that medical providers must balance the level of customization needed to decrease disruptive implementations and the associated costs. In addition to the uncertainty in ROI, Adler-Milstein and Bates identified the lack of trained staff to support IT implementation as a major challenge.

The differences in procurement and funding mechanisms create incentives that may have an impact on the uptake and diffusion of technologies. The cost of innovation is a barrier (D'Este, Iammarino, Savona, & von Tunzelmann, 2012; Zhu, Wittmann, & Peng, 2012). Indirect costs associated with adoption are substantial. In contrast, Adler-Milstein and Bates (2010) suggested that increasing investment in HIT could lead to an increase in the rate of HIT adoption. The nature and form of technology determine the responsiveness to financial incentives (Cappellaro et al., 2011). Private for-profit medical providers react quickly and radically to financial incentives.

**Saudi specific elements.** In Saudi Arabia, the medical providers started realizing that technology can have an impact on quality of health care. However, not all sectors coped with changing demands. The Arab countries face barriers that hinder the diffusion of Internet and electronic commerce (Zeglat & Alzawahreh, 2012). Ahmad and Agrawal (2012) indicated that companies in implementing e-commerce solutions face multifaceted problems. Alzahrani (2011) argued that Saudi companies suffer from the lack of coordination within and between companies, as well as issues associated with technical, behavioral as structural elements. Quality of the Internet and its relative advantage also had an effect on e-service use and adoption in Saudi Arabia. Ahmad and Agrawal reported that more than 80% of the business establishments faced the obstacle of absence of supporting business laws. Social constraints, digital illiteracy, absent enabling environment, and limited knowledge about the potential for ICT applications especially with decision-makers add to the problem (Ahmad & Agrawal, 2012). Al-Ghaith et al. (2010) found that complexity, relative advantage, and compatibility predicted technology

adoption. Medical providers' perception on HIT changed; however, integrated efforts ensure successful HIT implementations and avoid obstacles.

Security issues present an obstacle to DOI. Al-Ghaith et al. (2010) suggested that elements influencing adoption included new technology adopter features, trust, security, privacy issues, and e-services quality. Zeglat and Alzawahreh (2012) also found that security is one of the issues affecting the development of electronic commerce in the Arab world. Al-Ghaith et al. contended that privacy and compatibility follow perceived complexity in significance. Perera, Holbrook, Thabane, Foster, and Willison, (2011) argued that providing patients with online access to their records creates new requirements to ensure protection of the data privacy and access control. Perera et al. stressed the need to address, minimize, and monitor the risks of losing health information privacy. In contrast, Ahmad and Agrawal (2012) purported that lack of supporting business law for e-commerce, care for cybercrime, data security and privacy, and difficulty in integrating e-commerce with existing systems are major barriers. Therefore, regulations could eliminate information security risks.

Small to medium enterprises face difficulties and suffer from limited access to short and long-term finance, a detrimental business environment, managerial inefficiencies, an underdeveloped information technology sector, inadequate market information, and unfavorable market conditions (Sadi & Henderson, 2011). Al Merdah and Sadi (2011) study results showed that the top two elements are workforce skills and management capability as reported by 38% and 27% respectively. Legal and regulatory requirements followed by 17%. Al Merdah and Sadi concluded that SMEs in Saudi

Arabia face lack of workforce skills, management capabilities, and effective legal and regulatory procedures. Alzahrani (2011) reported that the distribution of IT related employees in the private sector is 40% in 'network' division and 48.1% in software. Sadi and Henderson associated certain weakness because of the proportion of expatriate managers who play a circumscribed role in the long-term business development.

Building eHealth platforms necessitate integration of efforts. Elements such as the rising cost of health care delivery and drugs, inefficiencies in operations, and increased diffusion of HIT triggered the transformation of health care delivery systems into a new context (Peiró & Barrubés, 2012). Alkraihi et al. (2011) argued that Saudi Arabia is not yet ready e-health because the country lacked the fundamental attributes to set a national health information network. Bah et al. (2011) indicated that developing eHealth relates to many elements: the level of development in the country, the level of IT use, the level of education, the willingness to apply IT solutions to everyday problems, the knowledge about quality and the need to develop it, and respect for timely information. The maturity of the Saudi eHealth system is low, but a plan with limited implementations to adopt eHealth is in place. The Saudi government officials will allocate around USD 1.1 billion over the next four years to support the adoption of HIT (Alkraihi et al., 2011). Using different systems requires an effort to integrate with each other. Electronic health will not prosper unless all stakeholders join efforts to create an integrated information network.

The DOI theory is relevant and suitable to study the adoption of IT-related standards. Alkraihi et al. (2011) conducted a thematic analysis and identified 18 elements

that have an impact on the adoption process of HIT. The elements included network externalities, external pressure, integration, data analysis, accreditation, standards benefits, business structure, policy and procedures, business readiness, clinician engagement, external support, standards features, information, immaturity of health data standards industry, shortage of national experts, lack of national plans, and lack of recognized bodies.

### Transition and Summary

Section one provided preliminary background information on the business problem of slow diffusion of health information technology in medical providers SMEs in Saudi Arabia. I selected a qualitative, phenomenological study to explore the elements restraining the growth of medical providers SMEs because of the slow diffusion of health information technology. The first section presented a review of the literature that surrounds and theoretically supports the constructs that formed the basis for this study. The first section included a description of the Kingdom of Saudi Arabia, its economy, health care delivery system, ICT, and the role of SMEs in supporting and diversifying the national economy. The literature review also included the definition of SMEs, role in the economy, and their support to growth private health care sector business. I also examined the status of SMEs in Saudi Arabia with a special focus of on implementing ICT in SMEs and the major problems they faced. I stressed the need for an adapted hybrid model that can address the dimensions of HIT implementation in the health care industry. The literature review also provided insight into HIT evolution and its role in

transforming the health care industry. I identified various forms and applications of eHealth and examined their impact on access, quality, and cost.

Discussing the elements that affect the diffusion of HIT concluded Section one. A review of the extant literature included viewpoints on the paradox of ICT benefits and the divide between the health professional on ICT value in health care. I detailed the role of human resources and the financials. In relation to human resources, special reference was given to organizational and leadership aspects. In addition, I explored the role of clinical teams to find out how they affect the diffusion process. The literature review also explored the elements affecting the DOT in the Saudi context.

The next section contains insight into the nature of the study; research method and design, the participants, and the research project flow. The research methods describe the: (a) data collection, (b) interview data, (c) data analysis, (d) the study's reliability and validity, and (e) data presentation. Section 3 presents the study results and findings as well as their application to professional practice and implication for social change.

## Section 2: The Project

This section includes the approach followed to collect and analyze data. The purpose of this qualitative phenomenological study was to collect data from Saudi SME leaders such as administrators, medical directors, IT directors, and finance directors. The objective was to identify and explore elements affecting the DOT. Face-to face semistructured interviewing was the main method to collect data from SME leaders to identify the reasons behind the slow DOT at Saudi SMEs. Results may give a better understanding of how to develop the SME's role in the Saudi economy.

### Purpose Statement

The purpose of this qualitative phenomenological study was to explore the strategies SME medical provider leaders need to address operating inefficiencies associated with technology implementation. Knowledge is the first step in the innovation adoption process (Rogers, 2003). Exploring the strategies associated with the technology implementation process may inform SME leaders on pathways for accelerating the diffusion of technology. The population for this study was SME leaders such as owners, administrators, medical directors, IT directors, and finance directors. A purposive sample of at least six to 12 participants was suitable for this study (Ando, Cousins, & Young, 2014); however, the minimum number of participants for this study was 20 to satisfy Walden University's requirement. The study included SMEs from Riyadh City in Saudi Arabia. Face-to-face, semistructured interviews provided the means for collecting data addressing the research question.



A company can achieve a successful, value-driven approach to enable the effective use of technology and management of organizational change and technology implementation by combining the right people, processes, and technology. The results of this study might guide SME leaders to implement strategies that address the elements that affect the diffusion of technology. Findings from this study might assist SME leaders to be effective in introducing and successfully leading technology projects. Recommendations from the study might contribute to social change through improving the health care field through enhancing quality, access, and affordability of care.

#### Role of the Researcher

In this qualitative study, I was the data collection instrument (Sinkovics & Alfoldi, 2012). Peredaryenko and Krauss (2013) argued that the researcher as an instrument is a type of complex adaptive system. Researchers bring their own predispositions, assumptions, and beliefs to the research setting (Peredaryenko & Krauss, 2013). Researchers should have self-awareness to manage such predispositions, assumptions, and beliefs (Elo et al., 2014). Conducting a qualitative study requires a skilled researcher who can facilitate, moderate, listen, observe, interpret, and analyze. Researchers should comply with the three ethical principles established by the Belmont Report that include justice, respect for persons, and beneficence.

In this study, I collected, organized, and interpreted the data and results. Previous researchers provided insights into general attributes of the DOT at service provider SMEs as well as the expected result of different elements such as organizational features, leadership, financing, and clinical teams. In this qualitative study, I sought insight into

the research problem from the participants' view. I collected data on participants' feelings, thoughts, and experiences that address the phenomenon under study. I used semistructured interviews to reduce potential bias (Elo et al., 2014).

Establishing evidence begins with the researcher's perception (Moustakas, 1994). The 19 years of experience I had in the health care management field, including 13 in the Saudi market, enabled me to work with a number of service provider owners and top executives. I also had good relationships with the regulatory officials who worked to introduce standards that support and organize the electronic interchange between service providers and payers. I engaged in launching the first portal for health care data interchange in Saudi Arabia. My experience and involvement in the field posed a risk of bias in collecting and interpreting the data. As a result, I needed to mitigate any bias or preconceptions because of previous experience and existing involvement in the field of study. To mitigate this bias, I adhered to the interview protocol and avoided any deviation from the research questions.

Although researchers use their experience, training, connections, and social position to understand data, there is a general recognition of the nonobjectivity of these techniques (Bluhm, Harman, Lee, & Mitchell, 2011). Bluhm et al. (2011) argued that it would be impossible for researchers to detach and isolate themselves from their own reality. I needed to isolate my personal views to prevent my bias from directing responses from participants. The researcher should not steer the participant's answers to obtain inductive data (Elo et al., 2014). Barbour (2010) warned that the researcher might face situations of bias when a relationship with the participants exists. Such situations

might jeopardize the integrity of the research. Barbour suggested that the researcher should remain a passive observer to acquire accurate and nonjudgmental feedback. The researcher should remain focused to collect the information at the required depth without influencing the views articulated (Barbour, 2010). In contrast, researchers may extract rich information from the participants if they use their personal experiences and understanding of the phenomenon under study when interacting with the participants (Peredaryenko & Krauss, 2013; Schultze & Avital, 2011). However, researchers should not be preoccupied with their own predispositions, which might reduce the interaction with the participants or guide their responses. I ensured that I maintained focus on the study's scope and considered time limitations. I also assessed any potential bias by testing the suitability of interview questions and examining interview recordings for any attempts to manipulate or lead the participant (Elo et al., 2014).

### Participants

The participants were a homogeneous group of SME leaders such as owners, administrators, medical directors, IT directors, and finance directors. The strategy to gain access to the participants was through personal and professional relationships. I asked my business colleagues to contact the selected SME leaders over the telephone to present the study objectives and gauge willingness for cooperation. After the initial introduction and preliminary verbal participation approval, I sent the consent letter (Appendix B) to each participant. In the consent letter, I outlined the purpose of the study, the intended outcome, and the needed participants. The signed consent letter served as proof that participation was voluntary with the right to withdraw from the study. Before conducting

the research, I sought and earned approval 03-12-15-0288242 from Walden University's Institutional Review Board. The study document included information about the professional experience of participants, years of experience, nationality, and age. I included this information to identify commonalities and threads relating to business and demographics. Before interviewing participants, I re-informed them of the voluntary nature of their participation and their ability to withdraw at any time. I also re-informed them about the methods for data collection, storage, analysis, reporting, and demonstrating that collected data would remain protected and confidential. I mentioned I would not share the responses from the semistructured interviews with any other participant or member of the company.

