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Health Information Technology Implementation Strategies in Zimbabwe

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This is to certify that the doctoral study by

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2016

Abstract

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MBL, Bindura University of Science Education, 2014

MBA, Frankfurt School of Finance and Management, 2006

MBChB, University of Zimbabwe, 1993

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The adoption rate of health information technology (HIT) remains low in developing countries, where healthcare institutions experience high operating costs and loss of revenue, which are related to systems and processes inefficiency. The purpose of this case study was to explore strategies leaders in Zimbabwe used to implement HIT. The conceptual framework of the study was Davis's technology acceptance model (TAM). Data were gathered through observations, review of organizational documents (i.e., policies, procedures, and guidelines), and in-depth interviews with a purposive sample of 10 healthcare leaders and end-users from hospitals in Zimbabwe who had successfully implemented HIT. Transcribed interview data were coded and analyzed for emerging themes. Implementation strategies, overcoming barriers to adoption, and user acceptance emerged as the themes most healthcare leaders associated with successful HIT projects. Several subthemes also emerged, including: (a) the importance of stakeholder involvement, (b) the importance of management buy-in, and (c) the low level of IT literacy among healthcare workers. The strategies identified in this study may provide a foundation on which healthcare leaders in developing countries can successfully adopt and implement HIT. The recommendations from this study could lead to positive social change by providing leaders with knowledge and skills to use information technology strategies to deliver better healthcare at lower costs while creating employment for local communities.

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Dedication

This doctoral study is dedicated to all those who believed in me throughout this journey. Without each of you, none of this would have been possible. To my wonderful children, Kudakwashe, Abraham, and Zoe. Never give up on learning. I hope I have shown you the way.

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I would like to thank my family for their unwavering support during this journey. Even when it seemed like the journey would never end, you have been there with a foot in my back. You were there telling me that it will be done. Your invaluable support was pivotal in this journey. To my children, Kudakwashe, Abraham, and Zoe— thank you for being patient and understanding with the time it has taken to finish this doctoral study journey. I hope that I have shown you by example the importance of learning. No matter what direction your future holds, never stop learning. I will always love you.

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Section 1: Foundation of the Study

The healthcare industry is undergoing rapid transformation; emerging issues include such needs as the acceptance of evidence-based medicine, telemedicine and electronic medical records, patient-centered care, international benchmarking, quality, and risk management (Institute of Medicine, 2012). The healthcare sector is industrializing, enabled through the power of connectivity to achieve greater efficiency and improved outcomes that satisfy demanding, informed consumers. Connectivity will reduce dependence on large, expensive facilities and give individuals greater control over their health and well-being (Institute of Medicine, 2012).

Health information technology (HIT) has become a crucial topic with evidence suggesting that its adoption has been slow in comparison to technology adoption in other industry sectors (Jamoom, Patel, Furukawa, & King, 2014). Various researchers have posited that healthcare technology can potentially reduce operational costs, reduce medical errors, and increase healthcare quality through improved healthcare processes (El-Kareh, Hasan, & Schiff, 2013; Zineldin, Zineldin, & Vasicheva, 2014). HIT adoption could eventually save more than $813 billion annually, prevent 200,000 adverse drug events, and enhance the doctor-patient relationship through increased communication (Kruse, DeShazo, Kim, & Fulton, 2014). Consequently, healthcare leaders now regard effective HIT as the solution to the many healthcare delivery challenges ranging from increasing costs, medical errors, and service quality issues (Palvia, Lowe, Nemati, & Jacks, 2012; Waterson, Hoonakker, & Carayon, 2013).

Background of the Problem

Healthcare leaders in developed nations regard HIT as the panacea for reducing costs and enhancing service quality in healthcare organizations (Palvia et al., 2012). HIT is gradually transforming healthcare delivery by improving safety and efficiency and by allowing cost-effective, timely, and patient-centered care (Walston, Bennett, & Al-Harbi, 2014). Additionally, HIT-enabled prevention and management of chronic disease could eventually double healthcare cost savings while increasing health and other social benefits (Kruse et al., 2014). However, the global adoption rate of information technology (IT) in healthcare has remained relatively low compared to other industries (Palvia et al., 2012). The low adoption rate is despite the decreasing costs and potential benefits of HIT in clinical decision-making processes (Dedrick, Kraemer, & Shih, 2013).

While there is increased recognition of the importance of HIT in reducing rising healthcare costs, significant challenges remain in its implementation (Turan & Palvia, 2014). Although numerous studies investigating HIT exist, very few are focused on developing countries (Palvia et al., 2012). According to Palvia et al. (2012), healthcare leaders in the developing world can make informed decisions about HIT investments and adopt efficient technologies by understanding the strategic IT issues. High-level policy makers can define better strategies and policies for their countries' healthcare systems by having access to IT (Palvia et al., 2012). This background prompted my further investigation into HIT as explained in the following problem statement.

Problem Statement

Over the last few decades, IT has significantly altered the nature of work and organizational structures in many industries, including healthcare (Palvia et al., 2012). Research confirms that healthcare organizations could achieve up to 10% savings in operational costs, increased revenue, and improved patient outcomes as a result of successful implementation of HIT (Blecker et al., 2014). However, the adoption rate of HIT remains depressed in developing countries where the investment in HIT constitutes less than 1% of the total investment in healthcare (Turan & Palvia, 2014). The general business problem was that healthcare institutions in developing countries such as Zimbabwe—the focus country for this study—experience high operating costs and loss of revenue due to inefficiencies in systems and processes. The specific business problem was that some healthcare leaders in Zimbabwe lack strategies to implement HIT.

Purpose Statement

The purpose of this qualitative multi-case study was to explore the strategies healthcare leaders in Zimbabwe use to implement HIT. I collected data from healthcare leaders and end-users working in three Zimbabwean hospitals that have successfully implemented HIT. The findings from this study could contribute to business practice by providing a compilation of strategies used by healthcare leaders in the successful adoption and implementation of HIT in developing countries. The results from this study could lead to positive social change by providing leaders with knowledge and skills to use IT strategies to deliver better healthcare at lower costs while creating employment for local communities.

Nature of the Study

I chose a qualitative methodology for this study. The qualitative method is appropriate when the research purpose is to explore business processes or how people make sense and meaning of their lived experiences (Yin, 2011). Qualitative research promotes deep understanding of a phenomenon through the examination and interpretation of meanings assigned to experiences and realities by individuals (Denzin & Lincoln, 2011). To adequately answer the research question, I needed a deep understanding of the phenomenon that could best be gained through in-depth interviews and open-ended questioning; hence, I used a qualitative approach.

Quantitative researchers concentrate on the application of mathematical logic to phenomena to test a theory or examine causal interactions (Rubin & Rubin, 2012). Mixed methods research involves the use of both quantitative and qualitative methods to study a phenomenon (Denzin & Lincoln, 2011). The mixed method is most useful when one method does not provide a complete understanding of the study topic. In this study, the qualitative method more adequately addressed the research question. Accordingly, I did not select a quantitative or a mixed methods research approach for the study as the qualitative method fitted the research question of exploring HIT implementation strategies through multiple data sources including in-depth interviews, observations, and documents review, rather than statistically explain causal relationships.

Specifically, I chose the multi-case study design for this study because this design is suitable for the exploration of a particular phenomenon and enables the investigation and description of the phenomenon within a particular, contemporary context (Snyder,

2012; Yin, 2014). The case study research approach facilitates the exploration of phenomena within existing context using diverse data sources (Ketokivi & Choi, 2014). Accordingly, I examined the issue under investigation through a variety of lenses that allowed for discovering and understanding multiple facets of the phenomenon (Cronin, 2014; Snyder, 2012; Yin, 2012). Because case studies are rich in information gathered from multiple data sources, they can give insight into phenomena that a researcher cannot gain in any other way (Yin, 2013). A multi-case study design was an excellent fit because the exploration of HIT implementation strategies required information derived from multiple data sources.

Other qualitative designs include phenomenology, ethnography, and grounded theory (Christensen, Johnson, & Turner, 2014; Zivkovic, 2012). In phenomenology, researchers collect data primarily through interviews (Marshall & Rossman, 2016), potentially weakening the preferred depth and scope of exploration for the study. In this study, observations and document reviews were critical to achieving the research purpose; thus, the phenomenological design was a less suitable alternative. Ethnography centers on extended cultural examination (Murthy, 2013), which was not the focus of this study. Grounded theory design centers on theory derivation from field data collection (Rubin & Rubin, 2012). Since the purpose of this study was to explore the rich case data and not to build theory, grounded theory was not suitable.

Research Question

The central research question for this study was: What strategies do healthcare leaders in Zimbabwe use to implement health information technology?

Interview Questions

Using an interview protocol, I asked each participant the following interview questions (Appendix B).

1. What strategies have you used to implement health information technology (HIT)?
2. Which of these strategies worked best?
3. What were the critical success factors?
4. What barriers did you encounter, and how did you overcome them?
5. How well has the organization achieved user acceptance?
6. What factors influenced user acceptance?
7. What, if any, were the concerns regarding adoption and implementation?
8. What training, development, or policy influenced the implementation process?
9. What has been the effect of HIT adoption and implementation in the organization?
10. Do you have anything else to add that I have not asked about HIT implementation?

Conceptual Framework

I used the technology acceptance model (TAM), developed by F. D. Davis in 1986, as the conceptual framework for this study. The model, designed specifically to explain computer usage behavior, is an adaptation of Fishbein and Ajzen's (1975) theory of reasoned action (TRA), which has been successful in predicting and explaining behavior in general (Al-Suqri & Al-Kharusi, 2015; Marangunić & Granić, 2014). Davis

(1986) maintained that the attitude towards use, perceived usefulness, and perceived ease of use of the application determined individual adoption or usage of information technology systems.

Perceived usefulness (PU) refers to the degree to which a person believes using a particular system would enhance his or her job performance while *perceived ease of use* (PEOU) is the extent to which a person believes using a particular system would be free of effort (Davis, 1989). In line with the TRA, Davis, Bagozzi, and Warshaw (1989) expected these perceived characteristics to influence intentions to use a system, which, in turn, could influence actual system usage. According to the TAM theory, improvements in ease of use of a system contribute to increased usefulness resulting from saved effort (Davis et al., 1989). Though not averse to technology, end-users are likely to resist the use of systems they view as inadequate or as interfering with their values, aspirations, and roles (Cresswell, Worth, & Sheikh, 2012; Cresswell & Sheikh, 2014). The technology acceptance model, therefore, provides an excellent basis for understanding technology adoption in healthcare.

Operational Definitions

Health information technology (HIT). The application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making (Kim & Park, 2012).

Technology acceptance. The demonstrable willingness within a user group to employ information technology for the tasks it is designed to support (Marangunić & Granić, 2014).

Developing country. A country with low-income to middle-income economy, as measured on a per capita income basis (World Bank Group, 2012).

Productivity. A measure of the contribution of inputs relative to the outputs and how the contribution affects an organization's profitability and competitiveness (Fleming et al., 2014).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions in a study are issues that are somewhat out of the control of the researcher (Kirkwood & Price, 2013). One assumption was that the interview sample represented the population of hospital executives and employees with HIT experience. Another key assumption was that all participants spoke English and understood the interview questions. That hospital executives have a final say in HIT adoption decisions was also an assumption in this study. An equally important assumption in this study was that interview respondents would answer the questions honestly instead of answering how the respondent believed the researcher wanted the questions answered.

Limitations

Limitations of a study are potential weaknesses that are out of the researcher's control (Brutus, Aguinis, & Wassmer, 2013; Kirkwood & Price, 2013). One limitation was the fact that some hospitals did not provide all the necessary documents required by

the researcher due to organizational policies. In addition, conducting interviews via the telephone, as was the case for some interviews, was also a limitation as this communication mode precluded observation of body language and mannerism.

Delimitations

Delimitations are those characteristics that limit the scope and define the boundaries of a study (Yin, 2014). Delimitations are under the researcher's control. Delimiting factors may include the choice of objectives, the research questions, variables of interest, theoretical perspectives adopted, and the chosen population (Yin, 2014). The scope of this study was a qualitative case study to explore the HIT implementation strategies used by healthcare leaders in Zimbabwe. Only individuals with experience in adoption and implementation of HIT from hospitals in one Zimbabwean city participated in the study.

Significance of the Study

Contribution to Business Practice

According to Palvia et al. (2012), healthcare leaders in the developing world can make improved decisions about HIT investments and adopt efficient technologies by understanding strategic HIT issues. Also, high-level policy makers can define better strategies and policies for their countries' healthcare systems by having access to HIT (Palvia et al., 2012). The findings from this study might contribute to these desired business practices by providing a compilation of strategies leaders need in the adoption and implementation of HIT in Zimbabwe. These strategies might also prompt successful HIT implementation and thus lead to reduced turnaround times and increased profitability

due to optimized processes. The findings could also provide a basis on which healthcare leaders can utilize HIT to improve patient outcomes that will, in turn, improve hospital competitiveness and profitability.