Following Patton's (1990) recommendation, I selected homogeneous purposive sample of experienced participants who could inform me about this study's problem. The homogeneous sample reduced variation, simplified analysis, and facilitated interviewing (Patton, 1990). The recommended purposive sample for this phenomenological study was at least 20 participants (Ando, Cousins, & Young, 2014). Guest, Bunce, and Johnson (2006) argued that the purposive sample meets saturation when new information produces little or no change to the codebook. I started with six participants until saturation occurred with at least 20 participants. Saturation occurred with 12 participants. To ensure saturation, I checked for new themes each time I completed six interviews and conducted further interviews until collected data became redundant and no new themes emerged. The more homogeneous the interview structure, content, and population, the sooner saturation occurs (Guest et al., 2006).

To avoid any bias from a single site selection, I choose each participant set including owners, administrators, IT directors, and finance directors from a different SME located in the City of Riyadh in Saudi Arabia. The selected SME leaders had fewer than 100 employees to satisfy the SME's classification by SAGIA. The SME leaders were a homogeneous group who possessed a high degree of competence in their domain. The participants had direct or indirect control over the diffusion of the technology. To mitigate the staff turnover in the industry, all participants had a minimum of 3 years of experience in the Saudi market to ensure accurate information in the Saudi health care business context.

#### Research Method and Design

The purpose of this doctoral research study was to explore the elements that may contribute to the slow adoption of technology and innovation at service provider SMEs in Saudi Arabia. I explored the lived experiences of decision makers such as top executives, IT directors, and physicians at SMEs in Saudi Arabia. Through this qualitative phenomenological research design, I identified and explored strategies used to facilitate the DOT in SMEs.

#### Method

Bluhm et al. (2011) and Devers (2011) reported that qualitative methods have received increasing attention over the past decade. Researchers concerned with the opinions, experiences, and feelings of individuals producing subjective data use this method (Moustakas, 1994). Weiner et al. (2011) argued that qualitative methods could answer questions by a complementary set of methodological tools and rigorous empirical

research. Qualitative research is interpretive in nature, dealing with qualitative data that originate from natural settings and individuals' perceptions and experiences (Erlingsson & Brysiewicz, 2013). The focus of phenomenological researchers is not statistical relationships but rather lived conscious experiences (Van Manen, 2007). Van Manen (2007) argued that researchers may explore the views of people taking into account how they experience different situations. Qualitative researchers can offer a view on the DOT at medical SMEs because they explore patterns based on the views of the health care industry professionals, which enables an understanding of the context.

Qualitative data collection and analysis methods vary (Bansal & Corley, 2011; Weiner et al., 2011). Researchers benefit from the myriad of data collection possibilities and flexible analysis techniques that allow them to study a phenomenon (Weiner et al., 2011). Bluhm et al. (2011) indicated that a qualitative researcher uncovers experience processes and causal mechanisms through a wide array of methods. Weiner et al. (2011) argued that the qualitative researcher embraces a variety of traditions or modes of inquiry. Researchers conduct the analysis in a variety of ways, depending on the research purpose (Bansal & Corley, 2011). Bluhm et al. (2011) described qualitative research as being reflexive because data gathering and analysis change as the research situation unfolds. Qualitative research methods offer researchers the means to modify the research track during the research.

Qualitative researchers contributed to developing a body of management knowledge (Bansal & Corley, 2011). Bluhm et al. (2011) associated the growth of qualitative research with its research design, transparency of methods and analysis, and

theoretical goal. Bluhm et al. argued that quantitative research methods are better suited to address questions of prevalence, generalizability, and calibration, whereas qualitative research methods allow researchers to address issues of description, analysis, and explanation. Bluhm et al. indicated that researchers follow a qualitative research approach to understand personal experiences and a phenomenon. Quantitative research methods allow for generalizing of individuals' experiences to a larger population (Thomas & Magilvy, 2011). Qualitative researchers emphasize the subjective qualities of lived experiences in an inductive process that contributes to theory development (Peredaryenko & Krauss, 2013).

Many elements originating at the professional, organizational, and regulatory levels affect technology diffusion (Al Merdah & Sadi, 2011; Al-Hudhaif & Alkubeyyer, 2011; Altuwaijri, 2011; Badrinarayanan & West, 2010; Hertog, 2010; Sadi & Henderson, 2011). To understand a complex phenomenon, researchers must consider the different realities experienced by the participants (Erlingsson & Brysiewicz, 2013). Understanding relations at different levels and interpreting results constituted the core of this study. The research design allowed for the capturing of data that shape the problem. The qualitative approach was a better fit for the study because my purpose was to explore the subjective perspectives of SME executives (Moustakas, 2004). Weiner et al. (2011) contended that qualitative methods were successful to explore key domains and issues in the health care industry, covering a list of core areas related to policy, management research, organizational efficiency, and innovation. Qualitative methods are useful for developing rich, detailed descriptions; studying the interplay of action and context; exploring new or

emerging phenomena, and forming theoretical insights (Bluhm et al., 2011). Findings from qualitative research may provide a different perspective on the DOT in medical SMEs.

I considered a mixed-method approach for this study. Mixed-methods research involves both qualitative and quantitative methods (Venkatesh, Brown, & Bala, 2013). In a mixed-methods approach, the researcher must integrate qualitative and quantitative components into one study (Venkatesh et al., 2013). Wisdom, Cavaleri, Onwuegbuzie, and Green (2012) explained that mixed method are suitable when a quantitative or qualitative approach is insufficient by itself. The purpose of this study was to explore the strategies SME leaders need to accelerate the DOT. Using a quantitative approach would not yield the in-depth detailed information about the participants' experiences as they pertain to the DOT. The qualitative research method alone was a sufficient data collection method to address the purpose of this study.

#### Research Design

A qualitative research method with a phenomenological design was suitable for this doctoral study. Many elements contribute to the low DOT among service provider SMEs (Al Merdah & Sadi, 2011; Al-Hudhaif & Alkubeyyer, 2011; Altuwaijri, 2011; Badrinarayanan & West, 2010; Hertog, 2010; Sadi & Henderson, 2011). As a result, I favored a phenomenological design for this doctoral study. Selecting a phenomenological design was consistent with Wainwright and Waring's (2007) conceptual framework designed for phenomenological analysis of technology adoption within small medical companies. Using a phenomenological design was also consistent



with Gutiw's (2011) study on infusion of medical systems. I selected a phenomenological design for this doctoral study rather than other qualitative designs such as a case study, grounded theory, ethnography, or a heuristic research based on the study's purpose of analyzing human experience related to a particular phenomenon.

A phenomenological approach allows researchers to study lived experiences (Moustakas, 1994). The phenomenological approach is sufficient to explore patterns based on the views of the health care industry professionals. The phenomenological approach is suitable for the exploration of the views of SME executives and clinical staff about the DOT and innovation (Wainwright & Waring, 2007). The phenomenological approach also enables learning about the problem from the participants (Moustakas, 1994). The views of SME executives and clinical staff represented the main driving force behind decision making.

A phenomenology approach is a proper tool for extracting information from health care workers (Gutiw, 2011; Wainwright & Waring, 2007). A phenomenological study of the lived experience of primary care physicians could inform about health care operational issues (Weiner et al., 2011). Wainwright and Waring (2007) also contended that a phenomenology approach to study the DOT in health care would provide a rich analysis of the data, with the ability to develop conceptual themes into broader groupings. I collected data through face-to-face semistructured interviews. The phenomenological approach was suitable for the study because I explored the subjective perspectives of SME executives regarding potential elements not yet discovered for quantitative

measurement and testing (Moustakas, 1994). Sampling was purposive rather than randomly selected.

### Population and Sampling

Moustakas (1994) argued that with purposive sampling researchers recruit participants based on their knowledge and experience about the phenomenon of study. A sample between 5 to 50 participants was suitable for this study (Dworkin, 2012). Moustakas (1994) also recommended conducting a small number of interviews. The population for this study was SME leaders such as owners, administrators, medical directors, IT directors, and finance directors. The study included SMEs from Riyadh City in Saudi Arabia. All participants had a minimum experience of 3 years in the Saudi market to ensure accurate information in the Saudi health care business context.

Leadership and clinical teams play a role in an HIT implementation success. Organizational alignment, clinical team, and leadership commitment are ingredients for the success of HIT diffusion. Leadership and clinical teams should own and sponsor HIT projects. Hood (2011) contended that technology implementation needs the direct attention and ownership of leadership. Badrinarayanan and West (2010) argued that researchers should explore the role of top management and employees in forming strategic postures. In concert, clinical teams should engage in design and implementation because their agreement is pivotal for the success of implementation (Bah et al., 2011). As a result, clinical involvement could prevent about 50% of the failures in HIT implementations (Cohn et al., 2009; Mogli, 2011). Organizational and ownership structure, leadership defines SMEs (Ahmed et al., 2010). Bahaddad et al., (2013)

contended that SME leadership has the power and decision-making authority. The population for this study was SME leaders such as owners, administrators, medical directors, IT directors, and finance directors.

Qualitative research offers intensive comparisons and contrasts in sampling strategies. The goal of using purposive sampling techniques was to choose participants who could provide feedback that informs the study. Patton (1990) confirmed that purposive sampling offers strength in selecting information rich participants for study in-depth, with an underlying focus on selecting participants who will provide information for the questions under study. The participants informed the study in a way that provides feedback from presenting different perspectives about the phenomenon under study.

Purposive sampling has different strategies. Patton (1990) identified 16 sampling strategies types of purposive sampling procedures such as: (a) typical case sampling, (b) extreme, or deviant case sampling, (c) intensity sampling, (d) maximum variation sampling, (e) homogeneous sampling, and (f) reputational sampling. Purposive sampling techniques allow producing representative cases, as well as producing contrasting cases. Maximum variation sampling allows researchers to capture a wide range of perspectives relating to the phenomenon under study; that is, maximum variation sampling is a search for variation in perspectives, ranging from those conditions that are regular through those that are extreme in nature (Patton, 1990). Having a better view helps the researcher to identify common themes that are obvious across the sample. Homogeneous sampling facilitates group interviewing (Patton, 1990).

In this study, I used homogeneous sampling complemented with data saturation to justify the sample size because I sought to understand a small group in-depth (Patton, 1990) and see how people see and understand the phenomenon, in different settings and at different times. Data saturation is useful in qualitative research where the appropriate sample size is a function of the purpose of the study, and the range and distribution of experiences or views of interest (Guest et al., 2006). Collecting data continued until no new themes emerged (O'Reilly & Parker, 2012; Suri, 2011). Suri (2011) contended that the likelihood of reaching data saturation is higher if the data collection is purposeful. Selecting a small homogeneous number of participants covering a variety of positions and perspectives about a phenomenon could maximize the diversity relevant to the research question. Homogeneous sampling focuses on simplifying and reducing the variation. In phenomenological research, researchers seek detail through in-depth interviewing combined with detailed and thorough analysis.

#### Ethical Research

I protected the rights and interests of participants and avoided putting any participant in jeopardy at any time during the study. I employed strategies to protect the privacy, identity, and confidentiality of the participants. Ethical principles should guide conducting researches involving human subjects (Moustakas, 1994). Ethical considerations and procedures included a participant consent and withdrawal process, disclosure of incentives, data protection and storage, and compliance with Walden University's IRB guidelines.

To promote the participation process, in the Consent Letter (Appendix B), I outlined the purpose of the study, role, and responsibilities of the participants and researcher, and assurance on the participant confidentiality and anonymity. After getting approval 03-12-15-0288242 from the Institutional Review Board (IRB) of Walden University to proceed with the study, and before conducting the interviews, I obtained signed consent forms from the participants. The consent forms included statements about the voluntary nature of participation, the right to withdraw at any time, and the right to refuse to answer any question that represents a risk for the participant. I provided my contact information to all participants in case they needed to address any rights or privacy questions or concerns.

A copy of the Ethics and Confidentiality Disclosure Consent form is included in Appendix B. I sent the participants the consent form for review before their interviews. I reconfirmed the contents of the consent form in person before each interview, and asked each participant to sign the form. I emphasized the voluntary nature of the participation with the ability to withdraw at any time without any penalty. I also removed all identifying information before the transcribing process. I was the only person who transcribed the data and had access to the interview recordings. I conducted all interviews in privacy without interference. I used pseudonyms to conceal the participating service provider SMEs' and participants' names. Using pseudonyms allowed me to protect the privacy of participants and maintain their right to confidentiality by concealing their names. I did not offer any incentives, compensation, or other inducements in return for participating in the study. I gave the participants the

opportunity to receive, at the participant's sole discretion, a copy of the completed study results.

I encrypted all data files related to the study, including a scanned copy of signed consent forms and other approval documents. I saved data on a portable hard disk protected with a password. I will keep the hard copy consent forms and the hard disk in a fire resistant safe for a minimum of 5 years to protect the rights of participants. I will delete all electronic versions from my computer after 5 years have passed. I will also delete all files stored on the portable hard disk by using the disk utility application and a program with US Government security standards that will delete files permanently.

#### Data Collection

In phenomenological studies, the interview is the primary source of data collection and field notes and observations noted during the interview complement the interview method (Moustakas, 1994). Bluhm et al. (2011) argued that researchers should employ different data collection methods. In this study, I used an interview protocol to collect data, and details will follow in the coming subsections.

#### Instruments

In this phenomenological study design, I was the principal data collection instrument (Peredaryenko & Krauss, 2013). The researcher should apply a suitable data collection instrument that can lead to reliable and valid results Bluhm et al. (2011). I used semistructured interviews to collect the data (Elo et al., 2014). In a similar study, Ceci and Iubatti (2011) used a questionnaire to study the behavioral attitudes of building owners and their perception of sustainability while conducting a qualitative study. The

literature review guided the construction of the open-ended interview questions based on the conceptual frameworks of human resources, organizational leadership and alignment, clinical team role and power, and financing. Interview questions listed in Appendix A, Elements Contributing to Technology Diffusion, facilitated collecting input from participants. I applied an interview protocol for asking questions and recording the answers. Digital recordings of the interviews maintained a work reference for reliability of the data collected by comparing the transcribed data to the recordings. To assure the validity of the interview data, I used data saturation to ensure identification of all emerging themes.

To check the accuracy and validity of the semistructured interview questions before conducting the interviews, I asked for expert validation (Moustakas, 1994). This allowed me to reword the interview questions properly in order to avoid ambiguities. Two professionals in health care did a review. A set of guiding interview questions used to start the interview process is available in Appendix A. The interview process started with four open-ended questions. I facilitated the data collection process by asking more probing questions during the interview. Patton (1990) proposed developing an interview guide to ensure that the interviewer manages the interview time. The interview guide assisted in repeating the interview consistently and systematically (Patton, 1990).

The semistructured interview included four primary research questions for the participants to answer. The key idea behind the study was to ask the broadest questions that allow learning about the problem from the participants. The below broad questions addressed the subject under study. The questions were open; they allowed the

respondents to provide feedback on various issues related to the topic. Through these questions, I sought answers for how health care professionals address technology adoption. The questions addressed the subsections identified in the literature review.

The questions were as follows:

1. What is your experience with the human resource element, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
2. What is your experience with clinical teams' role, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
3. What is your experience with the technology funding, as it pertains to accelerating the diffusion of technology as a growth enabler, in your company?
4. What is your experience with organizational leadership and alignment, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
5. What additional information would you like to add?

#### Data Collection Technique

In qualitative research, the interview method is popular with researchers because it involves direct interaction between researchers and participants who can provide rich descriptions of their lived and contextual experiences about the phenomenon of study (Moustakas, 1994). Moustakas contended that researchers typically use long interviews to collect data in phenomenological research. An interview method is an informal, interactive process by which open-ended comments and questions researchers extract



information about lived and contextual experiences about the phenomenon of study (Schultze & Avital, 2011). Interviewing can provide the opportunity to probe the interviewee, elaborate, further discuss some topics, and to elicit responses (Peredaryenko & Krauss, 2013). The qualitative interviews formats are structured, unstructured, and semistructured (Schultze & Avital, 2011). Data collection should allow the participant to respond without any influence from researcher's assumption, bias, and experience about the phenomenon of study (Moustakas, 1994).

In this doctoral study, I used semistructured interviews to gather an in-depth understanding of the potential elements affecting developing HIT diffusion. Interviews allowed extracting information about lived and contextual experiences of participants (Moustakas, 1994). Semistructured interviews allowed answering the research questions in a purposeful way (Schultze & Avital, 2011) and examining real world complexity (Rubin & Rubin, 2012). I based my decision to use a semistructured interview format on several reasons, including the desire to obtain information from participants in a way that would allow them to respond using their own terms to express their unique personal perspectives on the questions while maintaining focus in particular topics. Participants were able to express their honest opinions about the reasons behind the slow diffusion in HIT. Semistructured interviews also allowed participants to provide examples from their experiences. I encouraged participants to describe their perceptions and experiences with the phenomenon outside the boundaries of the interview questions. Open-ended questions allowed for the capturing of common themes and ideas from the participants' worldview and experience (Moustakas, 1994).

Over a period of 1 week, I collected data from participants through semistructured, face-to-face interviews conducted at a private room at the service providers' location sites. With the consent of respondents, I used my iPhone to record the interviews and then used dictation software with speech recognition capability. I also used a smart pen to capture information during the interviews. I typed captured information using MS Word. Then I took the information from MS Word and processed it through NVivo10 software to help with pattern recognition. I allocated 20 to 40 minutes for each interview session to respect participant time. Four open-ended questions guided the interview and probed the participants' beliefs and views about obstacles delaying or preventing diffusion in service providers' SMEs. I set a meeting date, time, and location in agreement with the contact who acted as the focal point of communication. I contacted the participants by phone or e-mail to reconfirm the meeting date, time, and location. Before each scheduled interview, I sent a friendly reminder by e-mail or phone to the participant to remind him or her of the meeting date, time, and location. Moustakas (1994) noted that phenomenological interview begins with a social conversation that creates relaxed and trusting atmosphere. At the start of each interview, I dedicated time to explain the nature and scope of the study and the expectation for the interview. The consent form (Appendix B) included statements about the voluntary nature of participation, the right to withdraw at any time, and the right to refuse to answer any question that represents a risk for the participant. I provided my contact information as well as Walden's research participant advocate to all participants in case they needed to address any rights or privacy questions or concerns. I informed the participants about

the data collection procedures and the ability to withdraw at any time without any penalty. Following the explanation, participants signed the consent form (Appendix B).

#### Data Organization Techniques

I encrypted all data files related to the study including a scanned copy of signed consent forms and other approval documents. Using numbers as codes instead of names protected the participants' identities such as SME01Participant01, and SME02Participant01, etc. I also used NVivo 10 software to enter and facilitate analyzing the data, after which I analyzed trends and themes. The software use helped me in categorizing the collected data and saving time. Nevertheless, I checked data and categorization for any missed themes, categories, patterns, and relationships. The created resultant themes presented a starting point for me to structure the results from my study. Finally, I wrote a structured and easy to read and understand report that displayed an analytical review and description of the data collected. I saved data on a portable hard disk protected with a password and will keep the hard copy consent forms and the hard disk in a fire resistant safe for a minimum of 5 years to protect the rights of participants. After 5 years, I will delete all electronic versions from my computer and I will delete all files stored on the portable hard disk by using the disk utility application and a program with US Government security standards that will delete files permanently.

#### Data Analysis Technique

In qualitative research, data analysis needs creativity in analyzing and organizing it into meaningful categories (Bansal & Corley, 2011). I organized the data and prepared for data analysis after which I read the data and listened to the digital recordings to obtain

a general understanding of the information and to reflect on its overall meaning. The purpose was to extract any hidden messages from each interview. My intent was to locate the categories that represent the principal focus of each question at the beginning of the study. The categories consisted of the participants' experiences in the organizational leadership role, clinical team's role, IT, and availability of financing.

For this study, I used NVivo 10 software and the modified van Kaam method to organize and analyze the data. I used the modified van Kaam method to analyze the full transcription of each participant in search of common themes and descriptions that pertain to the research problem. The modified van Kaam method is systematic and organized. The method started by listing and preliminary grouping followed by applying reduction and elimination techniques to identify the invariant elements in the study (Moustakas, 1994). The following step involved clustering and thematizing the invariant constituents of extracted cores themes. Then I checked the themes against the other components to ensure consistency then consistently described the elements in the study for each participant. Followed is the development of a written account of each participant's experience. The last step was about constructing a textural-structural description of the meanings and essence of the research experience based on the themes and patterns generated from the study. I interpreted and reviewed to summarize the data and present it in a way that reflects the findings.

In addition to recording the interviews, I took notes to capture any key points that might need immediate capturing or analysis. I did the transcription after each interview and then translated it to English language in case of conducting the interview in Arabic. I

reviewed the transcripts more than one time to ensure the accuracy of correlation between the tape and written transcript.

I used NVivo 10 software, computer-assisted qualitative data analysis software, to support the coding and thematic analysis of the data and use it as an additional storage file. NVivo 10 software helped in systematic analysis of phenomena within textual data and supported the search for themes and codes to ascribe meanings. NVivo 10 software brought value to the study because it assisted in the analysis and enabled the rapid and accurate analysis of research items (Sinkovics & Alfoldi, 2102). NVivo 10 software allowed the coding and thematic analysis of the data and using it as an additional storage file (Sinkovics & Alfoldi, 2102). Sinkovics and Alfoldi confirmed that NVivo 10 software assists in the formalization of processes to enhance reliability of research findings. NVivo 10 software helped in systematic analysis of phenomena within textual data and supported the search for themes and codes to ascribe meanings.

I presented the results derived from the data analysis in a descriptive, story manner. The narrative integrated the entire report. I concluded the analysis by identifying learning lessons that captured the essence of the problem. I understood the tone and credibility of results by organization and analysis before moving on to more in-depth analysis.

### Reliability and Validity

Ensuring the reliability and validity of generated results is crucial. Shenton (2004) argued that *trustworthiness* is a key criterion in evaluating qualitative research. Trustworthiness refers to internal and external validity in quantitative research (Shenton,

2004). There can be no validity without reliability. Moreover, validity and reliability of a research study are interdependent (Sinkovics & Alfoldi, 2012). I took measures to ensure the validity and reliability during the collection, analysis, and interpretation of data. I was a listener, recorded, and used dictation software to transcribe accurately, was candid, and sought feedback from participants. To ensure reliability, I used the same data collection method with all participants, used the same instrument, took personal notes, and verified the interpretation of interviews questions.

Researchers use several methods for data collection, typically for the purpose to increase reliability and validity (Bluhm et al., 2011). Attaining reliability can be difficult in qualitative work, although researchers should at least strive to enable a future investigator to repeat the study (Barbour, 2010). In this study, I applied several methods to ensure the data were valid and reliable.

### Reliability

Reliability refers to replicable study findings. Throughout the project, maintaining accurate records, documentation, following consistent research processes and protocols established reliability (Moustakas, 1994). To ensure reliability, researchers use the same data collection methods with all participants in the same way (Shenton, 2004). Being the only person to interview all participants, enter, and analyze data ensured that data coding and analysis would be consistent. Using the same instrument to start each interview assisted in having a consistent approach that will improve with each additional interview (Moustakas, 1994). I ensured that the transcribed data matched the recordings by conducting three reviews. Personal notes taken at the interview assisted in verifying

and crosschecking the recordings. I asked the participants to verify the interpretation of interview questions using follow-up probing questions to confirm findings and to determine the plausibility of any results or conclusions (Shenton, 2004). I also gave the participants the opportunity to add additional input regarding the findings.

### Validity

Validity in qualitative research refers to the accuracy of findings that should reflect on the phenomenon under study (Patton, 1990). Data presented to the readers should be accurate and reliable. Although qualitative studies do not have internal and external validity, some researchers refer to *internal validity* as the ability to evaluate a particular behavior, and *external validity* as concerning with the capability to apply the study in different conditions (Shenton, 2004). However, researchers can take certain measures to offset the issue with small numbers. To establish trustworthiness, I incorporated into my study some principles identified by Shenton (2004). Shenton noted that establishing trustworthiness require a credible researcher who is familiar with the culture of participating companies. My credibility as a researcher based on background, qualifications, and experience was important because I was the principal instrument of data collection and analysis (Patton, 1990). I sought to assure participants provided honest and accurate answers through establishing trust, and by demonstrating the highest levels of care to ensure confidentiality (Shenton, 2004).