Implications for Social Change

Improved decision making positively affects society thereby acting as a catalyst for social change. Embracing HIT could result in improved healthcare decisions and in positively influencing the patients' experience. The results of this study should affect social change by providing leaders with knowledge and skills to use HIT as a key strategy to yield more and better healthcare at lower costs while creating employment for communities. Positive social change can occur through improving patient experiences in healthcare as superior satisfaction aligns with a higher quality of care. Positive social change may, in turn, lead to increased profitability of the healthcare institutions. HIT also provides healthcare organizations a valuable platform through which leaders can improve business decisions. By using HIT, healthcare organizations can position themselves more competitively in the industry while focusing on initiatives that can improve the quality of care (Palvia et al., 2012).

A Review of the Professional and Academic Literature

Notwithstanding the rapid transformation of the healthcare sector in terms of technology and market focus, there is still debate regarding the benefits of HIT adoption (Institute of Medicine, 2012). In this literature review, I examined existing evidence on the challenges and benefits of adopting and implementing HIT, particularly in developing countries such as Zimbabwe. The review also focused on exploring strategies used in

successfully implementing HIT. Peer-reviewed journal articles, along with books and government publications, were the sources of information in this literature review.

The literature review begins with an overview of information technology in healthcare. A review and synthesis of literature on the impact and benefits of HIT is next, with a focus on productivity, quality, and healthcare outcomes. I then include a review of evidence on HIT adoption in developing countries with emphasis on the adoption strategies, challenges, and barriers. A detailed examination of the extant literature on the proposed conceptual framework for the study, the TAM, is next. The TAM review includes a discussion of contrasting theories, as well as the applicability of the TAM to technology adoption in healthcare. I dedicate the last part of the review to how developing nations can successfully overcome adoption barriers and successfully implement HIT, stating how the information reviewed informs the present study.

I accessed research materials in databases including ProQuest, EBSCOhost, Science Direct, and Sage Publications through the Walden University Library. I performed additional searches using commercial search engines such as Google Scholar. Information search involved using various keywords such as: *information technology, health information technology, health IT, health technology, technology implementation strategies, technology adoption barriers, technology acceptance models, technology and healthcare, HIT in developing countries, the business case for HIT, HIT challenges, and benefits,* or a combination of these keywords. The entire study contains 211 referenced works with 92% peer-reviewed and 189 (89%) within the mandatory five-year period

(2012-2016). There are 140 works cited in the literature review, of which 131 (93%) are peer-reviewed and 126 (89%) published between 2012 and 2016.

Technology in Healthcare

While technology usage in other industries such as aviation, banking, and manufacturing has become the driving force for competitive advantage, the healthcare sector is lagging behind (Khalifa, 2013). Companies often attribute competitive edge, in part, to leadership superiority in technology (Bolívar-Ramos, García-Morales, & García-Sánchez, 2012; Sheng, 2013). However, the same is not true about IT in the healthcare sector where the preoccupation is on maintaining the personalized physician-patient relationship. Physicians regard the practice of medicine as a demonstration of personal dexterity and an expression of the physician-patient relationship (Blavin & Buntin, 2013; Steininger & Stiglbauer, 2015). Another perception is that technology may threaten the holistic approach to healing, leading to unknown technology-induced errors and mishaps (Goldberg, Mick, Kuzel, Feng, & Love, 2013).

For decades, technology has been used to facilitate various processes in healthcare but remains largely untapped at the core of healthcare delivery (Patil & Patil, 2014). Progress is evident in the development of tools that humans can manipulate while delivering healthcare services. Notable technology advancements in healthcare include imaging technology, pharmaceutical software, laboratory technology, as well as results delivery and integration systems for diagnostics (Institute of Medicine, 2012). Information technology in healthcare diagnostics has been revolutionary, and this area remains the backbone of HIT (Patil & Patil, 2014).

A plethora of challenges including human resources, infrastructure, shortage of medicines, the ever-escalating cost of healthcare, increasing diseases burden, emerging diseases, and increased mortality are bedeviling the health sector (Sarkis & Mwanri, 2013). The Institute of Medicine (IOM), in its 1999 report, *To err is human: Building a safer health system*, noted that between 44,000 and 98,000 people die in hospitals each year as a result of preventable medical errors (Kohn, Corrigan, & Donaldson, 1999). According to this report, preventable medical errors in hospitals exceed deaths attributable to such feared threats as motor-vehicle wrecks, breast cancer, and AIDS. The committee noted that, despite the cost pressures, liability constraints, resistance to change and other seemingly insurmountable barriers, it is simply not acceptable for patients to be harmed by the same health care system that is supposed to offer healing and comfort (Kohn et al., 1999). One of the main conclusions of the report is that the majority of medical errors do not result from individual recklessness or the actions of a particular group (Kohn et al., 1999). The report further noted faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them frequently cause errors. The IOM observed that designing a safer health system in which making errors is more difficult is the best way of avoiding mistakes. The IOM recommended widespread adoption of technology in healthcare as one of the possible solutions to the challenge of medical errors. The report also highlighted that one of the advantages of technology is performance enhancement attributable to the synergy of human effort and technology (Kohn et al., 1999).

Though progress in HIT adoption is evident, acceptance remains low in most countries more than a decade after *To err is human* (Furukawa, Patel, Charles, Swain, & Mostashari, 2013; Turan & Palvia 2014). The low acceptance of HIT is not only a problem in the U.S. but also in all developed countries, and the story is worse in the developing world (Palvia et al., 2012; Turan & Palvia, 2014). It remains a mystery why the healthcare sector is not ahead of all the other industries in technology when logic dictates that technology could be a solution to problems in the industry.

Health Information Technology Benefits

Potential benefits. Information technology can provide greater ability to streamline and standardize processes, share and analyze patient information, as well as improve access to care (Kretschmer, 2012; Lee, McCullough, & Town, 2013; McCullough, Parente, & Town, 2013; Turan & Palvia, 2014; Zineldin et al., 2014). Efficient access to financial, technical, and healthcare information plays a crucial role in improving the living standards of people in underdeveloped countries (Bishop, Press, Mendelsohn, & Casalino, 2013; Turan & Palvia, 2014). Healthcare leaders the world over are increasingly recognizing the importance of IT in reducing increasing healthcare costs and enhancing service quality, but significant challenges remain in its implementation (Agha, 2014; Bardhan & Thouin, 2013; Whipple, Dixon, & McGowan, 2013; Turan & Palvia, 2014). Although numerous studies have examined critical IT issues in healthcare in developed countries, literature on HIT issues in developing countries is limited (Palvia et al., 2012; Turan & Palvia, 2014). A review of the extant literature indicated that the adoption of HIT has met with various challenges that have slowed the adoption rate in

both developed and developing countries (Akhlaq, Sheikh, & Pagliari, 2015; Gagnon, Desmartis et al., 2012; Jamoom et al., 2014; Palvia et al., 2012; Phichitchaisopa & Naenna, 2013).

Gaps in literature. The focus of the majority of the studies on HIT has been on adoption, negating the impact of HIT on productivity, and healthcare quality outcomes (Chou, Chuang, & Shao, 2014; McCullough et al., 2013). There is evidence that HIT adoption after the IOM report (Kohn et al., 1999) has been improving, but no single adoption model can be considered the best for HIT adoption. Stakeholders in healthcare are agreed on the potential benefits of HIT, which include improved competitiveness, increased productivity, and quality enhancement (Agha, 2014; El-Kareh et al., 2013; Finney Rutten et al., 2014; Risko et al., 2014; Whipple et al., 2013). Furthermore, healthcare providers are unanimous that HIT may be the panacea for medical errors, infrastructural challenges, and information asymmetry (El-Kareh et al., 2013; Walsham, 2012).

Medical errors and HIT. Reduction of medical errors is one of the most important uses for HIT (El-Kareh et al., 2013). In the banking and aviation industries, IT has proven effective in reducing errors related to human decisions (Turan & Palvia, 2014). Electronic access to complete patient health information can substantially reduce medical errors resulting from knowledge gaps regarding issues such as allergies, relevant medication and laboratory information, past medical history, and poor communication among providers (Risko et al., 2014; Wears, 2015). HIT systems, such as automated decision-making and knowledge acquisition support tools, can integrate electronic patient

information directly into medical practices in a seamless and complementary way (Palvia et al., 2012). This integration can reduce errors of omission that result from gaps in provider knowledge or the failure to synthesize and apply that knowledge in clinical practice.

Quality and HIT. Various researchers noted that patients perceived that HIT improved the quality of healthcare services (Aggelidis & Chatzoglou, 2012; Freedman, Lin, & Prince, 2015; Zineldin et al., 2014). Aggelidis and Chatzoglou (2012) noted improved customer satisfaction from electronic health record (EHR) use while others reported reduced medical errors (Zineldin et al., 2014) and improved information availability (Freedman et al., 2015). Zinszer, Tamblyn, Bates, and Buckeridge (2013) identified improved communication, increased awareness of the need for interoperable systems, and improvement in data standardization as benefits of HIT in public health. HIT also resulted in improvements in queue management, savings on stationery costs, and elimination of bottlenecks as well as a significant reduction in paper related job functions (Jones, Heaton, Rudin, & Schneider, 2012). Bardhan and Thouin (2013) investigated the impact of HIT applications on process quality associated with evidence-based measures for treatment of four major health conditions. The results indicated that not-for-profit and urban hospitals were more likely to exhibit greater compliance with process quality metrics than rural hospitals while for-profit hospitals exhibited lower operational costs (Bardhan & Thouin, 2013). There was a positive association between usage of clinical information systems and patient scheduling applications and

conformance with best practices for treatment of heart attacks, heart failures, and pneumonia (Bardhan & Thouin, 2013).

Cost and productivity impact. Several studies demonstrated a positive effect of HIT on productivity and cost savings (Agha, 2014; Bardhan & Thouin, 2013; Buntin, Burke, Hoaglin, & Blumenthal, 2011; Sheikh, Nurmatov, Cresswell, & Bates, 2013). Buntin et al. (2011) observed that 92% of recent articles on healthcare technology concluded that HIT had positive benefits in both small and large organizations. Dedrick et al. (2013) noted that developing countries with higher incomes achieved significant gains from IT investment. Country factors such as human resources, investment climate, and the quality and cost of telecom infrastructure affect IT productivity (Chou et al., 2014; Dedrick et al., 2013; Sarkis & Mwanri, 2013; Waterson et al., 2013). All countries could benefit from IT investments provided policies that support IT investments are in place (Dedrick et al., 2013). Developing nations, on the other hand, suffer from policy inconsistencies because they have to choose from among numerous other projects in the distribution of scarce resources (Ahlan & Ahmad, 2014; Maumbe, Shivute, & Owei, 2011).

In a study of the impact of HIT applications on hospital operating costs, Bardhan and Thouin (2013) observed a positive correlation between the use of financial management systems and lower hospital operating expenses. On the other hand, studies have also shown that while technology in healthcare has an impact on stationery costs, it is a fallacy to believe that a paperless office is feasible (Caldeira, Serrano, Quaresma, Pedron, & Romão, 2012; Payne et al., 2013). Obstacles to the creation of a paperless HIT

environment range from lack of computer skills and legal requirements to the documentation required in coming up with a diagnosis (Ben-Assuli, 2015; Caldeira et al., 2012).

In a study on the impact of HIT on hospital productivity, Lee et al. (2013) noted that healthcare leaders regarded HIT as a tool that could transform healthcare delivery. However, Lee et al. also observed that increased HIT investments did not lead to a corresponding increase in the contribution to value-addition. In addition, not-for-profit organizations invested more heavily and differently in HIT than for-profit organizations (Lee et al., 2013). It was evident from these findings that ownership structures affect hospitals' HIT adoption strategies.

Devaraj, Ow, and Kohli (2013) examined the role of IT on patient flow and its consequences for improved hospital efficiency and performance using the lens of the theory of swift and even flow. The results showed a positive association between IT and swift and even patient flow and improved revenues. The results also indicated that the improvement in financial performance was not at the expense of quality. Further, Devaraj et al. (2013) found differential effects of swift flow and even flow on various measures of hospital performance. Devaraj et al. also noted that, although swift flow affects financial performance, even flow primarily affects quality performance. However, swift flow and even flow have a mutually reinforcing overall impact on hospital performance. Fleming et al. (2014) and Goldsack and Robinson (2014) both showed that staffing and practice expenses increased following EHR implementation. Productivity, volume, and net income decreased initially but recovered close to pre-implementation levels after 12

months (Fleming et al., 2014). The increase in expenses following EHR implementation was moderate and not as persistent as anticipated.

HIT Adoption in Developing Countries

Adoption of HIT in the developing world is lagging behind its adoption in developed countries (Ahlan & Ahmad, 2014; Piette et al., 2012; Turan & Palvia, 2014). Several factors influence adoption of HIT in the developing countries ranging from lack of resources to lack of skills (Ahlan & Ahmad, 2015; Khalifa, 2013). HIT projects receive low priority in developing countries because of the huge investments required for successful HIT implementation (Khalifa, 2013).