Member checking was another approach that researchers use to ensure trustworthiness. The member checking process allows the participants to review and verify the collected data (Thomas & Magilvy, 2011). I shared the interview

transcriptions with the participants to ensure accuracy. The feedback from the participants provides early interpretations or new insights as a result of reading the transcription (Carlson, 2010). To avoid any shortfalls in transcribing and member checking, I informed the participants before the interview on what to expect, in terms of the length and detail of the transcripts (Carlson, 2010). I conducted a follow-up call with the participants to ensure capturing all their feedback accurately. I also ensured that data saturation occurred through noting when new experiences and themes stopped emerging during data analysis (Guest et al., 2006). I also took *side notes* on any issues that I might observe during the interviews and then address in the analysis process.

#### Transition and Summary

In this section, I detailed the methodology applied to explore the research questions of the qualitative phenomenological study. The purpose of this study was to explore and understand what reasons stand behind delayed implementation of health information technology in the service provider SMEs. I outlined the: (a) research design, (c) role of the researcher, (d) ethical considerations, (e) population, (f) sample, (g) data collection methods, (h) collection procedures, and (i) data analysis. Then, I reflected on what measures I used to assure my study's validity and reliability.

The purpose of the third section is to gain an understanding of the elements that impact adopting HIT in-service provider SMEs. In Section 3, I start with reviewing the purpose statement. Then, I present the results and finding of the study. Section 3 includes a list the elements that influence the diffusion of HIT in Saudi Arabia. Findings and analysis portray how to drive positive change in the delivery of health care services.





### Section 3: Application to Professional Practice and Implications for Change

This section contains the results of this study. The findings reflect the participants' experiences and perceptions about the elements associated with the technology implementation process and how they inform SME leaders on strategies to accelerate the DOT. This section also contains evaluation of the results as they relate to the conceptual framework. In addition, this section includes the implications of the results from the participants' point of view. Recommendations and conclusions in this section provide insights to accelerate the implementation of technology and to enhance the decision-making process for SME leaders.

#### Overview of Study

The purpose of this qualitative phenomenological study was to explore the strategies SME medical provider leaders need to address operating inefficiencies associated with technology implementation. To interview the participants, I used four questions from the Arnaout Inquiry of Elements Contributing to Technology Diffusion (Appendix A). All participants signed a consent form (Appendix B) indicating their willingness to answer the interview questions. The interviews occurred at the SMEs' locations at a time agreed to by the participants. The study involved analyzing and transcribing the data using the modified van Kaam method and NVivo 10 software.

Face-to-face semistructured interviews were suitable to explore the participants' lived experiences and perceptions regarding human resource, clinical team, funding, leadership, and organizational alignment elements. The results were significant in

describing subjective experiences and perceptions of the elements affecting the diffusion of HIT covered in this study. In the study, I identified strategies that leaders in the Saudi Arabian medical industry may use to accelerate the HIT implementation. The findings supported the literature indicating that DOT is affected by a number of factors.

Based on data analysis of interview responses, I identified four main themes: (a) strategies to address human resources, (b) strategies to address clinical teams, (c) strategies to address funding, and (d) strategies to address organizational and leadership alignment. The strategies to address human resources were (a) pay and benefits, (b) training, and (c) staff selection and qualifications. The strategies to address clinical teams were (a) training, (b) system features and supporting infrastructure, (c) mandated implementation, (d) incentives implementation approach, and (e) assisting nurses. The strategies to address funding were (a) external enforcement and insurance, (b) funding sources and payment facilities, and (c) system value and benefits. The strategies to address organizational and leadership alignment were (a) implementation follow-up, (b) raising awareness, and (c) incentives.

#### Presentation of the Findings

In this section, I detail the findings surrounding the central research question of this study: What strategies do SME medical provider leaders need to address operating inefficiencies associated with technology implementation? The participants were SME leaders with a minimum of 3 years of experience, including medical directors, finance directors, insurance directors, IT directors, and marketing directors. Participants' names and organizations do not appear in the transcribed interviews to maintain confidentiality.

The participant code structure was based on a combination of the SME followed by a numeric code, as in SME01, SME02, and SME03, and a participant code with an assigned number, as in Part01, Part02, and Part03. For example, the first participant in the first SME was coded as SME01Part01.

I used NVivo 10 software to organize the data and applied the modified van Kaam method to analyze the data as described by Moustakas (1994). Producing the thematic codes involved coding selected blocks of text from the participants' interviews into themes, called *nodes* in NVivo 10 software (Sinkovics & Alfoldi, 2102). The theme generation occurred by clustering and prioritizing the data to find the core meanings and essence of the participants' lived experiences (Moustakas, 1994). During the interview, I repeated the answers in a different format to confirm the understanding and the meaning intended by the participant. After transcribing and analyzing the data to generate themes, I conducted a follow-up call with the participants to ensure that I had captured their feedback accurately. All 11 participants who responded agreed with the shared feedback and interpretation of their individual interview responses.

In this study I used the conceptual framework that originated from a hybrid DOI model that explained the complex issues of technology adoption, acceptance, diffusion, and infusion. The main purpose of having a hybrid-adapted model was to understand human, social, and political issues associated with the DOT in the health care field. The adapted model allowed me to address factors considered important to the DOI and not addressed in Rogers' (2003) DOI framework. Wainwright and Waring (2007) concluded that the adapted model enabled a more sophisticated understanding of the data in

organizations that are considered difficult to study due to their professional disciplines, increasing dependence on health information technology, and small business cultures.

The specific problem addressed in this research was that some SME medical provider leaders lack strategies and processes to address the issues associated with technology implementation. The elements addressed in this study were human resources, organizational leadership and alignment, clinical team role and power, and finance availability. I conducted the research by asking the participants questions about their experience with strategies and processes needed to address the human resource, clinical, funding, and leadership elements as they pertained to accelerating the DOT as a growth enabler. The interview questions aligned with the conceptual framework of this study.

The main themes from this study were (a) strategies to address human resources, (b) strategies to address clinical teams, (c) strategies to address funding, and (d) strategies to address organizational and leadership alignment. The results of the analysis of interviews included 15 strategies. Some strategies applied to more than one theme. The strategies derived from the findings were (a) training, (b) staff selection and qualifications, (c) pay and benefits, (d) incentives, (e) leadership follow-up, (f) change management, (g) insurance, (h) competition, (i) system value and benefits, (j) mandated implementation, and (k) assisting nurses.

The findings in this study revealed the following problems during HIT implementation: (a) shortage of qualified staff; (b) staff retention and Saudization, the strategy to replace expatriates with Saudis; (c) physicians' resistance to change; and (d) training. Almalki et al. (2011) found that financing, workforce, spending, changing

patterns of diseases, cooperative health insurance plans, and the use of electronic health strategies are elements that presented a challenge for the health care delivery system. However, the findings of this study revealed that funding is not a critical problem as long as the value of HIT is demonstrated. Participants' responses showed that clinical teams prefer to have the training during working hours. Through this study, I also learned how insurance companies could influence the SME leader's decision-making process and affect SME internal operations. The analysis of data collected from participants demonstrated a strong need for qualified staff, periodic training for medical and nonmedical staff, and a change-management process to support HIT implementation.

Participants' responses affirmed information gathered from the literature review regarding the DOI theory and the various elements that affect the implementation of HIT at SMEs. I related Wainwright and Waring's (2007) conceptual framework to the conclusions presented in this study through the extracted themes and findings. The findings supported the literature indicating that DOI is affected by the human resource element, clinical team role, funding, as well as the leadership and organizational alignment elements. Most of the extracted themes conform to Rogers' (2003) DOI theory and the proposed five attributes that affect the rate and likelihood of adoption. Findings indicated that at least one or more of the following five elements affect SME leaders and staff adoption of technology: (a) relative advantage, (b) compatibility, (c) trialability, (d) observability, and (e) complexity.

Emergent Theme: Strategies to Address Human Resources Element as It Pertains to Accelerating the Diffusion of Technology

Strategies to address the human resources element was the first theme. The associated strategies shared by the majority of the participants were (a) the need for training, (b) pay and benefits, and (c) staff selection and qualifications. The data collected from Question 1 informed my conclusion that staff retention and lack of qualified employees is a serious problem that is negatively impacting SMEs and delaying HIT implementation. Abouraia (2014) confirmed that Saudis receive higher salaries in comparison to expatriates, but there is a serious shortage of prepared Saudis to support the economy. The staff retention problem is driven mainly by new labor regulations, employee benefits, and competition. Hertog (2010) found that most SMEs have staff turnover, and limited access to qualified and skilled staff increases challenges of staff retention and shortage of qualifications. Participant SME01Par01 reported that more than 80% of staff who came to work had not attained more than a high school education.

Table 1 shows the strategies that emerged from data analysis regarding the human resources element as it pertains to accelerating the DOT at SMEs. Gupta and Shaw (2013) contended that combining more than one strategy would lead to better results in attracting and retaining staff. There is a need to combine more than one strategy to address the human resources element. The strategies to address human resources were (a) pay and benefits, (b) training, and (c) staff selection.

Table 1

*Frequency of Strategies to Address Human Resources Element as It Pertains to Accelerating the Diffusion of Technology*

Theme	<i>n</i>	% of occurrence
Pay and Benefits	13	15.29%
Staff Selection	17	20.00%
Training	55	64.71%

*Note.* *n*=number of responses from 20 participants

Training. Training human resources (clinical and nonclinical) was the key strategy unanimously agreed on by all participants. The theme of training was the only theme noted by all participants, and it emerged 55 times in the participants' responses. All participants agreed with Alzahrani (2011) who contended that Saudi companies suffered from a lack of trained personnel with sufficient ICT knowledge, ICT experience, and skills to manage and use the information systems efficiently. The findings also conformed to Al Merdah and Sadi's (2011) study, which indicated that the top two elements faced by SMEs were workforce skills and management capability. According to Participant SME01Part04, lack of qualified staff is a problem that could be addressed by training; however, training alone is not enough. Participant SME04Part04 noted that "Internally, the training is the most important thing, this is first of all and the second and third and the end." In order to explore the strategies of training, I searched in the participants' responses for training strategies that assisted in implementing HIT. Many participants contended that the timing, location, and method of delivery would determine



its success. Participant SME02Part01 emphasized the need to provide enough time for training, specifically for new employees.

Some participants noted that language could present a challenge for staff. One of the participants suggested providing educational material and training to override the language barrier. Other participants recommended a train-the-trainer approach in which trainers would be available to repeat training sessions as needed and respond to staff queries without delay. Many participants referred to the training location and timing as influential factors, noting that staff need dedicated time outside working hours for training. In alignment, other participants provided an opposite perspective that training should be outside working hours. Participant SME01Part02 and SME01Part04 stressed the need to have continuous training. Participant SME01Part04 added that qualified persons should provide the training and then train others through a training process. However, training alone is not enough; Boothby et al. (2010) contended that building expertise requires combining the right training with the right resources.

Pay and benefits. Participants indicated that pay and benefits play a major role in attracting qualified staff. Qureshi (2014) argued that creating jobs in the health care sector should be coupled with a salary increase to attract Saudi employees. Lim (2014) also confirmed that offering competitive salaries and benefits would make employees feel financially secure. According to Lim, pay and benefits is an effective strategy to retain staff. Employees are not committed to places that pay low salaries. Participant SME01Part01 noted that giving staff awards could not replace the value of increasing salaries. Employees leave when they find better salaries. Participant SME01Part01

explained that employees get better salaries at the MOH and it is hard to retain staff without salary increase. This finding aligns with that of Barnes, Reb, and Ang (2012) regarding the relationship between compensation and retention. As described by some participants, a problem arises when employees deserve higher pay but the owner refuses to provide it. Participant SME01Part03 noted that good pay would improve recruiting and retention of qualified staff. In contrast, both Participant SME01Part01 and Participant SME04Part04 noted that increasing pay would not always work because the increase might not always match what the competition or government is offering. This finding conforms with Idris's (2014) opinion that financial benefits are not a sustainable retention strategy. Some employees would leave for a slight increase in salary. In line with this finding, Lim (2014) argued that Saudis value intrinsic motivators most; Saudis prefer jobs that are interesting, challenging, and offer variety and career development. Participant SME04Part04 revealed that 90% of employees leave when they find a better job. Participant SME04Part04 added that SME leaders can find qualified Saudi employees who are willing to learn, but they will learn, get the experience, and then leave for another organization.

Staff selection. Responses for this theme originated from interview Question 1, which reflected on the need to select qualified staff who have basic skills in using computers. Participant SME01Part01 contended that people with an IT background and skills are better than people with no skills who need to be trained. In line with Participant SME01Part01, Participant SME02Part01 explained that there is neither time nor patience for training unqualified staff, stressing that successful places need successful people, not

people who need to be trained. Participant SME04Part03 expressed the need to mandate a minimum level of qualifications. However, work in the SMEs is not attractive because of low salaries, less attractive work conditions, lack of career paths, and lack of employment security (Hertog, 2010). As a result, most SMEs' experience staff turnover and limited access to qualified and skilled staff. Participant SME01Part03 argued that SMEs should balance between Saudization and keeping operations functioning well. According to Participant SME01Part03, SMEs employ more Saudis to meet Saudization targets. Participant SME01Part01 noted that there is difficulty across the country in finding qualified staff. Participant SME01Part03 explained that Saudi staff would learn and get the experience and then leave for another organization.

When I examined the human resource strategies through the lens of Wainwright and Waring's (2007) conceptual framework, I found that SME leaders need strategies such as pay and benefits, staffing selection and qualifications, and training to accelerate the DOT. The identified themes in this study were aligned with elements noted by Mustonen-Ollila and Lyytinen (2003). Wainwright and Waring (2007) confirmed that having a hybrid-adapted model would assist understanding human resource issues associated with the DOT in the health care field. The results show that not a single strategy is sufficient by itself. Training remains the main strategy that SMEs need to apply and enhance.

Emergent Theme: Strategies to Address Clinical Teams Element as It Pertains to Accelerating the Diffusion of Technology

Strategies to address the clinical team element is the second theme. The second open-ended semistructured question explored participants' perceptions of the clinical team role and the strategies needed to accelerate the implementation of HIT. The strategies shared by the majority of the participants were a need for (a) training, (b) incentives, (c) assisting nurses, (d) system features and supporting infrastructure, (e) mandated implementation, and (f) implementation approach (Table 2). The data collected from interview Question 2 informed my conclusion that accelerating HIT implementation, especially for clinical teams and in particular physicians, required multiple strategies such as incentives and training to support the change process. Physicians claim that they are overwhelmed with work pressure (Participant SME01Part01; Participant SME2Part04). In agreement, DesRoches et al. (2013) contended that the perceived ease of use was powerful in explaining computer use and satisfaction. Ajami and Bagheri-Tadi (2013) reported that doctors should not only have enough time during the training, but they also need to have time to develop sufficient experience with the systems. Cohn et al. (2009) referred to the need to prepare physicians before implementation because change happens with the creation of a vision for change in alignment with clinical staff empowerment. Tams et al. (2014) found that an older workforce is less likely to embrace and adopt technology in the workplace, but companies can override such challenges through encouraging frequent teamwork. Participant SME04Part01 contended that working with doctors and nurses is more difficult in comparison to other staff. Participant SME02Part04 referred to the old generation of physicians who always reject anything related to technology.

Table 2

*Frequency of Strategies to Address Clinical Teams Element as It Pertains to Accelerating the Diffusion of Technology*

Theme	<i>n</i>	% of occurrence
Assisting Nurses	10	12.50%
Implementation Approach	6	7.50%
Incentives	23	28.75%
Mandated Implementation	6	7.50%
System Features and Supporting Infrastructure	22	27.50%
Training	13	16.25%

*Note.* *n*=number of responses from 20 participants

Although HIT brings benefits, many clinicians resist it because they view it as a time and money waster (Participant SME02Part04). SME05Part02 stated that “Some people are enemies of change.” Cohn et al. (2009) reported that around 50% of HIT efforts fail because of poor planning, miscommunication, mismanagement, overspending, and rejection by users. Aligned with Cohn et al., Participant SME01Part01 confirmed that when doctors refuse to learn, they create problems for the SME. Bah et al. (2011) identified the reluctance of doctors to use the EHR as a barrier. It is important to be patient with the clinical team, give them more time, and show them the system value (Participant SME02Part04; Participant SME04Part01). Clinicians should see value in implementing HIT, both to themselves and the patient (Participant SME01Part03).

Assisted nurses. The participants' perceptions indicated that SMEs could apply various strategies to address the clinical team's challenges and meet their needs. Clinical teams, especially physicians working at SMEs, are under pressure as stated by Participant SME01Part01. Johnson and DuSold (2013) reported that nurses play a critical strategic role in accelerating HIT implementation. In line with Johnson and DuSold's (2013) findings, Participant SME05Par04 suggested providing human support by technicians or nurses to assist the doctors in completing system work technicians. Participant SME03Par03 explained that SMEs rely on nurses to operate the system and support elderly doctors. Participant SME04Part02 supported Participant SME03Par03 regarding assisting nurses should support doctors who are not accepting the system. Participant SME03Par03 and Participant SME01Par01 argued that doctors should focus on clinical practice. According to Participant SME03Part01, a nurse's role to assist in IT implementation comes over and above their duties as a nurse. Participant SME03Part03 justified the need for nurses because they know how to use computers and their English language better than some doctors. Rojas and Seckman (2014) stressed the vital role of nurses because they have a deeper understanding of clinical workflow. Johnson and DuSold (2013) also contended that nurses contribute to HIT training and to the ongoing support of physicians. In agreement, participant SME05Par04 added that nurses are aware of doctors' work, and they can assist in data entry. Rojas and Seckman (2014) added that nurses should not only assist but also participate in HIT evaluation. Participant SME03Part03's conclusion was that HIT implementation success is associated with having well experienced nurses.

Training. Continuous training sessions and meetings with clinical teams support the HIT implementation and accelerate adoption (Participant SME02Part04). Participant SME02Part04 noted that clinicians, especially the old generation, need more time for training. This finding is in line with Ajami and Bagheri-Tadi (2013) who contended that doctors did not always find time to use the system fully and to participate in comprehensive training. Participant SME04Part01 noted that training should be done at a time that is convenient for the clinical team without adding more pressure to their usual daily tasks. Most participants supported providing the training during working hours, but some owners do not like this approach (Participant SME04Part01; Participant SME05Part02). SME05Part02 confirmed that SME owners prefer that training take place outside the working hours. Participants indicated that enough time should be given to training clinicians, keeping in mind the need to repeat the training sessions periodically (Participant SME03Par04; Participant SME04Par01). Ajami and Bagheri-Tadi (2013) reported that doctors should not only have enough time during the training, but they also need to have time to develop sufficient experience with the systems.

Participant SME02Part04 explained that the new generation of physicians was more receptive to new technology. In the same direction, Participant SME04Part04 argued that some older physicians cannot use computers and that makes their training with the system harder. Hood (2011) contended that the clinical and administrative staff competencies determine the success of technology implementation. Ajami and Bagheri-Tadi (2013) noted that doctors need good typing skills to enter patient medical information, notes, and prescriptions into the EMRs. Johnson and DuSold (2013) argued

that nurses could support the training process and the doctors to enter data. Participant SME04Part01 contended that training clinical teams on using computers is a prerequisite to implementing HIT. McAlearney, Robbins, Kowalczyk, Chisolm, and Song (2012) found that training programs reflecting previous IT implementation experiences, contribute to better learning outcomes. Participant SME04Part01 noted that physicians should have intensive specialized training.

System features and supporting infrastructure. Lim (2014) added that SMEs should provide supportive work environments and conditions. Rojas and Seckman (2014) argued that systems should not hinder clinicians; it should be understandable and usable. In agreement, DesRoches et al. (2013) contended that the perceived ease of use was powerful in explaining computer use and satisfaction. Participant SME01Part04 stressed that systems should be easy and not complex. Other participants stressed the need to simplify the work of the clinical team (Participant SME04Par04; SME02Part04). The finding was aligned with Rogers (2003); DOI theory attributes that affect the rate and likelihood of adoption. Participant SME04Part02 noted that systems should enhance employees experience and teach them new ways of doing things. The system should be simple integrated system that covers all the needs of the organization (Participant SME03Part03). Participant SME05Part04 noted that the system should have the capability for departments such as clinics, laboratory, billing, and insurance. It is crucial that the system respond to insurance companies' requests (Participant SME01Part02; Participant SME01Part03; Participant SME05Part04).



All participants agreed that physicians need some sort of additional support. Participant SME04Part02 explained that doctors need tools to assist them in implementing HIT. Participant SME03Par03 supported SME04Part02 and explained that systems need machines that are advanced and integrated to start working. Providing clinical teams with new computers will encourage them to work more on the system (Participant SME03Part03).

Incentives. Providing incentives and system features showed the greatest frequency among clinical team's strategies (see Table 2). Participant SME05Part01 stated that providing incentives, moral or monetary, support the system implementation. Ajami and Bagheri-Tadi (2013) contended that financial rewards for quality improvement increase EMRs implementation. In agreement, Participant SME05Part01 explained that incentives could increase clinicians' commitment to implement HIT. Clinicians would work hard in return for motivation and incentive (Participant SME05Part01). Participant SME02Part04, SME04Part02, and SME04Part02 agreed that giving incentives would help in the implementation process. Participant SME04Part02 argued that system benefits represent an incentive for doctors because HIT assists them in evaluating their work, enhancing their work, and increasing their income. This finding conforms to Devaraj et al. (2013) that HIT proved that it could affect the scope of clinicians practice. Participant SME03Part03 suggested another form of incentive in the form of creating competition among the employees. The competition would incentivize the employees to outperform others (Participant SME01Part02; Participant SME01Part04).

In contrast, some participants articulated the importance of showing the benefits of the system, but they did not fully agree that giving incentives would help (Participant SME01Part01; Participant SME05Part02). The participants argued that giving incentives would help in certain instances, but giving incentives is not the only strategy to accelerate the implementation of technology (Participant SME01Part01; Participant SME05Part02; Participant SME02Part01). Participant SME02Part01 noted that the business need should be enough. Participant SME01Part01 confirmed that they tried using some techniques like awarding performing employees, but it did not help much because the problem is in the low salaries paid by SMEs. Participant SME05Part02 agreed with Participant SME01Part01 explaining that some staff rejected incentives that brought with it more work; there is a need for stronger incentives. Participant SME05Part02 suggested that punishment should be the last strategy if incentives did not work.

Mandated implementation. Some participants believe that mandating the training and implementation is the alternative for reward and punishment strategy (Participant SME05Part02). Mandating the training on HIT could help in HIT implementation and in increasing personal benefits (Participant SME01Part02). Participant SME01Part02 contended that with mandating the training, no one will learn. The same participant extended on the need to put constraints for licensing (Participant SME01Part02). HIT training should become a prerequisite for achieving certain certifications that allow clinicians to work (Participant SME01Part02). SME02Part01 supported the mandatory approach because the need to adopt HIT is universal.

Implementation approach. Participant SME04Part01 explained that implementation should be in stages. Participant SME04Part04 stated that the training should be the first step. It is important to train staff and doctors to ensure they know how to deal with the system (Participant SME04Part04). This finding is aligned with Cohn et al. (2009) noting that companies should pay attention to the details before the implementation, including selecting the HIT systems, preparing physicians, and the planning the go-live date and beyond. Participant SME02Part04 contended that implementation should start gradually in groups. Time should be given to test the implementation of each stage (Participant SME05Part03). Participant SME02Part04 noted that SMEs should not pressure clinical teams in the implementation. Participant SME05Part03 agreed with the other participants that implementation should start with a small part of the existing work on the new system. It is very important to test the new systems for problems (Participant SME05Part03). The vendor should be available during this testing period to address any problems and solve them quickly (Participant SME05Part03). Participant SME04Part01 argued that implementing in stages would allow the doctors to see the value of the system, and how it can save time and effort. Participant SME05Part02 suggested starting with the supporting team members who believe in the system value.