Notwithstanding these factors and despite numerous challenges, HIT implementation has progressed significantly in developing countries (Khalifa, 2013). In an assessment of a new e-healthcare system in Ghana, Bedeley and Palvia (2014) observed that both consumers and providers cited a lack of information communication technology (ICT) infrastructure as the weakest link. In a study in Nigeria, Adeleke, Erinle, Ndana, Anamah, Ogundele, and Aliyu (2014) reported that implementation challenges include those caused by political and economic instability, poor telecommunication infrastructure, inadequate monetary and human resources, interruptions in electricity and water supplies, corruption, and cultural influences. These findings are similar in the majority of developing nations that have a high poverty level (Ahlan & Ahmad, 2015; Bedeley & Palvia, 2014; Luna, Almerares, Mayan, González Bernaldo de Quirós, & Otero, 2014; Mutale et al., 2013). The other issues included lack

of basic knowledge in ICT, internet availability, financial and sustainability issues, and security issues (Bedeley & Palvia, 2014; Smith, Ash, Sittig, & Singh, 2014).

In response to the increased penetration of ICT in Africa, Jimoh, Pate, Lin, and Schulman (2012) investigated the potential to develop a model of ICT adoption by health workers in Africa. Jimoh et al. (2012) noted worker preference for ICT application in health varied across worker groups and conflicted with government/employer priorities. According to Jimoh et al., endemic barriers to technology are an important addition to the TAM in low-resource settings such as developing countries. These researchers also identified end-user preference as an important human factor that leaders should consider in developing a suitable ICT implementation strategy in developing countries. These findings provided insights into the intricacies involved in the deployment of healthcare IT in low-resource settings as is the case in the majority of sub-Saharan Africa.

Singh, Lichter, Danzo, Taylor, and Rosenthal (2012) conducted a national assessment of HIT in rural primary care offices with particular attention to EHR adoption, the range of capabilities in use, and plans for adoption. Singh et al. (2012) found no significant difference in HIT adoption and use between rural and urban primary care offices. They also noted that the situation is, however, dynamic and warrants further monitoring. These findings demonstrate the need to prioritize HIT in both urban and rural areas, as there are no significant differences in the adoption rate.

Hassibian (2013) found that despite the benefits of HIT in healthcare services, the acceptance rate of HIT in developing countries was disturbingly low. Hassibian concurred with previous research (Khalifa, 2013; Turan & Palvia 2014) that lack of

infrastructures in ICT, cost, and cultural resistance are the main barriers for developing countries in the acceptance and implementation of HIT. Understanding and realizing the society's healthcare delivery systems' weaknesses are the key factors for the successful acceptance and implementation of EHRs in any developing country (Hassibian, 2013).

Abdullah (2013) noted that most HIT developers are from the developed countries. For this reason, it is possible that the current HIT systems are not generic enough and, therefore, pose challenges to global adoption, particularly in developing nations (Abdullah, 2013, Palvia et al., 2013). Culture plays a pivotal role in any change process, of which HIT implementation is clearly one (Schwarz, Chin, Hirschheim, & Schwarz, 2014). Developing countries have work practices and cultures that are different from those of developed nations; therefore, software customization is often unavoidable (Sultan et al., 2014). These differences present a possible challenge to the adoption of HIT due to the 'fit' problem between the system and work practices, thereby causing implementation delays and failures (Abdullah, 2013; Turan & Palvia, 2014).

Support from top management positively influenced the generation of technological skills, distinctive competencies, and organizational learning (Bezboruah, Paulson, & Smith, 2014; Birken et al., 2015). Distinctive technological competencies and organizational learning positively affected organizational performance through organizational innovation (Bolívar-Ramos et al., 2012; Thakur, Hsu, & Fontenot, 2012). Bolívar-Ramos et al. (2012) observed the sources of sustainable competitive advantage centered on a set of distinctive technological competencies and other capabilities present in organizations. Managers should, therefore, emphasize the fostering of distinctive

technological competencies, organizational learning, and organizational innovation as these emphases can have positive effects on improving organizational performance (Bezboruah, Paulson, & Smith, 2014; Birken et al., 2015; Bolívar-Ramos et al., 2012; Chae, 2012).

In developing countries, infrastructural challenges are among the major barriers to HIT adoption (Ahlan & Ahmad, 2015; Bedeley & Palvia, 2014). Most developing countries are grappling with providing rudimentary physical structures from which to provide healthcare. Access to healthcare is limited, and priority is on infrastructural development to increase access than on improvements such as HIT (Bishop et al., 2013; Khalifa, 2014). Leaders in developing countries have also noted that technology can break the infrastructural barriers by increasing access to healthcare through telecare and telemedicine facilities (Gheorghe & Petre, 2014; Van Dyk, 2014). The recent upsurge in cellular technology in developing countries also provides an opportunity to leverage technology in the form of e-health (Kvedar, Coye, & Everett, 2014). In this regard, there has been some development in tele-access, but the lack of technology infrastructure remains a major obstacle (Mars, 2012; Schwamm, 2014).

Political discord and policy inconsistencies on the part of governments have stalled progress in HIT implementation in most developing countries (Adeleke et al., 2014). Legal frameworks also need to be in place to allow for deliberate policy decisions that accelerate technology uptake in the healthcare sector (Ben-Assuli, 2015). Sadly, it may not be prudent to channel critical funding to technology development while most people have no basic food, shelter, and sanitation (Dedrick et al., 2013). Another factor

found to contribute to the development of unsustainable HIT in developing nations was the misalignment of the interests, roles, and responsibilities of the players involved in the process, namely the donors, developers, and government officials (Bolívar-Ramos et al., 2012; Sheng, 2013).

In a survey from Ghana, Yusif and Jeffrey (2014) noted the top priority e-health objectives in Africa included providing health education for health professionals and improving primary health care services. However, the lack of skills and human resources, socioeconomic issues, and technology infrastructure problems remain as obstacles; and these challenges lead many developing countries to struggle to adopt HIT (Roberts & Grover, 2012). Due to these difficulties, many developing nations may not be able to realize or sustain the potential benefits of HIT. Such a paradox is the scenario that developing countries find themselves in; and, in as much as technology adoption in healthcare may be the panacea, how to make the right priority remains a challenge to many nations.

Thus, the cycle remains of lack of infrastructure, lack of resources, increased diseases burden, lack of access, poor infrastructure, and so on. There is a need for a holistic approach to HIT adoption, and the purpose of this study is to explore existing HIT strategies used by leaders in developing countries and proffer solutions. While various HIT implementation models exist, the technology acceptance model (Davis, 1986) may provide a framework for successful HIT implementation, particularly in developing countries.

The Technology Acceptance Model

I used the technology acceptance model (TAM) developed by F. D. Davis in 1986 as the conceptual framework for this study. Davis designed TAM as an adaptation of Fishbein and Ajzen's (1975) theory of reasoned action (TRA), which has been successful in predicting and explaining behavior in general and in explaining computer usage behavior in particular (Marangunić & Granić, 2014; Silva, 2015). In the model, Davis presumed a mediating role of two variables—called perceived ease of use (PEOU) and perceived usefulness (PU)—in a complex relationship between system characteristics (external variables) and potential system usage (Marangunić & Granić, 2014; Yucel & Gulbahar, 2013). *Perceived usefulness* (PU) refers to the degree to which the person believes that using the particular system will enhance job performance whereas the *perceived ease of use* (PEOU) relates to the extent to which the person believes that using the particular system will be free of effort (Marangunić & Granić, 2014; Yucel & Gulbahar, 2013).

Emergence and advancement of the TAM. In his conceptual model for technology acceptance, Davis (1986) suggested that the actual usage of the system is a response that can be explained or predicted by user motivation. Davis further refined his conceptual model to propose the TAM by suggesting that three factors—PEOU, PU, and attitude toward using technology—explained a user's motivation (Figure. 1).

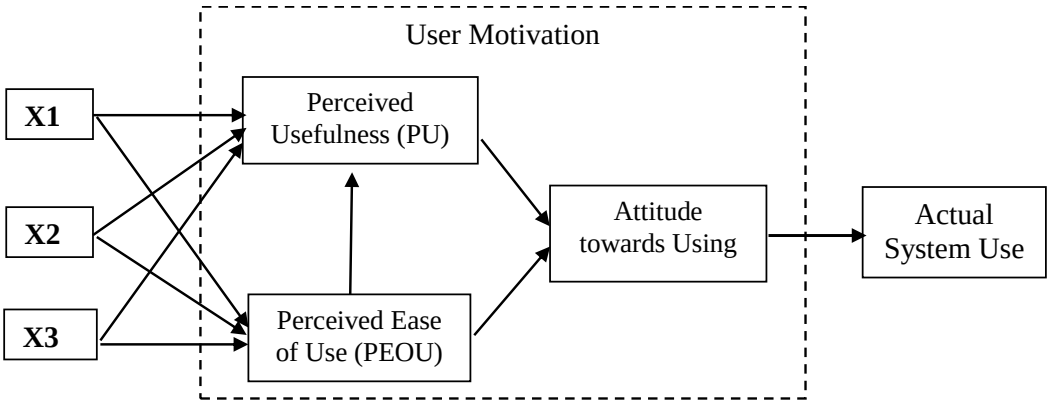

Figure 1. Technology acceptance model. Adapted from " Technology acceptance model: A literature review from 1986 to 2013," by Marangunić & Granić, 2014, *Universal Access in the Information Society*, *14*, 81–95.

Davis hypothesized that the attitude of a user toward the system was a major determinant of whether the user will employ or reject the system. The attitude of the user, in turn, was considered to be influenced by two major beliefs, PU and PEOU. System design characteristics (represented by X1, X2, and X3 in Figure. 1) directly influenced both PEOU and PU. Davis and his associates additionally found that attitude did not fully mediate the PU and the PEOU.

Subsequent developments. Subsequent TAM development included behavioral intention as a new variable that was directly influenced by the PU of the system (Davis et al., 1989). Davis et al. (1989) suggested that there would be cases when an individual might form a strong behavioral intention to use the system without forming any attitude, thus giving rise to a modified version of TAM. An additional change brought to the original TAM was a consideration of other factors, referred to as external variables, that might influence the beliefs of the person toward the system. The external variables

typically included system characteristics, user training, user participation design, and the nature of the implementation process (Davis, 1989).

Over time, other researchers applied and proposed several additions to the model with TAM evolving into a dominant model for explaining and predicting system use (Marangunić & Granić, 2014; Silva, 2015). An example is Venkatesh and Davis's extended model named TAM 2 (Figure 2) that positioned PU as the major determinant of the intention to use technology (Marangunić & Granić, 2014). In TAM 2 Venkatesh and Davis (2000), identified (a) subjective norm, (b) image, (c) job relevance, (d) output quality, and (e) result demonstrability as variables that directly influenced perceived usefulness.

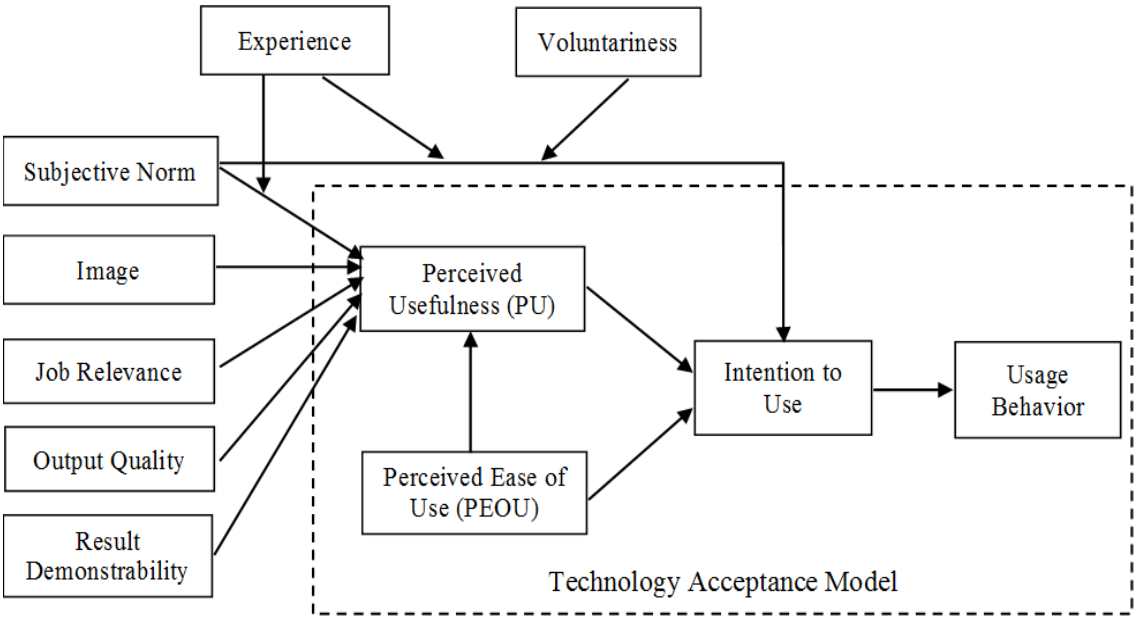

Figure 2. TAM 2. Adapted from " Technology acceptance model: A literature review from 1986 to 2013," by Marangunić & Granić, 2014, *Universal Access in the Information Society*, *14*, 81–95.