The adapted DOI framework of Wainwright and Waring (2007) allowed for the exploration of professional cultures such as clinical teams. It also allowed for exploring political contexts within the health care SMEs. The findings supported the literature indicating that DOT is affected by the clinical team role. Hood (2011) contended that the

clinical team skill set and competencies are needed for successful implementations. The identified strategies conform to Wainwright's and Waring's (2007) conceptual framework. In the study, I found that clinical team members could resist the implementation conforming to Cohn et al. (2009) who reported that around 50% of HIT efforts fail because mismanagement and rejection by users. The need for easy to use systems conforms to Rogers (2003) DOI theory about the system ease of use and how it is perceived. Rogers (2003) argued that compatible and consistent systems with the existing values and needs of potential adopters accelerate the implementation process. The finding of mandating the implementation also aligned with another DOI attribute, management hierarchy, stating the need to enforce adoption (Wainwright & Waring, 2007).

Emergent Theme: Strategies to Address Technology Funding Element as It Pertains to Accelerating the Diffusion of Technology

Strategies to address the funding element is the third theme. The common strategies shared by the majority of the participants were system value and benefits, external enforcement and insurance, and funding sources and payment facilities (Table 3). The data collected from interview Question 3 informed my conclusion that funding is not a critical problem to SMEs because information systems are relatively affordable, and the return on investment is visible. Almost all participants noted that the software price is not their main concern. Demonstrating system value facilitates getting funds from owners who are mainly concerned about making profits. SMEs need financial planning to align with ICT initiatives that assist in achieving set financial targets. Cohn et al.

(2009) reported that around 40% of physicians believe that inadequate financial resources are an impediment to implementation. In alignment with Cohn et al., Participant SME02Part02 reported that some SMEs have difficulty in paying salaries, and without sources of funding, they would not be able to develop themselves. However, the majority of the participants contended that information systems needed by SMEs are not expensive (Participant SME02Part01; Participant SME04Part03; Participant SME04Part04). SMEs needed software is not expensive, and its value is not an obstacle that requires a source of funding (Participant SME02Part01; SME05Part04). SME01Part01 noted that SMEs generate considerable profits that should not be underestimated.

Owners want to achieve profits through reducing expenses. On the other hand, participants were interested in the efficacy of the software, not the price (Participant SME02Part01; Participant SME05Part03). In his DOI theory, Rogers (2003) referred to the relative advantage where innovation should introduce improvements. In alignment with this finding, SME05Part03 stressed the need for software that, when implemented, improves the patient flow. The majority of the participants believed that external factors represented in competition, and insurance companies are major drivers of HIT implementation. Some of the participants confirmed that such factors are mandating the owners to invest in HIT (Participant SME01Part02; Participant SME01Part01). When asked about the owners' main incentive to push for technology implementation, SME02Part01 stated that it is the value for the center.

Table 3

*Frequency of Strategies to Address Funding Element as It Pertains to Accelerating the Diffusion of Technology*

Theme	<i>n</i>	% of occurrence
External Enforcement and Insurance	16	41.03%
Funding Sources and Payment Facilities	11	28.21%
System Value and Benefits	12	30.77%

*Note.* *n*=number of responses from 20 participants

External enforcement and insurance. The decision-making process resides with the SME owners. Most participants confirmed that external factors catalyzed the owners to invest in HIT implementation. Participant SME01Part01 confirmed that SMEs would invest when they feel *cornered*. SMEs should consider external elements that would impact the implementation such as insurance companies, competition, and regulations (Participant SME02Part01). Participant SME01Part01 argued that without some pressure from the insurance companies, the owners would have never invested. Participant SME01Part02 explained why insurance companies affect technology funding. The participant argued that technology facilitates the work of insurance companies that would give preference for SMEs having the technology (Participant SME01Part02). This presents an incentive for SMEs to invest money in HIT that will enhance the SME productivity and eventually their business with insurance companies (Participant SME01Part02). Participant SME01Part03 agreed with Participant SME01Part02 and noted that SMEs should adjust their software to be compatible with insurance companies' e-billing. In agreement, Participant SME01Part01 provided an example of some

insurance companies mandating the use of an electronic portal where the owner had no choice but to pay for this service. Insurance companies expect SMEs to control their fees and reduce claims' costs (Participant SME01Part02). If insurance companies delay payments, owners will rush to implement HIT; owners will not invest their own money (Participant SME01Part01). Participant SME02Part01 and Participant SME01Part02 added that if another competitor offers the insurance company lower prices and claim losses, the insurance company would divert their patients to the other center.

Competition on business catalyzes owners to invest in their centers development (Participant SME01Part02; Participant SME01Part03). If competition implements advanced technology, others would not want to *be left behind* in a disadvantaged position (Participant SME02Part01). Ami-Narh and Williams (2012) argued that health care companies in the developed nations make investments in eHealth in order to achieve competitive advantage. In agreement with Ami-Narh and Williams, participant SME01Part02 stated that competition drives owners to invest money in HIT, especially to preserve their advantage with insurance companies.

Participant SME04Part04 noted that making the implementation mandatory would accelerate its adoption and increase investment. Supporting regulations would stimulate the owners to fund HIT projects (Participant SME01Part02; Participant SME01Part01; Participant SME04Part04). Participant SME04Part03 contended that implementing HIT should be mandatory for the owners to pay. The participant suggested mandating certain systems that could be evaluated and certified by governmental institutions such as CCHI (Participant SME04Part03). The participant supported his argument because many SMEs

buy substandard software applications because they are not expensive (Participant SME04Part03). Participant SME02Part03 stated that SMEs should offer unique services to be competitive when compared to clinics around the same location. In contrast, Participant SME01Part04 agreed with SME04Part03 noting that irrespective of the quality of services offered by the SMEs, there should be regulations to enforce HIT implementation.

*System value and benefits.* The decision-making process resides with the SME owners. Most participants agreed that owners should see the value and the benefits of the system to stimulate investment. Bardhan and Thouin (2013) contended that health information technology is linked to productivity and has the potential to impact quality of services and to lower operational expenses. Most owners are commercially driven. Cappellaro et al. (2011) noted that financial constraints had a greater impact on private companies seeking profit. SME04Part02 explained that SME owners want any new system to generate more profits than the old system. The main concern for owners is profit and not employees (Participant SME04Part02). Owners will not invest in systems that only improve work process; the system should ensure more profits (Participant SME01Part02). Participant SME01Part02 supported this idea by stating that owners want the least losses possible, and owners will support the technology if it supports reducing losses. This finding aligns with Zhu et al., (2012), who contended that the cost of investment is a barrier. SMEs want to see the value and benefit to invest irrespective of the software price (Participant SME01Part03). Adler-Milstein and Bates (2010) argued that companies could glean several benefits from implementing HIT like



improving quality of care and reducing cost. SME01Part03 stated that amount of funding was directly related to the value created by the technology. Some participants supported the notion that if value is shown, technology funding should not be an issue (Participant SME01Part03 and SME02Part1). In contrast, other participants believed that even if the owners see value in implementing HIT, they still do not invest (Participant SME01Part01; Participant SME01Part01). Some companies believe that eHealth shows a positive return on investment (ROI), but they find difficulty in reflecting that to stakeholders (Khurshid et al., 2012). In support of the latter finding, Participant SME01Part01 argued that the main problem is about assessing the value of HIT implementation and who will study it. Participant SME02Part03 also stated that owners would look at HIT feasibility study, including pros, cons, and market needs to decide on the investment. However, not all will invest; SME01Part01 supported SME02Part03 stating that some would see the value and invest, but other owners might ask that while work is continuing and profitable, why invest?

Funding sources and payment facilities. The findings revealed that more supporting factors and incentives should exist to support the HIT implementation. The participants' referred to payment facilities and external funding resources as additional factors that would ensure and accelerate the implementation of HIT. Most participants confirmed that paying the cost of the system in installments would support the buying process. SME05Part01 stated confirmed that most SMEs are attracted by installments and most businessmen follow that approach. External funding resources included mainly banks (Participant SME04Part03, SME02Part04, & SME05Part01). However,

Participant SME05Part01 informed that until now, banks were not fully supporting. In contrast, Participant SME01Par03 stated that SMEs self-fund HIT and its funding should be a percentage of the center revenues.

The funding-related strategies conform to Rogers (2003) DOI theory, and the proposed five attributes that affect the rate and likelihood of adoption. The reader could associate Wainwright and Waring's (2007) conceptual framework to the conclusions presented in this study through the identified themes and strategies. Rogers (2003) identified relative advantage as a factor that contributes to the diffusion of innovation. In alignment, the study results reflect the need for the owners to see the value of the systems to invest. In addition, the SME management as opinion leaders and change agents, need to influence the owner decision to invest mainly by showing the value (Wainwright & Waring, 2007). The findings supported the literature indicating that attributes such as price and external factors affect funding decisions (Wainwright & Waring, 2007).

Emergent Theme: Strategies to Address Organizational and Leadership Alignment Element as It Pertains to Accelerating the Diffusion of Technology

Strategies addressing the organizational and leadership alignment element is the fourth theme. The common strategies shared by the majority of the participants were raising awareness, implementation follow-up, and incentivize (Table 4). The data collected from interview Question 4 informed my conclusion that the top priority for leadership is to communicate the HIT value to staff, and follow-up on the implementation to eliminate any obstacles, and provide the right environment. Chong et al. (2011) stressed the leadership role in educating and communicating with employees to ensure

they have knowledge of the business-IT strategies. In alignment with the findings, Participant SME04Part02 stated that leaders should ensure systems' alignment with staff needs. Leaders need to study the readiness of staff with the new technology.

CEOs should associate technology to organizational success and sound financial results (Hood, 2011). Participant SME01Part02 supported the concept noting that SMEs depend on profits, and all staff should be aligned to anything that leads to profit. Leadership should also align and provide all needed support as stated by Participant SME05Part04. Valorinta (2011) asserted that a successful alignment of IT-Business strategies results from the effective collaboration between CIO and CEO in IT planning processes.

Without authority, leadership will not be able to execute any of the above mentioned strategies (Participant SME04Part01). In one particular case, Participant SME01Part01 confirmed that in more than 80% of SMEs, leaders such as the medical director or administrator could not do anything without going back to the owner. The main decision maker is the owner (SME02Part01). The innovation-decision process involves various steps that start with the individual receiving first knowledge of innovation followed by having a position that supports taking decision to adopt or reject to implementation new innovations (Rogers, 2003).

The role of insurance companies had a direct impact on all other elements. This element was capturing the full attention of all participants. Participants referred to insurance companies in all elements that affect the DOT. They look for insurance companies to provide support for training, funding, and organizing the efforts to

implement HIT.

Table 4

*Frequency of Strategies to Address Organizational and Leadership Alignment Element as It Pertains to Accelerating the Diffusion of Technology*

Theme	<i>n</i>	% of occurrence
Implementation Follow-up	15	45.45%
Incentivize	10	30.30%
Raising Awareness	8	24.24%

*Note.* *n*=number of responses from 20 participants

Implementation follow-up. The findings revealed that the leadership role of follow-up on implementation is the most important as seen in Table 4. Technology implementation needs the direct attention and ownership of leadership (Hood, 2011). Participant SME05Part01 argued that if leadership does not assume the role to monitor and follow-up on HIT implementation, employees, and clinical teams would not implement the system. Leaders should follow-up to ensure that the system is working properly (Participant SME05Part01; Participant SME04Part01). Participant SME05Part01 added that leaders could identify the advantages and disadvantages of the system. When asked about the leadership need to follow-up on implementation, Participant SME04Part01 supported Participant SME05Part01 stating that if problems happen in the implementation or non-compliance, leaders should have solutions and authority to solve problems or solve problems faster.

Raising awareness. Hood (2011) ascertained that the top management should keep staff aware of the impact of technology implementation and communicate to them, through developing and sharing implementation roadmaps. Other researchers (Iyer & Israel, 2012; James, 2012) confirmed that communication with staff would increase staff retention. Participant SME05Part01 added that leaders could identify the system advantages and disadvantages to guide vendors to improve and develop systems. Participant SME01Part03 noted that leadership should raise the owners' awareness about the benefits of HIT by using statistics demonstrating the benefits of implementing specific technologies. The participant argued that leaders need to show them the benefits of the system. It is leadership's responsibility to gather statistics and compare results before and after implementation (Participant SME01Part03). Owners need to see the statistics and how much benefit they would accrue from implementing the technology (Participant SME05Part01).