Several other technology acceptance models different from TAM exist including the diffusion of innovation theory (Miller, 2015), the swift and even flow theory (Devaraj et al., 2013), and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh, 2015). UTAUT comprises three direct determinants of behavioral intention—performance expectancy, effort expectancy, and social influence—as well as intention and facilitating conditions, the two direct determinants of use behavior (Venkatesh, 2015).

Despite the existence of rival models, TAM has evolved to become the key model in understanding and predicting human behavior towards potential acceptance or rejection of technology (Marangunić & Granić, 2014). Several studies have confirmed the strength of the model, emphasizing its broad applicability to various technologies (Ghazizadeh, Lee, & Boyle, 2012; Ketikidis, Dimitrovski, Lazuras, & Bath, 2012). Ghazizadeh et al. (2012) posited that the original TAM could not adequately explain technology acceptance in mandatory settings. Further research in areas such as the moderating role of individual variables, incorporation of additional variables, investigation of actual usage and its relationship to objective outcome measures, and target group of older adults will help strengthen TAM (Heart & Kalderon, 2013).

Technology acceptance in healthcare. Although some industries have accepted TAM as a standard model for technology acceptance, there has been a concern with the model's assumption that technology acceptance is voluntary (Moores, 2012). Likewise, the blanket application of TAM (or its modifications) to healthcare may not completely explain technology acceptance of HIT. HIT adoption requires the active participation of

all users, who should conform to the new technology to achieve maximum potential benefits (Holden & Karsh, 2010). Hence, to use TAM alone to explain acceptance or resistance to technology use in healthcare is inadequate.

Holden and Karsh, (2010) reviewed the application of TAM to healthcare and concluded that, though the model predicts a substantial portion of the use or acceptance of HIT, the theory may benefit from several additions and modifications. The model needs to be adapted specifically to the healthcare context by using beliefs elicitation methods (Holden & Karsh, 2010). In line with previous studies of technology acceptance in healthcare settings, Ketikidis et al. (2012) reiterated the need for a modified version of existing TAM approaches to understand better healthcare professionals' acceptance of HIT systems. Ketikidis et al. also noted the importance of perceived ease of use, job relevance, and social norms, indicating that TAM2 was more appropriate for use in healthcare settings than the original TAM. Hameed, Counsell, and Swift (2012a) posited that leaders should view IT adoption, starting from initiation stage until the acquisition of innovation, as an organizational process. Management commitment is a critical success factor for HIT implementation regardless of the model adopted (Hameed et al., 2012a).

Kim and Park (2012) proposed another model, the healthcare information technology acceptance model (HITAM), that describes health consumers' attitudes and behavioral intentions when encountering HIT. In the model Kim and Park categorized the influential factors affecting the behavioral intention to use HIT into three domains called the health zone, information zone, and technology zone. In each zone, Kim and Park identified key factors as predicting factors that together formed the HITAM but with

varying ranges of significance and directional relationships. These included health status and health belief and concerns in the health zone; subjective norms and HIT reliability in the information zone; and HIT self-efficacy in the technology zone. It is possible to explain many aspects of consumer and provider HIT adoption behavior using this model, as it takes into account the various complexities of the healthcare delivery system. HITAM, therefore, provides a valuable model that leaders can use to develop strategies for successful HIT implementation.

Abbott, Foster, Marin, and Dykes (2014) examined HIT implementation processes and identified a set of implementation best practices, which could begin to address gaps in the HIT implementation body of knowledge. Deploying new technology and practice innovations in complex healthcare environments is challenging, particularly when the innovation is disruptive to established structures and workflow (Abbott et al., 2014; Schoville & Titler, 2015; Thakur et al., 2012). HIT and the electronic health record are considered disruptive technologies; thus, their integration into practice has been slow and problematic. Clinical environments are complex, unpredictable, and replete with intricate and highly inter-dependent relationships; hence, the context in which HIT implementation occurs strongly influences the process outcome (Abbott et al., 2014).

Hospitals and clinics fall therefore into the category of a complex adaptive system (CAS) (Igira, 2012). Implementations in a CAS requires creative and critical thinking; acceptance that each system is unique, complex, and continually changing; and an understanding that methods that work in one organization or location may fail in another (Abbott et al., 2014; Schoville & Titler, 2015). Abbott et al. (2014) also noted changes

over time, and the influence of the intervention itself on the environment will require a continual adaptation of the methods and models used to study the impact of the intervention. Applying traditional approaches to the evaluation of HIT implementation is insufficient to gain the level of appreciation necessary for understanding CAS (Abbott et al., 2014).

While healthcare leaders have successfully used TAM (as modified) in the implementation of HIT, the model still falls short of the requirements of a CAS (Schoville & Titler, 2015). Technology adoption in healthcare requires a dynamic model that accommodates the complexities of the discipline (Gagnon, Orruño, Asua, Abdeljelil, & Emparanza, 2012; Leung, 2012). In the final analysis, implementing HIT should not only be about how people accept technology in healthcare, but also how developers and vendors view healthcare when coming up with healthcare technology solutions. Technology implementation requires taking a broad look at who the users and beneficiaries of intended technology are and how those users, from the physicians to the patients, perceive technology and its impact particularly as it relates to any intrusions into their private lives (Schoville & Titler, 2015). Acceptance requires that healthcare leaders convince doctors that HIT will not deprive them of their independence but rather will facilitate the task of delivering healthcare more efficiently (Hikmet, Banerjee, Burns, 2012; Wright & Marvel, 2012).

HIT Adoption Factors and Barriers

Although the willingness of developing countries to accept and implement HIT is rising, there are challenges and obstacles, which will slow down progress due to the

multidisciplinary and complex characteristics of HITs (Hassibian, 2013; Igira, 2012). Lack of ICT infrastructures, cost, lack of skilled workforce, national policies, and cultural resistance are the main barriers to HIT implementation for developing countries (Ahlan & Ahmad, 2015; Ajami & BagheriTadi, 2013; Anwar, Shamim, & Khan, 2012; Filipova, 2013; Hassibian, 2013). Familiarity with these challenges and barriers will help developing countries have a better understanding of these problems and of how to successfully exploit HITs. The other notable barriers include lacking professional HIT staff, staff lacking computer skills, obtaining staff buy-in, lacking HIT products integration with other systems, lacking technical infrastructure and integration into local and regional networks, and time constraints (Campillo-Artero, 2012; Filipova, 2013).

Cultural barriers and autonomy. The issue of autonomy, with particular focus on ethics and confidentiality, remains a major barrier to HIT adoption (Blavin & Buntin, 2013; Keshavjeemj, Kuziemsky, Vassanji, & Ghany, 2013; Lin, Lin, & Roan, 2012; Mair et al., 2012; McAlearney, Hefner, Sieck, & Huerta, 2015). Goldberg et al., (2013) identified culture, leadership priorities, and values set by physicians as factors that influenced whether primary care practices engage in improvement efforts. Physician resistance is one of the major barriers to technology acceptance in healthcare (Chen & Hsiao, 2012; Graham-Jones, Jain, Friedman, Marcotte, & Blumenthal, 2012; Ubel & Asch, 2015). Among the reasons physicians are reluctant to adopt technology is the perceived losses of independence and control of the patient's care (Abdekhoda, Ahmadi, Gohari, & Noruzi, 2015; Pynoo et al., 2013). The perception is that technology-enabled healthcare will allow, among other things, sharing of patient information across practices,

physicians, and regions while also allowing easy access to information by the patient. Physicians believe this access may take away the independence and control from the primary doctor and the traditional model of healthcare, an untenable situation from the perspective of many doctors (Ubel & Asch, 2015). Physicians may no longer feel empowered to document their findings independently (Fernández-Alemán, Señor, Lozoya, & Toval, 2013; Weiner, Yeh, & Blumenthal, 2013). Physicians also believe there is an inherent threat to privacy and security as well as breach of doctor-patient confidentiality (Denham et al., 2013; Fernández-Alemán et al., 2013; Institute of Medicine, 2012). If medical information is freely available, this information may be manipulated and used against the providers by the patient, lawyers and healthcare funders (Fernández-Alemán et al., 2013). Failure to address the issue of information security and privacy may result in physicians deliberately under-reporting in their documentation, which, in turn, could lead to information paucity and inaccuracy. Indeed, cooperation with other healthcare professionals needs to be adequately organized so that it does not conflict with the autonomy that most health professionals are used to.

Training and IT skills. Some researchers identified the training and the competencies of health professionals as the end-users operating a particular application as key factors in HIT adoption (Adeleke, Lawal, Adio, & Adebisi, 2014; Graham-Jones et al., 2012; Restuccia, Cohen, Horwitt, & Shwartz, 2012). Graham-Jones et al. (2012) recommended incorporating HIT into the education and professional development of physicians since HIT is becoming integral to the practice of medicine. In most countries, the current medical education and professional development curricula do not

systematically prepare doctors to use HIT (Adeleke et al., 2014; Graham-Jones et al., 2012). Current and future physicians must master the minimum competencies required to use HIT if the healthcare system is to reach its quality and cost containment goals (Graham-Jones et al., 2012; Restuccia et al., 2012). Such an approach will ensure that the potential HIT users are equipped and prepared to face challenges associated with HIT implementation (Abdekhoda et al., 2015).

Cost and lack of resources. Researchers have identified the amount of capital needed and the costs of hardware and infrastructure as the top two barriers to HIT use particularly in developing countries (Ahlan & Ahmad, 2015; Ajami & BagheriTadi, 2013; Filipova, 2013; Hassibian, 2013). Organizations incur costs in acquiring software licenses; in training personnel; in installing and procuring computer hardware; in staffing IT positions; in upgrading systems; and in short-term reduction in productivity due to learning effects, and short-term loss of revenue due to billing (Gardner, Boyer, & Gray, 2015). Most healthcare organizations in developing countries are unable to bear these costs without donor funding. Physicians who perceive financial incentives would be helpful, or who prefer viewing patient health information electronically, are more likely to express interest in using HIT for their clinical work (Patel, Jamoom, Hsiao, Furukawa, & Buntin, 2013; Sezgin & Yildirim, 2014).

Organizational factors. Organizational factors play a critical role in the successful adoption of HIT (Cresswell & Sheik, 2013; Novak, Anders, Gadd, & Lorenzi, 2012; Zinszer et al., 2013). Zinszer et al. (2013) identified the following barriers to HIT adoption: lack of national vision and leadership, insufficient investment, and poor

conceptualization of the priority areas for implementing HIT. The application of HIT should focus on automating core processes and identifying innovative applications of HIT to advance public health outcomes (Sun & Qu, 2014; Vest & Issel, 2014; Zinszer et al., 2013).

Proper project planning and on-going critical evaluation of progress are central to successful implementation of major HIT projects due to the complex nature of healthcare systems (Cresswell, Bates, & Sheikh, 2013; Igira, 2012; Novak, Holden, Anders, Hong, & Karsh, 2013). According to Cresswell et al. (2013), taking a lifecycle perspective on the implementation of technological systems may help organizations avoid some of the commonly encountered pitfalls and improve the likelihood of successful implementation and adoption.

Overcoming HIT Adoption Barriers

The barriers. While users' resistance has been singled out as the most significant obstacle to successful technology adoption (Selander & Henfridsson, 2012; Ubel & Asch, 2015), a varied range of other reasons exist. Infrastructural challenges, lack of funding, technological incompetence, legal barriers, and social stereotyping have all been identified as barriers (Ajami & BagheriTadi, 2013; Anwar et al., 2012; Ben-Assuli, 2015; Qureshi et al., 2013). The barriers to adoption take the same shape irrespective of whether they occur in a developed or non-developed country, but the magnitude of the impact is different (Khalifa, 2013; Palvia et. al., 2012). In many developing countries, the costs of technology systems, in addition to the lack of technical expertise and the lack of

facilities for data processing, are the key issues to be addressed prior to implementation of HIT (Ahlan & Ahmad, 2015; Khalifa, 2013).

Understanding the challenges. Hassibian (2013) noted that developing countries must not only be fully aware of challenges and barriers in their way towards HIT but also study the experiences of countries that are successful in acceptance and implementation of HIT. Establishing a framework is key for developing countries to provide the necessary infrastructure for successful implementation of HIT (Ahlan & Ahmad, 2015; Bedeley & Palvia, 2014; Gardner et al., 2015; Hassibian, 2013). HIT use requires the presence of certain user and system attributes, support from all stakeholders, and numerous organizational and environmental facilitators (Ajami & BagheriTadi, 2013; Yusif & Jeffrey, 2014). In addition, the difficulty of using HITs and the non-use of specific functions result from the presence of barriers (Ajami & BagheriTadi, 2013). For the EHR systems to have a positive impact on patient safety, clinicians must be able to access these records effectively (Ajami & BagheriTadi, 2013; Smith et al., 2014).

Design and technical concerns. Gagnon, Nsangou, Payne-Gagnon, Grenier, and Sicotte, (2014) reported that design and technical concerns, interoperability, the relevance of the data, attitudes towards e-prescribing, productivity, and available resources are important factors to the implementation of e-prescribing for the users. Implementation strategies should focus on these factors to facilitate the adoption of HIT (Gagnon et al., 2014). It is interesting to note that some factors can be perceived as barriers or as facilitators depending on the implementation phase of e-prescribing, and these factors can change in nature (i.e., changing to a barrier or a facilitator) during the process of

implementation (Kruse et al., 2014). Granlien and Hertzum (2012) identified failure to define the barriers to HIT adoption clearly as a leading obstacle. Using social cognitive and adult learning theories, McAlearney, Robbins, Kowalczyk, Chisolm, and Song (2012) explored themes related to EHR implementation training. In their analysis, McAlearney et al. (2012) suggested that effective training programs must move beyond technical approaches and incorporate social and cultural factors to make a difference in implementation success.

Organizational readiness. Hameed, Counsell, and Swift (2012b), in a study of relationships between organizational characteristics and IT adoption, found organizational readiness to be the most significant attribute and also found a moderately significant association between IT adoption and IT department size. Hameed et al. (2012b) observed that innovation stage, innovation type, type of organization, and size of the organization affected the relationship between the organizational variables and IT adoption as moderating factors. Mitchell, Gagné, Beaudry, and Dyer (2012) explored how perceived organizational support and distributive justice affected employee reactions to new IT systems from a motivational point of view. Their findings indicated a positive association between perceived organizational support and distributive justice with intrinsic and identified motivation to use IT. Both intrinsic and extrinsic motivation influenced IT usage, but IT usage was associated with enjoyment and acceptance only when people were intrinsically motivated (Mitchell et al., 2012). Mitchell et al. (2012) recommended examination of employees' motives for using an IT rather than simply

categorizing the IT participation as voluntary or mandatory. Such an approach has the effect of improving acceptance.

Culture and leadership. In an investigation of the impact of organizational culture and leadership in the management of change within the context of a technology company, Yildirim and Birinci (2013) noted transformational culture and transformational leadership as critical strengths for achieving the desired business performance during major organizational changes such as mergers and acquisitions. Transformational culture together with the transformational leadership competencies can become advantageous during major organizational changes (Yildrin & Birinci, 2013). Culture and leadership are necessary factors for the successful performance of any organizational-driven change, including IT implementation (Ingebrigtsen et al., 2014).

The role of vendors and developers. Developers and suppliers should not market HIT as a panacea for all healthcare challenges but, rather, as a solution that empowers physicians to make better and improved healthcare decisions (Palvia, Jacks, & Brown, 2015). Vendors should present HIT solutions as the bridge that has been missing between consumers and providers and should portray HIT as a means of empowering consumers in the healthcare delivery process. Vendors should address all concerns of security, privacy, and confidentiality when presenting HIT solutions to both providers and consumers.

Selling point. To managers and healthcare leaders, HIT should be portrayed not as the solution that brings about that much needed competitive advantage (Khaifa, 2013) but as a tool with which organizations can create sustainable development. To the general

user, HIT should provide a basis for why one should feel comfortable to come to work the next day and to remain at work after it is time to go home. It should present an enjoyable working environment without extra effort but providing maximum returns. However, when selling the idea of current technology solutions, overpromising should be avoided while naive optimism can create pockets of resistance even before implementation. The bottom line is healthcare is a complex area constantly changing and with many very demanding, differently trained players. Neglecting to involve all the players from the outset is the surest recipe for failed HIT implementation, and it is for this reason that many HIT projects the world over have been technological disasters.

Relevance to the study. The purpose of this study was to explore the HIT implementation strategies used by healthcare leaders in Zimbabwe, a developing country. I analyzed the findings of the study through the lens of the TAM and its modifications with the intention of proffering solutions on how leaders in developing countries can successfully implement HIT. While the purpose of this paper was not to develop a new model of technology acceptance in healthcare, I desired to get a deeper understanding of the barriers and challenges to HIT implementation. Getting an in-depth understanding of how a few organizations have successfully implemented HIT will go a long way toward providing a framework on which other organizations in the healthcare sector can base successful HIT projects (Rupere & Takavarasha, 2013). This study was intended to open up debate on the applicability of the current technology acceptance models and on HIT systems as a one-size-fits-all solution for both developed and developing nations. Finally,

in this study, I have attempted to unravel the many areas of potential future research with a particular focus on technology acceptance in healthcare systems in developing nations.

Transition and Summary

In Section 1, I presented the background of the study before focusing on the problem and purpose statements. I then articulated the central research question and interview questions before providing an in-depth description of the nature of the study. After the nature of study came an introduction to the conceptual framework, through which lens I will analyze the findings of this study. Next was an analysis of the significance of the study focusing on both the contribution to the business practice and social change. A review of academic and professional literature then followed. The review included a comprehensive analysis of the extant literature on the role of information technology in healthcare with in-depth analysis of adoption barriers and challenges in addition to the many perceived benefits of HIT. A detailed review of the technology acceptance model then followed that analyzed many other previous technology acceptance models and focused mainly on healthcare. The review highlighted both the positives and negatives of the models and why and how healthcare as a CAS requires a unique approach to technology acceptance. Section 2 addresses the purpose statement, the role of the researcher, participants, the research method and design and provides an overview of Section 3.

Section 2: The Project

The purpose of this study was to explore the strategies that healthcare leaders in Zimbabwe use to implement IT. This section addresses the purpose statement, the role of the researcher, participants, research method, data collection and analysis, and the reliability and validity of the study.

Purpose Statement

In this qualitative multi-case study, I explored HIT implementation strategies used by Zimbabwean healthcare leaders. The targeted population included healthcare leaders and end-users from three Zimbabwean hospitals that had successfully implemented HIT. The findings from this study might contribute to business practices by providing a compilation of HIT implementation strategies that healthcare leaders in developing countries need if they are to improve productivity and operational efficiency. The results of this study could positively affect social change by providing leaders with knowledge and skills to use IT strategies to ensure delivery of quality, accessible, and affordable healthcare while creating employment for communities.

Role of the Researcher

The primary function of the researcher for a qualitative study involves data collection, data organization, and analysis of the results (Chenail, 2011). Leedy and Ormrod (2013) noted that a researcher performing qualitative research assumes the role of a data collection instrument. Denzin and Lincoln (2011) posited that a researcher must be able, through interviews, documents review, and observations, to collect data that are both reliable and valid. I used an exploratory multi-case study design to interact and

collaborate with participants through semistructured face-to-face interviews and collected secondary data from company documents.

As a hospital manager for the past 15 years and a resident of Zimbabwe, I was familiar with the healthcare system and progress with HIT implementation in Zimbabwean healthcare. My experience was beneficial to the research study because work experience that is similar to the research topic serves to enrich the content of the study. I identified the study population, obtained approval from each participant, and communicated with each participant throughout the study.

To preserve the stated intentions and the purpose of the study, a researcher must always maintain ethical standards (Miles & Huberman, 1994). Each interview participant received and signed a consent form giving confirmation of their willingness to participate in the study. I also adhered to the protocols of the Belmont Report (1979), to maintain ethical standards throughout the study (Miles, Huberman, & Saldaña, 2014). Before conducting the study, I sought the approval of the Walden University Institutional Review Board (IRB). The approval number for this study is 02-11-16-0389686.

Research bias, particularly in data analysis, can emanate from a researcher's experiences, personal values, and perspectives (Bernard, 2013; Sangasubana, 2011). A researcher who recognizes personal views is better placed to understand and appreciate interpretations from other people (Marshall & Rossman, 2016). Through member checking (Harper & Cole, 2012; Harvey, 2015), I ensured that participants' observations and experiences formed the basis for the interpretation of the study findings. The process of member checking involves sharing the researcher's interpretations of the interview

with the participant for validation (Marshall & Rossman, 2016). Using follow-up member checking interviews, one can obtain comprehensive data and reach data saturation (Andraski, Chandler, Powell, Humes & Wakefield, 2014; Walker, 2012). I wrote accounts of my feelings as the project's researcher during the data collection process; these accounts helped me identify any personal biases that could affect interpretations. The researcher's ability to mitigate bias and validate the correct interpretation of the phenomenon determines the data quality in a study (Rubin & Rubin, 2012).

Prior to interviewing participants, I built trust with them by communicating openly and honestly so they could make informed decisions regarding their participation. To enhance each interview session, I applied an interview protocol identically to all the research participants. The use of the protocol ensured that I asked the same open-ended questions, in the same order, to each participant, and used bracketing both to mitigate any preconceptions in the research process and to add intellectual rigor to the study.

Participants

A purposive, criterion-oriented sample was composed of healthcare leaders and end-users selected from healthcare organizations in Zimbabwe that have successfully adopted and implemented HIT. Sampling in qualitative research usually focuses on a small number of interviewees and relies on in-depth, detailed responses to obtain pertinent lived experiences (Marshall & Rossman, 2016; Yin, 2014). Only individuals from institutions that had successfully implemented HIT in Zimbabwe were eligible to participate in this study. The participants had to have had some experience in HIT

adoption and use. Among them were chief executive officers, information technology directors, managing directors, physicians, hospital managers, and nurses.

After obtaining IRB approval, I screened potential participants based on the selection criteria. I used purposive sampling to select participants from healthcare institutions that had successfully implemented HIT programs. Purposive sampling permits selection of participants most likely to provide information relevant to the study purpose (Suri, 2011). Access to participants was through the recommendations from the human resources managers of the designated institutions. I also used, where available, company websites to extract contact details of the prospective participants. Recruitment of participants was through an invitation letter, which I delivered in person or via email. The invitation letter (Appendix E) clearly spelled out the details and focus of the study as well as the voluntary nature of participation and the freedom to withdraw at any given time.

It is important to establish a working relationship with participants for qualitative research to be successful (Swauger, 2011). Swauger (2011) recommended researchers should utilize consistent communication to connect with participants as well as maintain principles of the investigator's responsibility to the participants. Once a prospective participant agreed to participate in the study, I intentionally and consistently used phone calls and email communication as means of establishing a working relationship. My experience as a healthcare manager helped foster shared working relationships with the participants, made them more comfortable and willing to speak openly, and allowed them to be honest with responses.

Research Method and Design

Since the object of this study was to explore HIT implementation strategies through in-depth interviews rather than statistically explain causal relationships, the qualitative method was most appropriate. The qualitative method is appropriate when the research purpose is to explore business processes or to investigate how people make sense of and bring meaning to their lived experiences (Yin, 2011). Specifically, I chose the multi-case study design for this study. A multi-case study design supports the exploration and descrition of a particular phenomenon within a particular, contemporary context (Yin, 2014).

Research Method

The options for research methods are quantitative, qualitative, and mixed method. The research problem guides the choice of research method and design for the study. In this study, I employed qualitative research method to explore the strategies used by healthcare leaders in Zimbabwe to implement HIT. Qualitative researchers are concerned with developing explanations of social phenomena and aim to understand the world in which we live and why things are what they are (Denzin & Lincoln, 2011; Morse, 1994). Qualitative research's focus is on the social aspects of the world and on answering questions about why people behave the way they do and how they develop opinions and attitudes (Bluhm, Harman, Lee, & Mitchell, 2011). To adequately answer the research question, I needed a deep understanding of the phenomenon through in-depth interviews and open-ended questioning, hence the use of a qualitative approach.

Quantitative research centers on the application of mathematical logic to phenomena with the goal of testing a theory or examining causal relationships (Rubin & Rubin, 2012). This study's objective, of exploring the strategies healthcare leaders in Zimbabwe use to implement IT, did not require the quantification and analysis of factors. Mixed methods research involves the use of both quantitative and qualitative methods to study a phenomenon (Denzin & Lincoln, 2011). The mixed method is most useful when one method does not provide a complete understanding of the study topic. In this study, the qualitative method adequately addressed the research question. Accordingly, I did not select a quantitative or a mixed methods research approach for the study.

Research Design

Qualitative case study methodology provides tools for researchers to study complex phenomena within their contexts (Baxter & Jack, 2008; Tsang, 2013). Case study design supports the exploration of a particular phenomenon and enables the investigation and description of that phenomenon within a particular, contemporary context (Tsang, 2013; Yin, 2014). Thus, a case study design supported the conduct of the study to explore IT implementation strategies used by healthcare leaders. According to Stake (2010), in case studies researchers endeavor to characterize phenomena described by study participants and interpret data collected from multiple sources to construct descriptions of phenomena. Accordingly, I used a multi-case study design to explore the strategies healthcare leaders in Zimbabwe use to implement IT.

Other qualitative research designs did not support the rich case exploration and description that was desired for the study. Application of a phenomenological design

would permit data collection primarily from the conduct of interviews (Marshall & Rossman, 2016), but would not allow for the gathering of information from other available sources. Ethnographic study designs are appropriate for the examination of the beliefs and behaviors of culture-sharing groups (Marshall & Rossman, 2016), which was not the focus of this study. Grounded theory study design centers on developing or unearthing a fundamental theory (Rubin & Rubin, 2012) and would not support the study objective of in-depth case exploration and analysis.

Population and Sampling

The population for the study consisted of healthcare leaders and end-users from three hospitals in Zimbabwe who had experience in adoption and implementation of HIT. The objective of this study was to explore strategies used by healthcare leaders in the implementation of HIT using data from documents, observations, and interviews with participants with specific knowledge of HIT adoption and implementation. Eligible participants were individuals (i.e. leaders or end-users) with experience in HIT adoption and use from healthcare institutions in Zimbabwe that had successfully implemented HIT. Persons who did not meet all of these parameters were not eligible to participate in the study. Accordingly, I employed purposive sampling to recruit participants with relevant knowledge and experience. Purposive sampling allows selection of participants who are most likely to provide data required for meaningful understanding of phenomena (Poulis, Poulis, & Plakoyiannaki, 2013).