Participant SME01Part04 explained that when leaders or decision makers have a background of the system and its value, this would help them in implementation and pushing the staff to implement. In agreement, Participant SME03Part03 contended that management having experience with HIT could direct staff to implement HIT faster. Participant SME04Part01 stressed that implementation would not be complete without the leadership follow-up and participation in the training. Participant SME04Part02 shared that leaders should study the readiness of staff to implement new technology. Participant SME02Part03 confirmed that SME leaders have a role to convince and

change owners' perceptions about HIT. As noted by Participant SME05Part04, some owners lack the experience.

Incentives. Lim (2014) contended that providing rewards and competitive salaries is an effective strategy to recruit and retain staff. In agreement, Participant SME01Part02 explained that having incentives is needed to push human resources to learn. In contrast, Participant SME02Part02 stressed that putting pressure on others to improve work is fine but pressure focused only on increasing revenue is not acceptable. Participant SME02Part04 contended that staff receiving incentives and salary increases remained longer with the SME. Participant SME03Part03 suggested giving promotions from time to time for staff working on the system. Promoting staff would encourage other staff to do their best to work on the system (Participant SME03Part03). Participant SME03Part03 added that leaders' commitment to promises encouraged staff to work on the system.

It is healthy to create challenges among the employees; the challenge to show who can perform better through working on the system (Participant SME03Part03). Each employee wants to be better than others, and this drives them to develop their skills (Participant SME03Part03). Participant SME04Part02 added that contract renewals should be linked to technology implementation. Participant SME04Part05 explained that leaders could incentivize staff support through awards, overtime, and sharing a percentage of revenue per patient.

Building on the conceptual framework of Wainwright and Waring (2007), the research findings of the fourth theme indicated that staff rely on their leaders and peers to

share experiences and guide them through the implementation process. As shown from the analysis, the findings lend support to the argument that leadership follow-up and engagement could accelerate the HIT implementation. The strategy to offer different types of incentives and showing the value of the system conforms to Rogers (2003) DOI theory and the attribute of relative advantage.

#### Applications to Professional Practice

The findings of the study reflect potentially important applications in professional practice that apply directly to SMEs and indirectly to other health care providers in Saudi Arabia. SMEs can leverage ICT to reduce expenses, increase productivity, increase efficiency, and increase the rate of innovation (Al-Maliki, 2013). The application to business from the findings of this study revealed two significant insights. The first insight was the significant role of insurance companies in influencing and shaping SME operations generally and HIT implementation specifically. Business success is not only dependent on internal operations excellence, but also in addressing and responding to external factors and influencers. Boothby et al. (2010) suggested that investing in more technology should align and integrate with organizational operations. This direction should be aligned with the strategic partnerships that should exist between insurance companies and SMEs. One attribute of DOI is *observability*; innovation results should be visible to others (Rogers, 2003). SMEs owners, leaders, and managers contended that they observed business improvement and encouragement with the implemented HIT. Other SMEs should leverage business improvement results that can stimulate their awareness and encourages them to adopt HIT. Based on this business realization, SME

leaders could use the study findings and conclusions for a practical plan to communicate with insurance companies who could offer their assistance and support.

The second insight that emerged from the analysis of the data was that some regulations that are beyond the SME capability to change could work against their interest and affect their business negatively. Abouraia (2014) reported that government officials want to oblige organizations to utilize no less than 75% Saudis. Yusuf (2014) argued that the government policy of Saudization that privileges nationals in the labor market is creating an adverse effect. SMEs could find ways to reverse the negative impact of the new regulation that requires employing only Saudis to work as receptionists. Abouraia contended that current employment opportunities are not appealing to Saudis because such occupations do not fulfill their desires of pay and work conditions and they still depend on government occupations. Abouraia added that the Saudi government officials are endorsing Saudization to reduce heavy reliance on foreign workers. Ramady (2013) reported that the government is promoting a new policy that Saudis be employed on merit, education, skill, and productivity. Qureshi (2014) suggested that awareness about the Saudi human resources needs should start at schools and universities. Al-Qahtani, Almansour, Alharbi, Aljasser, and Alsunaid (2013) added that employers want employees to seek continuous education.

SMEs can cooperate with insurance companies and other government agencies to develop special programs that will address the staff retention challenge. SMEs may also utilize the study's identifying the need to open a dialogue between SMEs and insurance companies with the goal to build market coalitions that can play an effective pivotal role



in setting new market trends. The cooperation would also extend to informing future efforts to introduce new regulations that can benefit the health care industry. This implication conforms to Hertog (2010) who noted the need to tailor policies to fit the challenges arising from the population demographics in Saudi Arabia. Such policies could create an enabling environment that supports developing SMEs and facilitates services. SMEs can build on the study's findings to transform their mindset, especially the owners, from being reactive to market pressures to proactive. This would enable building stronger relationships with their clients and position SMEs as highly competitive in the market.

Despite the various challenges noted in the study, SMEs are well positioned to accelerate their HIT implementation as a result of many factors, mainly; the business need to improve performance, increase profitability, and address pressure from insurance companies. Lewis et al. (2012) contended that HIT offers an opportunity to increase efficiency, reduce administrative costs, facilitate communication, and improve patient care. Bahaddad et al. (2013) argued that SMEs are unaware that information technology improves business operations. I challenged the argument of Bahaddad et al. because my findings revealed that SMEs are aware of the value of information technology, but they need specific strategies to make it happen. Another disagreement was with Hertog (2010) who contended that financing is a key challenge for SMEs worldwide, but it is stifling in emerging markets. This was not the case based on my findings; most SMEs did not see financing as an issue, especially with the affordable software prices.

Findings from this study confirmed the key and vital role of training for clinical and non-clinical staff in accelerating the implementation of HIT. Al-Maliki (2013) stressed the need for adequate numbers of skilled personnel. McAlearney et al., (2012) contended that training should incorporate active learning, use role models, and address the different training needs of different employee groups. The study findings may enable SME leaders to determine how they can implement effective training programs that gain greater acceptance. Jehanzeb, Rasheed, and Rasheed (2013) stressed the central role of leaders in supporting employees' training involvement in Saudi Arabia. The training program would support skills building and contribute to solving the staff retention issue.

Study findings suggested the need for introducing a change management program to support the clinical teams. The change management program would help leaders in creating shared needs and aligning people for change. SME leaders may benefit from a change management program by providing a smoother transition from the current state to a future state. Jehanzeb et al. (2013) argued that organizations should consider how to get their employees to recognize and support organizational goals, missions and values through appropriate training. SME leaders may also benefit from the change program, as they may agree to change their own actions and behaviors to demonstrate their commitment to the change.

#### Implications for Social Change

The implication for social change of this research was to improve the health care delivery system that contributes to improving the social conditions of people living and working in Saudi Arabia. Health care delivery systems should continue to change to

meet the changing needs of societies (Bahaddad et al., 2013; Fayn & Vuillerme, 2013). The results of this study may provide SME leaders' directions on the needed actions that will help them accelerate the implementation of HIT that will assist them to be efficient, competitive, and meet the changing needs of society. The study findings might promote positive social change by increasing the knowledge of service provider SMEs, payers, and regulators on the main elements that contribute to slow diffusion of HIT. The findings were significant because they revealed the theme of insurance companies that play a major role in the success and survival of SMEs. The improved access to information may empower health professionals and patients to make informed decisions they will lead to quality, access, and cost improvements (Al-Shorbaji, 2013).

Findings from this study may contribute to management literature to eliminate the hurdles that may impede the implementation of HIT. The findings may contribute to positive social change, as SMEs could apply these solutions to improve HIT adoption by clinical teams. Bardhan and Thouin (2013) contended that health information technology is linked to productivity and has the potential to impact quality of services and to lower operational expenses. The findings may encourage SME owners to invest in change management programs that can meet the professional needs as well as improving patient care. The findings would build more confidence to set up training programs for health professionals and to communicate the benefits and impact of HIT to working teams. The study might provide a lead on how SMEs can work cooperatively to tackle staff retention challenge that is creating unstable working conditions.

Medical SMEs play a role in creating a reliable, sustainable health care delivery

system in Saudi Arabia. The improvement in health care delivery system would lead to positive social impact (Fayn & Vuillerme, 2013). When the SMEs function well, each SME will contribute to the economic growth and eventually an agent of social change in Saudi Arabia.

#### Recommendations for Action

The objective of this qualitative study was to understand and explore what strategies SME medical provider leaders need to address operating inefficiencies associated with technology implementation. This study's scope included a conceptual framework that originated from a hybrid DOI model that explained the complex issues of technology adoption, acceptance, diffusion, and infusion. The main purpose of having a hybrid-adapted model was to understand human, social, and political issues associated with the DOT in the health care field. The main elements addressed in this study were human resources, organizational leadership and alignment, clinical team role and power, and finance availability.

Based on the results of this study and in relation to the human resources element, I recommend that SME leaders exert more effort to start or accelerate the implementation of technology to respond to the challenges of competition, new regulations, insurance companies demand, and the need for better care. Al-Maliki (2013) contended that investing in ICT contributes to the economic growth. Leaders could streamline efforts in the right direction to achieve desirable business results. Lim (2014) contended that leaders could provide supportive work environments and conditions. SMEs should take an initiative to cooperate and think collectively about solutions that will serve both their

organizations and the Saudi workforce. Thinking creatively can assist the leaders in identifying solutions. Although employees' pay and benefits are affected by market conditions, leaders could work on reviewing staff packages based on individual performance as well as the overall business performance. As a key component of HIT implementation, leaders should continue their effort to train their clinical and non-clinical staff. The SME leaders need to consider the staff needs to ensure effective delivery or training. They could provide the right environment, amount, and frequency of training, enabling tools, trainers, and training schedules. Al-Asfour and Khan (2014) contended that retaining staff requires a framework for employees' development that aligns with the demands of the job market. It will also help if leaders reconsider their strategies and hire the right people for the right job.

Leaders should open dialogues with insurance companies on aligning performance objectives that will bring benefits for both parties. SMEs may seek the assistance of insurance companies in increasing awareness about HIT and its vital role in enhancing the relationship between the SMEs and insurance companies. Cooperation among multiple SME leaders could bring value and constructive strength to the discussion table. Leaders could implement change management programs along the process of HIT implementation. Identifying change agents within the organization can serve and accelerate HIT implementation. Leaders could ensure that shared needs are created and sustained by staff.

Leaders should continue to leverage the affordable software price and ask for more system enhancements that will serve their organization during medium to long-term

timeframes. Payment facilities, offered by most vendors, offer an opportunity to buy more services, including system maintenance and training. As suggested by Al-Maliki (2013), government officials need to continue their support the private sectors and leaders should leverage this support to increase the use of ICT in order to raise levels of efficiency. Leaders need to maintain their continuous monitoring role in HIT implementations. They need to be the first to learn, adopt, guide, and coach other staff. Being the role model, with authority, could catalyze all staff to be serious and committed to the implementation. Leaders should seek systems that serve the patient, staff, and business needs. Leaders must avoid investing in sub-standard cheap software. The costs of replacing such systems and re-training staff can be significant. Leaders need to review their monetary and moral incentives to ensure that they meet the current needs of staff. Health care market conditions in the Saudi market are changing; leaders need to monitor closely such conditions and calibrate their internal incentives as needed.

The findings from this study may be of interest to health care industry leaders, specifically SME leaders. Applying the findings may help leaders grow their business and enhance their performance. Furthermore, findings and recommendations from this study could be of interest to all stakeholders involved in the health care delivery such as insurance companies, professional associations, and system vendors. In addition, this study's findings may be of interest to decision makers in the Ministry of Health, Ministry of Labor, and the Council for Cooperative Health Insurance. To disseminate the information learned in this research and to contribute to academic literature and management practice, I will share the executive summary of the results with my study's

participants. The findings could benefit audiences at conferences and seminars of professional organizations such as: (a) Saudi Association for Health Informatics, (b) Healthcare Information and Management Systems Society, (c) Saudi Health Information Management Association, (d) International Medical Informatics Association, (e) Saudi Central Board for Accreditation of Healthcare Institutions, and (f) Council for Cooperative Health insurance. Finally, the results of this study will be in circulation through publishing with ProQuest.