Initially, I employed homogeneous sampling (as opposed to maximum variation sampling) to identify and recruit study participants. In homogeneous sampling, a

researcher purposively selects participants, from a range of groups, who have similar characteristics to ensure the exploration of a multiplicity of perspectives regarding the phenomenon of interest (Marshall & Rossman, 2016). I used snowball sampling as a mechanism for identifying and recruiting the additional study participants. Snowball sampling is a form of network sampling that facilitates identifying respondents within difficult to recruit or elite populations (Bernard, 2013).

I determined an appropriate sample size for the study in line with the number of participant sites (i.e., hospitals that have successfully implemented HIT in Zimbabwe) and the required number of interviewees per site. A large sample is not necessary to achieve balance and thoroughness during the conduct of a qualitative case study (Dworkin, 2012; Marshall, Cardon, Poddar, & Fontenot, 2013; Rubin & Rubin, 2012). Two to three participants per subsample area are sufficient to ensure the achievement of a suitable depth and diversity of perspectives in qualitative research (Rubin & Rubin, 2012; Yin, 2014). I interviewed 10 participants from three participating hospitals in Zimbabwe, with two of the hospitals contributing three participants each, and four from the other hospital.

Prior to conducting interviews, I allowed participants to determine the location of the interview that was most suitable to their circumstances. This strategy allowed for open and honest communication and responses to the interview questions (Covell, Sidani, & Ritchie, 2012; Doody & Noonan, 2013). I conducted face-to-face interviews at the interviewee's convenience and provided an option for phone call interviews for those who could not accommodate face-to-face interviews. Face-to-face interviews provide an

opportunity for the researcher to observe facial expressions and mannerisms of the interviewee; these observations are not possible over the phone or through email (Block & Erskine, 2012; Irvine, Drew, & Sainsbury, 2013). The best interview setting is one that will minimize interruptions while also ensuring that the participant feels comfortable and is not intimidated (Jacob & Furgerson, 2012). Each face-to-face interview, consisting of ten open-ended questions, lasted between 30 and 60 minutes.

I achieved saturation by interviewing additional participants, identified through snowball sampling. Researchers using purposive sampling to find and recruit study participants can use small sample sizes (Bernard, 2013). O'Reilly and Parker (2013) observed that sample population adequacy for a qualitative study is a function of the study topic, participant availability, and sufficiency of sample size for permitting the examination of study research questions.

Ethical Research

Researchers have an ethical duty to protect study participants from harm, safeguard their confidentiality, and obtain their informed consent before they participate in the study (Knepp, 2014; Yin, 2014). Prospective study participants confirmed their willingness to participate in the study by signing the consent form and had an opportunity to ask questions regarding the study requirements. In the consent form (Appendix A), I explained the: (a) contact information, (b) sponsoring institution, (c) study purpose, (d) anticipated risks, (e) voluntary nature of the study, and (e) freedom to withdraw from the study at any time. I provided the participants with the consent form and collected it from them after signing. Participation in the study was voluntary, and participants could

withdraw from the study at any time without giving an explanation. Participants did not receive any monetary or any other incentive.

Ethical researchers protect participant rights, gain the trust of participants, protect them from potential harm, protect against impropriety, and guarantee the research integrity of the project (Marshall & Rossman, 2016; Rowley, 2012). I completed the National Institutes of Health Office of Extramural Research training program and received the certification required to engage in research involving human subjects (Appendix D). Once I received approval from Walden University IRB, I sent an invitation letter (Appendix E) via e-mail to all potential participants introducing myself and explaining the purpose of the study. Upon generating interest from a potential participant, I emailed that individual a consent form (Appendix A), which the participant had to complete before data collection could begin. I will keep data and information from the study secure on a password-protected external hard drive and in a locked storage cabinet for no less than five years after completion of the study; after this time, I will destroy the information and data linking participants to the study. To ensure privacy and confidentiality, the identities of participants will remain confidential forever; names and identities of participants are referenced as Participant 1, Participant 2, and so forth in the narrative.

Data Collection

When conducting qualitative case studies, researchers often use interviews as one of the main methods for data collection (Yin, 2014). In this study, interviews were the main means of gathering data, augmented by data from company documents and

observations in situ to ensure methodological triangulation (Denzin, 2012). Company documents included policy documents, standard operating procedures (SOPs), as well as technology implementation guidelines where available. Observation is a systematic data collection approach that involves researchers using all of their senses to examine people in natural settings or naturally occurring situations (Denzin & Lincoln, 2011). I observed participants' mannerisms at their workplaces and as they responded to the interview questions. The purpose of methodological triangulation is to add depth to the analysis of the data collected (Fusch & Ness, 2015; Heale & Forbes, 2013). Before commencing data collection, I obtained IRB approval and permission from the selected healthcare institutions in Zimbabwe (Appendix G). I then obtained informed consent from all prospective participants before the process of data collection could begin.

Instruments

In qualitative studies, the researcher is the primary data collection instrument (Yin, 2014). As the primary data collection instrument, I collected data using a semistructured interview guide (Appendix B) consisting of 10 open-ended questions covering participants' experiences and perceptions of HIT implementation strategies, in line with the interview protocol (Appendix C). Data from company documents and observations complemented the interviews in line with Yin's (2014) recommendation of triangulating data from multiple sources to ensure research reliability. Company documents included policy documents, SOPs, as well as technology implementation guidelines. I used an observational protocol (Appendix F) to observe participants' mannerisms as they responded to the interview questions, workplace surroundings, as

well as activity and emotional/affective atmosphere within the work environment. The objective of using this approach was to understand the strategies healthcare executives used to implement HIT in organizations.

Following IRB approval, I emailed a document with details of the proposed study and the consent form to all potential participants. Those who agreed to participate signed the informed consent form that I collected in person from each willing participant. I scheduled interviews for a time, date, and location mutually agreed upon with each consenting participant. A semistructured interview protocol consisting of 10 open-ended questions formed the basis of the interview process. The use of the interview protocol ensured that participants provided answers to the same issues in a similar order (Jacob & Furgerson, 2012). Each interview lasted 30-60 minutes. Participants in the study described their experiences with HIT implementation strategies.

Three senior administrators participated in a pilot study to test the appropriateness and reliability of the interview questions and protocol before I conducted the interviews with the study participants. The process of member-checking (i.e., respondent validation by sharing the findings and responses with the participants) and the pilot study helped in enhancing the validity of the study (Harper & Cole, 2012).

Data Collection Technique

I scheduled interviews lasting 30-60 minutes for a time, date, and location mutually agreed upon with the participant. The interview format was in the form of semistructured questions following an interview protocol (Denzin & Lincoln, 2011; Jacob & Furgerson, 2012; Yin, 2014). Semistructured interviews allowed participants to

provide depth in their responses. The use of the interview protocol ensured that I ask the same questions in a similar order to all participants (Peredaryenko & Krauss, 2013). Data from company documents and observations using an observational protocol (Appendix F) augmented the interview data. Company documents included policy documents, SOPs, and technology implementation guidelines if available. Case study research allows for the collection of data from several data sources such as interviews, archival documents, and a researcher's observations (Yin, 2014). With the consent of the participant, I audio-recorded all interviews in addition to taking notes on the nonverbal expressions and key comments during each interview.

I used an interview protocol and ensured that participants provided answers to one question at a time and in the same order for all participants. Maintaining a neutral manner and expression when asking questions or taking notes is an integral and essential part of the interview protocol (Denzin & Lincoln, 2011). While detailed answers are essential, keeping track of time and remaining in control of the interview process helps avoid redundancy and enhances efficiency (Doody & Noonan, 2013). The use of the case study protocol ensured that I remained in control of the interview process.

I began the pilot study only after receiving approval from Walden University's IRB. Three senior administrators who work in a hospital setting participated in a pilot study. The pilot study ensured the questions were practicable, easy to understand, and revealed relevant data for this study (Harper & Cole, 2012). After the pilot study, I discussed each question with the pilot study participants to determine ease of understanding, clarity, and relevance to the study's purpose.

Following the feedback from the pilot study's participants, I commenced data collection. The first step was to contact potential study participants in person, via email, or over the phone. Personal introduction and detailed explanation of the purpose of the study were next, followed by the presentation of the informed consent form to willing participants. Follow-ups clarifying any questions about participation ensured that the potential participants clearly understood the study's purpose. I retrieved the signed informed consent forms indicating the study participants' voluntary agreement to participate in the study before scheduling interviews at a place of their choice. At the beginning of each interview, I reiterated study participants' rights, including the right to withdraw at any time, as contained in the informed consent. I then proceeded with data collection using face-to-face and telephone interviews.

I audio recorded all interviews with the participants' consent before transcribing the interviews verbatim at the end of each interview. Audio recording the interviews allows for thorough analysis of the responses of participants and the ability to quote statements verbatim when required (Rubin & Rubin, 2012). After transcribing the interviews, I sent copies of the transcripts and interview interpretations to the participants for transcript review, member checking, and verification before commencing data analysis. Member checking is a technique researchers use to enhance the credibility and trustworthiness of a research project's data (Elo et al., 2014; Harper & Cole, 2012) and the accuracy of interpreted meanings through participant review and feedback (Boesch, Schwaninger, Weber, & Scholz, 2013.

Data Organization Techniques

A researcher can achieve confidentiality by assigning generic codes to each participant (Gibson, Benson, & Brand, 2013). For this study, I used alphanumeric codes to mask the identities of the participants. Through the informed consent process, I obtained permission to audio record the interviews. After the interviews, I transcribed the recorded interviews verbatim into written documents, which I kept in individual folders for each participant on a password protected hard drive as recommended by Jacob and Furgerson (2012). I used the NVivo 11 software to input and store data for coding and exploring themes while maintaining the confidentiality of research participants. I stored all data on a password-protected external hard drive that I will keep locked in a cabinet for five years.

Data Analysis Technique

Qualitative researchers ask open-ended interview questions to collect data and explore meanings for a study (Wilson, 2012). Through the establishment of an interview protocol, I asked each participant the interview questions listed in Appendix B. Apart from face-to-face interviews, I used other data sources such as company documents and my observations to achieve methodological triangulation. Triangulation is the use of multiple methods of data collection to interpret a phenomenon (Bekhet & Zauszniewski, 2012; Denzin, 2012; Jamshed, 2014; Marshall & Rossman, 2016) and ensures that data are rich and in-depth (Fusch & Ness, 2015). Documents included policies, SOPs, and guidelines while observation involved prolonged scrutiny of participants in their work environments and their mannerisms during the interview process using an observational

protocol. In qualitative research, the object of data analysis is to uncover themes that answer a central research question (Yin, 2014). In this case study, data analysis provided a framework to understand the strategies used by healthcare leaders in Zimbabwe to implement HIT. Data analysis involves working through collected data to discover meaningful themes, patterns, and descriptions that answer the central research question of the study (Yin, 2012).

Data analysis followed the method described by Yin (2011), which involved (a) compiling the data, (b) disassembling the data, (c) reassembling the data, (d) interpreting the data, and (e) making conclusions. I achieved the above goals using Nvivo 11, a software package that helps with qualitative data analysis. Nvivo eliminates laborious tasks such as forming codebooks and sorting and arranging of data; further, the program easily links interview documents together, so a theme can be traced through different interview responses (Bazeley & Jackson, 2013). The use of Nvivo increases the rigor in qualitative research and assists in aligning the collected data with previous literature (Bazeley & Jackson, 2013).

After organizing data into themes, my next step was interpreting the meaning of the data (Yin, 2011). Interpreting the data involves the researcher giving meaning to the data. The final step in data analysis was the conclusion. Conclusions pertain to developing a sequence of statements that organize the data analysis around the project's central question (Yin, 2011). Concluding themes and patterns derived from the central research question are fundamental to understanding the findings of a qualitative research study. I analyzed data through the lens of Davis's (1986) technology acceptance model

(TAM). The use of this framework assisted in interpreting the meaning of data collected. By examining HIT implementation strategies through the lens of Davis's (1986) TAM, I compared the data collected with an established model relevant to the phenomenon.

Reliability and Validity

The discussion in this subsection includes information about the reliability of the instruments and processes referenced in this study. The second topic in this subsection is the identification of internal and external threats to the validity of the study. I will review the controls and strategies used to mitigate the threats and to ensure the integrity of the study results. Researchers use the following criteria proposed by Lincoln and Guba (1985) to assess the rigor of qualitative research: dependability, credibility, confirmability, and transferability.

Dependability refers to how reliable the data are and is often compared to the concept of reliability in quantitative research (Elo et al., 2014). Credibility refers to whether the findings are accurate and trustworthy from the perspectives of the researcher, the participants, and the reader (Lincoln & Guba, 1985). According to Cope (2014), credibility is the truth inherent in the data and enhanced by the accuracy of the researcher's confirmed interpretation. Transferability refers to speculations on the possible applicability of findings to other situations under similar, but not identical, conditions (Bloomberg & Volpe, 2012). Confirmability is a criterion for assessing the accuracy and reasonableness of the findings obtained from the data and observation of the participants (Houghton, Casey, Shaw, & Murphy, 2013).