#### Recommendations for Further Research

Findings from this study could pave the way for conducting further research regarding the medical provider SMEs in Saudi Arabia. Considering the significant role of insurance companies, I recommend further study on strategies to attract insurance companies to support SMEs. I also recommend conducting a study to explore the strategies SME leaders are using to address the staff retention challenge. In this study, I explored four strategies that SMEs are employing to address the diffusion of information technology. However, future researchers could examine the impact and influence of other elements such as regulations. Other researchers could repeat the same study but for larger medical providers considering the insurance and staff retention factors. Based on the research in this study, I recommend a study to examine the adverse effects of new regulations on SMEs medical providers. Regulators and MEs could both benefit by understanding how such new regulations may be perceived.

SMEs that participated in the study were located in Riyadh city, the capital of Saudi Arabia. The identified themes in this study may be applicable to different cities

because many of the challenges rose such as staff retention, Saudization, lack of qualified staff, and insurance may be local market problems. However, further study in another city could validate this assumption. As noted by Almalki et al., (2011) Saudi participants' numbers were low in comparison to other nationalities. A future study that targets only Saudis could explore and identify different experiences and expectations.

Fourteen participants gave their feedback in Arabic and my ability to translate their responses into English was a challenge. Future researchers could prepare two versions of the interview questions and collect data completely in Arabic. This could require more effort as it would require collecting data in two languages based on participant preference.

This study was a qualitative phenomenological qualitative design that enabled me to understand the phenomenon under study through the lived experiences of my study's participants. Other researchers could use a quantitative study to generate objective results that can confirm, expand, or refute the findings of this study. Quantitative research allows the generalizing of individual's experiences to a larger population (Thomas & Magilvy, 2011). The quantitative study's population sample could cover larger, medium, and small medical providers.

### Reflections

What attracted me to pursue a DBA degree rather than a PhD was the focus on studying a business problem. Coming from the business world with 20 years of experience, I appreciated the DBA program approach as it related to me more as a professional. My selection of the topic was based on professional and personal interest.



It meant a lot for me to conduct the study in a country and industry I had worked in for about 13 years. Completing my study and sharing its results may contribute to the market growth was one of my objectives. In a way, I wanted to pay back to the country that I lived and worked in for 13 years. I also wanted to contribute to the growth and improvement of an industry that I believe is crucial to our existence as human beings.

I was blessed with the support I received to identify the potential participants. However, conducting the interviews became a challenge, as I needed to schedule my time between my work and travel for conducting the interviews. Conducting a study in a different country from where a researcher resides can be cumbersome. Scheduling and conducting interviews was an issue due to unforeseen conditions; a sand storm delayed flights and left me stranded at the airport for 14 hours. I was lucky to be on the first flight after resuming flights. The timeframe to recruit and conduct the interviews took around 3 months. Conducting a qualitative study shaped my thinking on how to be a knowledgeable and experienced qualitative researcher. However, I would like to utilize the quantitative method in my next research project.

The literature review and my professional exposure to health care and HIT specifically in the Saudi market, prepared me well for conducting the interviews and comprehending the participant experiences, and in developing and interpreting the results of my study. To mitigate potential bias, adhering to the interview protocol and avoiding any deviation from the research questions, helped assure my personal objectivity. What I did not expect was that most participants were Arabs; many requested to respond in Arabic irrespective of their ability to speak the English Language. I did not expect that

financing would *not* be an obstacle for implementing HIT. The awareness of the participants about value and benefits of HIT exceeded my expectations. The feedback from the participants reflected passion and concern about the health care delivery. The collaboration level was excellent considering the tight schedules and responsibilities of all participants. Participants' concern about insurance companies was pervasive. As a result of the study, my belief that HIT implementation as a growth enabler increased. I will leverage the results of this study with my professional network to increase awareness and to catalyze informed leadership.

### Conclusion

In this qualitative study, face-to-face semistructured interview was the instrument I used to collect data from experienced decision makers working at the SMEs. The findings from this study add to the existing literature on diffusion of innovation in the health care field. The results indicated that leaders are aware of HIT's importance and the challenges that are preventing or delaying its implementation. This study was pioneering because it addressed current needs and challenges for SMEs in Saudi Arabia.

In Section 1, I concentrated on the problem statement, the purpose, and the relevant literature review pertaining to the central research question of this study. I also included an in-depth review of literature related to my study's conceptual framework. Section 2 included the: (a) role of the researcher and participants, (b) research method and design, (c) population and sampling, (d) ethical research, (e) data collection, and (f) analysis techniques. Section 2 also included detail of the processes and procedures I utilized to assure the reliability and validity of this study. In Section 3, I included: (a) the

presentation of findings, (b) application to professional practice, (c) implications for social change, (d) recommendation for action, (e) recommendation for future studies, and (f) reflections.

The objective of this qualitative study was to explore and understand the strategies SME medical provider leaders need to address the issues associated with technology implementation. The central research question was: What strategies do SME medical provider leaders need to address operating inefficiencies associated with technology implementation? The participants of this study were leaders who are involved in the decision-making process and the operations of SMEs.

The findings from this study may facilitate the design and implementation of an advanced integrated health care delivery system. Based on the data analysis of interview responses, I identified four main themes: (a) strategies to address human resources, (b) strategies to address clinical teams, (c) strategies to address funding, and (d) strategies to address organizational and leadership alignment. The most referenced components, common to all four themes, were: (a) training, (b) system features and supporting infrastructure, (c) incentives, (d) external enforcement and insurance, and (e) implementation follow-up.

All emergent themes and strategies aligned with the adapted DOI framework of Wainwright and Waring (2007). Wainwright and Waring (2007) concluded that the adapted model enabled a more sophisticated understanding of the data in organizations that are considered difficult to study due to their professional disciplines, increasing dependence on health information technology, and their associated small business

cultures. The themes and strategies I identified presented a reflection of professional cultures and political contexts within the health care SMEs. The adapted model allowed addressing factors considered important to the DOI and not addressed in Rogers (2003) DOI framework.

The results of the data analysis provided the basis for several conclusions. Staff retention is a serious problem that most SMEs must address, and it is driven mainly by new labor regulations, employee benefits, and competition. As concluded by Yusuf (2014), qualified staff should not stay idle waiting for employment by the government. Yusuf argued that SMEs should retain qualified staff and encourage them to work in the private sector by offering good salaries and benefits. All participants unanimously agreed training of human resources, clinical and non-clinical, is a key strategy for increasing the DOT. The analysis of participants' data demonstrated a strong need for qualified staff, periodical training for medical and non-medical staff, and a change management process to support HIT implementation. Lack of qualified staff is a problem that could be addressed by training but is not enough a solution by itself. Need exists for change management programs that support HIT implementation, especially for clinical teams, and in particular, physicians who claim that they are overwhelmed with work pressure.

The findings also revealed that funding is not a critical problem as long as the value of HIT is demonstrated. Funding is not a critical problem to SMEs because information systems are relatively affordable, and the return on investment is visible. Demonstrating system value facilitates obtaining funds from owners who are mainly

focused on making profits. Insurance companies influence the SMEs' decision-making process and affect their internal operations. Insurance companies' policies and strategies can also catalyze SME owners to invest in HIT.

A top priority for leadership is to communicate the HIT value to staff, follow-up on the implementation to address obstacles, and provide the needed infrastructure for implementation. Systems should be easy, address staff needs, and bring visible value to staff and patients. Incentives, monetary and moral, remain to be as an enabler for HIT implementation, but not a *singular* solution. Finally, the themes and strategies I identified in this study may guide and inform SME leaders on where to focus on accelerating HIT implementation in a constructive manner. As HIT implementation diffuses among SMEs, service levels can improve, and business value should increase.

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## Appendix A: Arnaout Inquiry of Elements Contributing to Technology Diffusion

### Research Questions

1. What is your experience with strategies needed to address the human resource element, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
2. What is your experience with strategies needed to address clinical teams' role, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
3. What is your experience with strategies needed to address technology funding, as it pertains to accelerating the diffusion of technology as a growth enabler, in your company?
4. What is your experience with strategies needed to address organizational leadership and alignment, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
5. What additional information you would you like to add.

## Appendix B: Participant Consent Form Arnaout Doctoral Study

You are invited to take part in a study of the diffusion of technology in small to medium medical service providers in Saudi Arabia. The researcher is inviting individuals who are involved in the decision-making process of adopting new technologies to be in the study. This form is part of a process called “informed consent” to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Ziad Arnaout, who is a doctoral student at Walden University.

### Background Information:

The purpose of this proposed qualitative phenomenological study is to explore knowledge elements that SMEs leaders need to accelerate diffusion of health information technology as growth enabler.

### Procedures:

If you agree to be in this study, you will be asked to:

- Dedicate 30 minutes for the research interview. The interview audio will be recorded.

Here are some sample questions:

- 1) What is your experience with strategies needed to address the human resource element, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?
- 2) What is your experience with strategies needed to address clinical teams’ role, as it pertains to accelerating the diffusion of technology as a growth enabler in your company?

### Voluntary Nature of the Study:

This study is voluntary. Everyone will respect your decision of whether or not you choose to be in the study. No one at Supplier Partnership for the Environment or at your organization will treat you differently if you decide not to be in the study. If you decide to join the study now, you can still change your mind later. You may stop at any time.

### Risks and Benefits of Being in the Study:

Being in this type of study involves some risk of the minor discomforts that can be

encountered in daily life, such as stress or feeling of overwhelmed. Being in this study would not pose risk to your safety or wellbeing. Potential benefits of this study are to educate service provider SMEs decision makers on how to increase HIT adoption and prepare them for the decision-making process.

**Payment:**

Participation in this research is voluntary, and it is intended for the benefit of society and business community that you are part of. All participants will be provided with an executive summary of the research findings. Participants will not receive any compensation for participating in this study.

**Privacy:**

Any information you provide will be kept confidential. The researcher will not use your personal information for any purpose outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. Data will be kept secure in a lock box that only the researcher has access to. Data will be kept for a period of 5 years, as required by the university.

**Potential Conflict of Interest:**

The researcher of this study is in a professional role which may result in current or future business relationship with the participant and his/her company. This research is separate from the researcher's professional work, and the relationship between the researcher's role and the professional work shall be kept separate.

**Contacts and Questions:**

You may ask any questions you have now. Or if you have questions later, you may contact the researcher via email [ziad.arnaout@waldenu.edu](mailto:ziad.arnaout@waldenu.edu). If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 001-612-312-1210. Walden University's approval number for this study is 03-12-15-088242 and it expires on March 11th, 2014.

The participant should print and keep a copy of this consent form.

**Statement of Consent:**

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By signing below and sending the form back to the research, or by replying to this email with the words, "I consent", I understand that I am agreeing to the terms described above.

Printed Name of Participant

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Date of consent

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Participant's Signature

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Researcher's Signature

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### Appendix C: Interview Protocol

Interview: Exploring the strategies that SME leaders use to address the issues associated with technology implementation.

- a. I will greet the participant and identify myself as Ziad Arnaout, a doctoral student of Walden University, conducting a study on diffusion of innovation at SMEs in Saudi Arabia.
- b. I will thank the participant for taking the time to meet and respond to the interview questions about strategies that SME leaders use to address the issues associated with technology implementation.
- c. I will inform the participants before the interview on what to expect, in terms of the length and detail of the transcripts.
- d. I re-confirm that the participant identity will remain confidential by using pseudonyms and that participation is voluntary with the right to withdraw.
- e. I will ask the participants will be asked to read the consent form, ask any questions they may have and sign the consent form.
- f. The participant will be given a copy of the consent form for their records.
- g. I will start the iPhone voice recorder, and start by noting the date, time and location.
- h. I will state the pseudonym of the participant's name such as 'participant Z001' and note it down on my copy of the consent form and the interview will begin.
- i. The interview is expected to last 40 minutes to respond to the 4 questions. This may take less time but follow-up questions may be required as I explore the answers.
- j. At the end of the interview, I will thank the participant will for their time.
- k. I will inform the participant that a transcription will be sent for verification. Turn off the iPhone voice recorder.