Reliability

Reliability refers to the extent that research findings are replicable in other similar studies (Bloomberg & Volpe, 2012; Street & Ward, 2012). Rather than focusing on reliability, qualitative researchers demonstrate the trustworthiness of research through dependability (Bloomberg & Volpe, 2012; Denzin, 2012; Elo et al., 2014). Dependability is critical during the study design phase, and qualitative researchers include mechanisms for ensuring dependability in the design of studies to ensure the integrity of collected data and findings (Cope, 2014; Marshall & Rossman, 2016). Researchers can use case study protocols and case study databases to demonstrate case study dependability (Jacob & Furgerson, 2012; Yin, 2011).

To ensure the dependability of study findings, I developed and adhered to a case study protocol. Cronin (2014) affirmed the significance of a case study protocol in qualitative case studies. I used NVivo 11 software to create and maintain a case study database for the study of strategies used by healthcare leaders in the implementation of HIT in Zimbabwe. Use of the case study database enhances study dependability by providing other investigators with insight into the data products and analytical methods used to derive study findings and conclusions (Chenail, 2011). Member checking to verify correct interpretations of participants' experience also enhanced dependability.

Validity

Quantitative researchers focus on internal and external validity as measures of research quality. Qualitative researchers, on the other hand, implement measures that ensure credibility and transferability to safeguard the integrity of their research (Marshall

& Rossman, 2016). Credibility is the truth inherent in the data and enhanced by the accuracy of the researcher's confirmed interpretation (Cope, 2014). I used (a) data triangulation, (b) the assessment of rival explanations, (c) researcher bias identification, and (d) member checking to safeguard the study's credibility.

Researchers also use document reviews, interviews, and direct observations to achieve study credibility and enhance the quality of case studies (Roy, Zvonkovic, Goldberg, Sharp, & LaRossa, 2015). Likewise, the use of methodological triangulation of findings from data collected from observations, documents review, and interview questions augmented the quality of the study. The gathering of study data across multiple sites also ensured spatial variability in the study and supported the broad exploration of strategies used in the implementation of HIT.

In qualitative research, credibility is the corollary to internal validity (Bloomberg & Volpe, 2012; Denzin, 2012). Yin (2014) argued that credibility is primarily a concern for explanatory case studies only. In this study, I enhanced credibility by the assessment of rival explanations as recommended by Yin. Rival explanations for phenomena do not undermine case study designs or procedures but do pose a challenge to interpreting a study's findings and formulating a study's conclusions (Yin, 2014). A single conceptual framework—the technology acceptance model (Davis, 1986)—supported the collection and analysis of study data. I explored alternative conceptual frameworks during the data analysis process and examined the suitability of these theories as a framework for study findings. The examination and refutation of rival theories during the data analysis process enhanced the credibility of the study's results and conclusions.

I employed researcher bias identification as a second strategy for ensuring the credibility of the case study. The researcher's theories, personal values, or preconceptions might influence the structuring and conduct of the intended study (Chenail, 2011; Yin, 2012). The self-awareness of personal and professional beliefs and responsibilities as a researcher (i.e. bracketing) will decrease the likelihood of interspersing bias in data collection and data analysis (Tufford & Newman, 2012). Chenail (2011) argued that researchers must engage in self-reflection prior to the conduct of qualitative studies to identify and articulate attitudes about the research topics that may influence the collection and analysis of data. I conducted a personal assessment of biases before initiating data collection for the study of strategies used by healthcare leaders in HIT implementation.

I used member checking as a third technique for establishing the credibility of this qualitative case study. Member checking is a process by which researchers share draft interpretations with participants in person or over the phone so that the participants may comment on the accuracy of the materials (Harper & Cole, 2012; Houghton et al., 2013; Marshall & Rossman, 2016). Study participants received a draft interpretation of interview responses and had the opportunity to evaluate the draft for accuracy and completeness and make corrections as necessary. Feedback from participants helped enhance the accuracy and credibility of the study process (Harper & Cole, 2012).

Rather than focusing on the external validity of study findings, researchers in qualitative research are concerned with the transferability of the findings (Denzin, 2012). Although generalizability was not the intended goal of this study, I addressed the issue of transferability. Transferability refers to whether and to what extent a phenomenon in a

particular context applies to another context (Bloomberg & Volpe, 2012; Lincoln & Guba, 1985). I addressed transferability through the thick and rich description of the study population and the context. The inclusion of this information will enable readers to evaluate the transferability of study findings and conclusions appropriately.

Confirmability in qualitative research resembles the concept of objectivity in quantitative research (Bloomberg & Volpe, 2012; Lincoln & Guba, 1985). Researchers use this criterion to assess the accuracy and reasonableness of the findings obtained from the data and observation of the participants (Houghton et al., 2013). The implication is that the study findings must be the result of the research and not merely reflections of the biases and subjectivity of the researcher (Bloomberg & Volpe, 2012). To achieve this end, a researcher needs to identify and uncover the decision trail for public judgment. In application, confirmability encompasses the corroboration of findings by other investigators (Petty, Thomson, & Stew, 2012; Reilly, 2013). Researchers use the following actions to achieve confirmability: (a) maintaining an audit trail of the research (Bloomberg & Volpe, 2012; Wahyuni, 2012), (b) using multiple data sources (Houghton et al., 2013), and (c) ensuring that the findings reflect the understandings and experiences of the participants rather than the researcher's preferences (Boesch et al., 2013). To achieve confirmability, I recorded all interview data, maintained an audit trail, and collected data from multiple data sources. I also used member checking so that findings reflected the understandings of the participants.

Data saturation occurs when no new themes, concepts or findings are evident in the data (Marshall et al., 2013; Morse, Lowery, & Steury, 2014; Roy et al., 2015;

Silverman, 2015). Saturation indicates that the data are sufficient for the researcher to conduct a comprehensive and credible analysis of the research phenomenon (Onwuegbuzie & Byers, 2014; O'Reilly & Parker, 2012). I achieved data saturation by employing criterion-oriented purposive sampling (Birchall, 2014; Robinson, 2013) and by interviewing the participants in incremental numbers until there was redundancy in data collected (Marshall et al., 2013). Methodological triangulation of data obtained from interviews, observations, and information gathered from company documents was the main strategy for achieving data saturation.

Transition and Summary

The purpose of this qualitative exploratory case study using Yin's (2011) analysis process was to understand strategies that healthcare leaders need to implement HIT. I used criterion-oriented purposive sampling to select healthcare leaders and end-users with HIT experience from three hospitals in Zimbabwe. I utilized semistructured, audiotaped interviews to collect data and explore the strategies and personal perceptions of the participants. I transcribed all the data verbatim before analysis using Nvivo 11 qualitative software to identify emerging themes and patterns within the study.

In Section 2, I discussed the purpose statement, the role of the researcher, the participants' demographics and the sample size, the research method and design, the data collection and analysis, and the reliability and validity of the data. Section 3 includes (a) the presentation of findings, (b) applications to professional practice, (c) implications for social change, (d) recommendations for action, and (e) future study. Finally, I will end Section 3 with a summary and conclusions.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this study was to explore the strategies that healthcare leaders in Zimbabwe use to implement HIT. The participants were healthcare leaders and end-users from three hospitals that have successfully implemented HIT in Zimbabwe. I used the NVivo software for initial coding and establishing themes, before writing findings based on identified key themes and quotations from participants.

Despite the widely acknowledged benefits of IT in healthcare, the adoption rate has remained low in developing countries. In this study, I explored strategies healthcare leaders in developing countries use to implement HIT. Implementation strategies, barriers to adoption, and user acceptance emerged as the themes most healthcare leaders associated with successful or failed HIT projects. Several other subthemes also emerged including: (a) the importance of stakeholder involvement, (b) the importance of management buy-in, and (c) the low level of IT literacy among healthcare workers.

In the following narrative, I will provide a detailed discussion of the study findings with reference to the overarching research question, the conceptual framework, and existing literature on HIT adoption and implementation. After that, I will articulate the application of the findings to professional practice, the implications of the study to social change, and proffer recommendations for action and further research. I will then end this section with personal reflections and a conclusion.

Presentation of the Findings

The overarching research question was: what strategies do healthcare leaders in Zimbabwe use to implement health information technology? I conducted this study to help healthcare leaders develop more sustainable strategies to successfully implement HIT, thereby benefitting from the process and systems efficiency that IT brings to business. Based on in-depth interviews and ancillary documents, the study consisted of identifying strategies healthcare leaders use to successfully implement HIT. I used a purposive sample of 10 healthcare leaders and end-users, from three hospitals in Zimbabwe that have successfully implemented HIT. Seven of the 10 participants were leaders while three were HIT end-users.

The participating health institutions, selected on the basis of having successfully implemented HIT, consisted of three private healthcare facilities. One of the health facilities, a medical center with both inpatient and outpatient facilities, owns healthcare facilities across the country and has successfully implemented an enterprise-wide health information system in all its units. It took the organization 5 years to successfully implement the system, due to numerous challenges encountered during the implementation process. The HIT system in this institution comes with a robust EHR module, a management information system (MIS), and an integrated accounting package. The users of the system include doctors, nurses, and administrative personnel. Management has access to information through the real time MIS functionality.

The other institution was a standalone, medium-sized hospital that prides itself on having developed and implemented its in-house health information system. The system

has a patient database and registration module as well as EHR functionality, and is available for use by the front office personnel, nurses, and doctors. According to the participants from the institution, the organization took about three years to develop the system, before going through two more years of implementation. Despite being a standalone facility, the organization faced funding and infrastructural challenges just like other healthcare institutions in the country. Participant observation in the organization revealed the state of the art technology that was in use, and user acceptance was at its highest level, with demonstrable management involvement. All the users appeared satisfied and fully engaged with using the HIT system.

The third case was a health institution that offers integrated radiology services and has multiple centers across the country. The institution successfully implemented HIT more than five years ago, and boasts of having technology that is compliant with internationally recognized standards such as the Digital Imaging and Communications in Medicine (DICOM) and Health Level Seven International (HL7). The institution has managed to maintain the highest level of HIT leadership in the country, specifically in the field of radiology. Participants from this organization, however, indicated that it was not an easy journey for the organization to achieve this status. The accomplishment required total commitment from management and staff as well as the participation of external stakeholders and consultants.

The three cases are a reflection of what the healthcare sector in Zimbabwe could achieve if healthcare leaders managed to overcome the numerous barriers to HIT implementation in the country. While several healthcare institutions have attempted to

implement HIT, most have abandoned the projects due to implementation challenges including funding and infrastructural challenges. Connectivity challenges and electricity instability remain the major infrastructural barriers to HIT implementation in the country. While there is some semblance of HIT adoption in the privately owned health institutions, hospitals in the public sector are lagging behind. Information technology use in public healthcare is mainly limited to national health information management systems, and there are no policy guidelines on the adoption of HIT by providers in the public sector. It is, however, encouraging that leaders from the cases in this study are currently engaging policy makers regarding the development of an HIT policy for the country. In this study, interviews with participants from the three organizations helped unravel some of the strategies used by healthcare leaders to successfully implement HIT.

The interviews were semistructured to ensure that the key issues of interest were covered with each participant while allowing the flexibility to probe for more details and enable the participants to contribute any other relevant information. I asked questions aimed at determining the strategies healthcare leaders use to implement HIT as well as the critical success factors. I had planned to interview 10-12 participants from three participating hospitals, with at least three participants per site. Ten interviews were completed, and the questions proved to be straightforward and understandable to the participants; therefore, I was assured of the alignment of the study and research instrument with experiences of the healthcare leaders and end-users.

After completion of the data collection, I transcribed the recorded interviews and imported the transcriptions into NVivo 11 for coding purposes. In coming up with the

initial coding schema (NVivo nodes), I used the key topics from the interview protocol. Using Nvivo 11, I coded relevant information from each transcribed interview to an appropriate node. It was necessary, as the coding progressed, to combine, modify or add nodes in line with the findings. The resulting dataset comprised all extracted data from the interviews, organized by key themes and subthemes relevant to the main research questions of the study. Table 1 provides the initial coding schema based on the interview questions while Table 2 provides the resulting key themes and subthemes. In the following sections, I will describe the research findings derived from these themes with direct quotations from the interviews where necessary to illustrate the themes from the participants' personal perspectives.

Table 1

Initial Coding Schema based on Interview Questions

Theme Name (Node)	**Sources**	**References**
Implementation strategies used	10	189
User acceptance and resistance	10	168
Barriers to implementation	10	147
Benefits of adoption	10	93
Role of management	10	63
Critical success factors	10	60
Funding and infrastructural challenges	10	54
Stakeholder involvement	8	51
Different strategy	8	48
Change management	10	39
Privacy and confidentiality	8	18
Recommendations	8	18
Access rights	6	15
Level of computer literacy	2	6
Vendor selection	4	6

Table 2

Major Themes & Subthemes

Major themes	**Subthemes**
Implementation strategies used	Stakeholder involvement
	Organizational readiness/resources
	Change management issues
Barriers to HIT adoption	Funding challenges
	Infrastructural challenges
	Privacy and confidentiality issues
	Stakeholder resistance
Factors affecting user acceptance	Stakeholder involvement
	Perceived benefits
	Ease of use
	Computer literacy and training

Although participants came from three different hospitals with different business models, common themes were recognizable early on in the interviews. In all the interviews, participants emphasized the strategies used, the adoption barriers, and factors affecting user acceptance; I identified these as the major themes emerging from the study.

Theme 1: Implementation Strategies Used

Questions one, two, and three were directly related to the overarching research question, and it was from responses to these questions that Theme 1 emerged as the dominant theme. While participants were from different organizations, it was evident that implementation strategies cut across the organizational divide, as demonstrated in Table 3.

Table 3

Implementation Strategies Used

Response	**Respondents**	
	Number	**%**
User involvement in choice of system	10	100
Stakeholder training/computer literacy	10	100
Continuous stakeholder engagement	10	100
Adequate financial resources	10	100
Ease of use of system	10	100
Stakeholder awareness of benefits	10	100
Appointment of business champions	9	90
Project management approach	8	80
Standardization of system and processes	8	80
Link system to business model	7	70
IT policy and guidelines	7	70
In-house software development	7	70
Gap analysis	6	60
Process and workflow re-engineering	6	60
Use of consultants	6	60
Centralised data	6	60
Informed vendor selection and system choice	5	50
Benchmarking	5	50
Use of local partners	5	50
Solution mapping	4	40
Phased/modular approach	4	40
Hub-and-spoke model	3	30

All participants were eager to articulate the strategies used to implement HIT in healthcare organizations. Table 3 shows the range of the strategies that participants noted as having been used to implement HIT in participating organizations. All the participants (*n*=10) mentioned user involvement, computer literacy, training, stakeholder engagement on system benefits, user-friendly system, and adequate financial resources, as necessary

strategies for implementing HIT. Eighty percent of the participants indicated that they used a project management approach, with a focus on standardization. Nine out of ten of the participants (90%) mentioned the importance of business champions and key users with knowledge of the business and the IT system. Other notable strategies included gap analysis, solution mapping, linking system to business model and strategy, hub-and-spoke model, and the use of consultants.

Stakeholder involvement. Stakeholder involvement emerged as a dominant theme with all participants indicating that this was a critical success factor for HIT implementation. Participants noted stakeholder engagement as important during the whole HIT implementation process from solution mapping, training, and awareness to system selection as well as continued engagement during use. Participant 1 stated:

> One of the strategies that we did was first to involve the end users in coming up with the system. So it is an internationally sourced system coming from India. One of the things was that we went through a session of solution mapping where we identified the different workflows in every unit of the hospital including retail pharmacies and the nursing services. That input was put together to come with a system that can integrate all the different departments of the hospital. So one of them [strategies] was to involve the end users.

Similarly, Participant 2 added:

> Then there is the aspect of having the buy-in from all the people who will be using the system. You also notice that once people have a notion that the system is not proper, is not functioning well; you will have problems in implementing

> such as system. So there was stakeholder management and stakeholder involvement in the process [as strategies].

Participant 4 concurred:

> However, the fact that they [stakeholders] were involved, and they participated; they [leaders] were even patient in teaching them what a mouse is, that this is a keyboard [and so on]. I think that alone was an excellent strategy for everyone to appreciate though there was resistance initially.

Referring to people involvement Participant 5 had this to say:

> The most important strategy was to make people aware of the system through training. Also equipping them with technology literacy was a prerequisite. People involvement ensured that there was buy-in on the system from the beginning
> I think the people involvement was the most important critical success factor because many people were involved in the training, and this helped people accept the use of technology. User awareness through training and the involvement of key users were [was] important in overcoming or minimizing the barriers.

Adequate financial resources. There was a particular emphasis by participants on the need to have sufficient funds to ensure HIT implementation success. Participants 2, 3, 5, and 7 observed that project delays occurred due to lack of sufficient funds or poor planning. Participant 2 lamented, “On some occasions we had to stop the program simply because we had no money. For that reason, instead of the initial 12 months, we ended up getting to more than two years.” Participant 3 noted, “If only we had put in place a proper project budget, we would have completed the project on time. Unfortunately, due to

financial constraints, we had to have this overrun." Commenting on barriers faced during implementation, Participant 7 explained:

> One of the barriers we faced was funding. When we started, we thought we had enough money for the project only to realize that this was far from enough in the middle [of the project]. We had terribly underestimated the project cost. Hardware was expensive; consultancy expenses were not captured, and considering that we needed to go enterprise-wide, it all became messy. However, because we had already started, we had to go on. It was only after we got a soft loan that we managed to complete the implementation.

Organizational readiness and change management. Organizational readiness emerged as a major subtheme especially as it concerns project and change management. Ninety percent of the participants noted that a project management approach was necessary for successful implementation of HIT. Participants also highlighted the challenges they had due to lack of organizational readiness, especially regarding funding and computer literacy. Participant 5 explained the need to have a willing project team:

> Then obviously you required to have a willing project team, forceful, and [a] keen astute project team to push through the process. So you have your project team, you have your funds—the finance aspects covered—and then obviously you have the environment—the operational environment—opportune to obviously implement such a change.

Coming from an organization that had successfully implemented an enterprise-wide information system, Participant 9 lauded the role of training and technology literacy

saying, “The most important strategy was to make people aware of the system through training. Also equipping them with technology literacy was a prerequisite.”

Participant 7, similarly observed:

> We had to have the requisite skill in terms of project management—big issue. Why? Because we did not want to overrun costs; we did not want to have the wrong product, we did not want to end up with a product not suited to our environment.

Moreover, Participant 1 also explained.

> The second [strategy] was to go through IT training and also the appreciation of information technology by every employee of the hospital. So everybody was trained in the basic use of the system—basic use of IT and so forth.

Participants also indicated that change management might be difficult to achieve if the change champions are internal people. Such an approach can be met with serious resistance as Participant 3 stated:

> So there was also that change management aspect. It was critical. And we had to get one or two HR consultants to come and to do a change management system. Initially, we tried to do it internally, but we realized that trying to do a change management system with internal people sometimes made some people feel victimized.

Before implementing HIT, organizations need to understand the reasons why this route is important and whether it is the right decision for the organizations. Clear objectives have

to be spelled out to all key stakeholders. Participant 8 explained why the organization embarked on the HIT project:

> So for us, the strategy was then firstly, to sustain our position in the field as having the systems then to be able to cater to that business, and secondly, to make our systems more efficient. So we had to eradicate the manual elements of doing business so that we could speed up reporting. So there was a commercial reality and a legislative reality for us to have that information system.

Solution mapping. The need to come up with the right solution or system was also topical among some participants. Of the participants, 80% indicated that they followed a project management approach that included a gap analysis and solution mapping process. Participant 4 explained the solution mapping process as follows:

> When we started, we had a solution mapping process. This involved having a project team going round and asking users about processes and what kind of system they would want. The team was guided by the business objectives of improving service delivery, cost reduction, and improving efficiency. The project solution mapping team was also mandated to identify a system that [was] user-driven, secure, and met technology demands. The process also involved research and visits to vendors outside the country—studying other systems

I reviewed documents provided by Participant 4 including a 323-page solution mapping document, and multiple standard operating procedure documents and guidelines. It was clear that leaders carried out a thorough due diligence process before making a choice of

the solution to use. The following is an excerpt from the solution mapping document provided:

> The introduction of a new system should enable [the organization] to sustain a competitive advantage over their business competitors through reduced turnaround time. Improved customer service will be achieved through the provision of an on-line real-time system that would avail customer information internally and externally. The system should allow the user to send results reports to referring practitioners through email. The proposed system should result in a reduction of costs through online inquiries thereby reducing the need to print reports, elimination of redundant manual processes, and availability of local system support. Improved efficiency will occur through the provision of a reliable system with the latest technology, flexible and easily adaptable system, and user-friendly system, simple and easy to use. The system is expected to be upgradeable, customizable, and scalable and should meet high security requirements.

Vendor selection. Regardless of the fact that only 50% of the participants mentioned the emphasis on vendor selection, those who did were passionate in believing vendor choice was critical to HIT implementation success. Participant 4 noted:

> Firstly we went to South Africa, but their systems would not meet our needs. We invited several vendors from India, Australia, and China to make presentations. Eventually, we managed to get a solution that met all our needs and was also

> affordable. Looking back, we could have fallen for a cheaper system, which could have been a disaster.

Participant 6 concurred "Our choice came after we had done thorough investigations. One of our competitors had fallen prey to copycats. We also have excellent after service support—which is very important." Participant 9 observed that without considering the choice of a vendor, the project is doomed from the beginning "Absolutely important is the vendor selection. There are many predators and fake software developers out there. You snooze, you lose!"

Hub-and-spoke model. Other strategies used by participating organizations included benchmarking, hub-and-spoke model, centralized data repository, use of consultants, and in-house software development. Participant 3 explained the hub-and-spoke model:

> Since we have centers all over Zimbabwe, we needed to have an EWS [enterprise-wide system]. It was not possible for us to have the system in all places at the same time, mainly due to connectivity and funding issues. So we had to start at the HQ here in [xxx]. After successfully implementing HQ we moved to other centers within the city using the hub and spoke model. We now knew what to do, and so we managed to link all the peripheral centers to the hub—so to speak.

A hub-and-spoke model provides an opportunity for implementation challenges to be identified and corrected before moving to the next business unit. Two of the three hospitals studied used implementation approaches that were explained by the hub-and-spoke model. Participant 2 referred to the hub-and-spoke model as a phase-wise

approach, “So strategically as well we had to look at a phase wise approach, to start with the central most and busiest branches and roll it out nationally.” Researchers have noted that organizations in developing countries can benefit from a phased implementation approach to maximize the available resources in the presence of infrastructural challenges and other implementation barriers (Palvia et al., 2014)

In-house software development. This theme also emerged as a subtheme among participants; who presented it as an alternative to the current challenges with imported systems. Only one of the three participating organizations implemented a software solution developed in-house. Participant 10, whose organization implemented an in-house developed software solution, observed that developing an in-house system was difficult, but a cheaper and more flexible alternative. The participant commented:

> We use a system that was developed in-house with assistance from external developers. We realized that systems developed outside are not a good fit to our local demands, and will require a lot of customization. We hired some external consultants, and they worked with our local team, and we managed to put in place our system – over a period of about three years. The beauty of our system is that we have the source code, and we can tweak it anyhow, and anytime meet our changing demands and business model.

One of the challenges with developing countries is the issue of adoption of systems that are not compatible with the business model. As a result, these systems have to be customized to try and meet the needs of the business. As Sultan et al. (2014) observed, work practices and cultures in developing countries are different from those of developed

nations, making software customization often unavoidable. Turan and Palvia (2014) concluded these differences present challenges to HIT adoption due to incompatibility between the system and work practices and often result in project failures. Therefore, solutions designed in-house may just be a panacea to the many challenges developing countries are having with HIT adoption

Theme 2: Barriers to HIT Adoption

Participants observed that several barriers affected HIT adoption, especially in developing countries. All participants noted that understanding these barriers was critical for successful HIT adoption and implementation. Table 4 lists the barriers to implementation as provided by the participants in the study. The barriers mentioned by the majority of participants were: infrastructural barriers, financial challenges, computer illiteracy, user resistance, connectivity challenges, lack of management buy-in, fear of job loss, lack of skills, and lack of information.

Table 4

Barriers to HIT Implementation

Response	**Respondents**	
	Number	**%**
Infrastructural barriers	10	100
User resistance	10	100
Lack of computer literacy	9	90
Inadequate information on benefits	9	90
Financial challenges	8	80
Connectivity challenges	8	80
Lack of skills	7	70
Privacy and confidentiality issues	6	60

Participants 1 through 10 mentioned user resistance and infrastructural barriers as impediments to HIT implementation. Lack of computer literacy and lack of adequate information on the information system were mentioned by 90% of the participants, while financial and connectivity challenges appeared in responses of 80% of the participants. Other notable barriers included privacy and confidentiality concerns, lack of skills, and security concerns.

Infrastructural and financial barriers. Previous studies (Ahlan & Ahmad, 2015; Bedeley & Palvia, 2014; Bishop et al., 2013; Khalifa, 2014) have shown that infrastructural, and financial barriers are the major reasons why developing countries lag in IT implementation. From the participants' responses, the major infrastructural barriers included connectivity challenges and inconsistent power supply. Connectivity remains an issue as a result of the high cost of bandwidth and absence of a wide network of fiber optic cables. For most healthcare institutions in the country, internet is through satellite technology which is not only unreliable and expensive, but also very slow.

Equally important, and common to all participants was the issue of power outages and grid instability. Participant 3 noted "Alternative power sources have become fashionable for successful organizations in Zimbabwe, and for hospitals, power backup measures are a must have." All participating institutions according to the participants, had in place reliable power backup systems in the form of generators, and sometimes solar energy. However, these were only reserved for critical areas in the hospitals as Participant 6 explained "Of course we have backup in the form of a 20KV generator, but this is reserved for emergency areas only. When we don't have ZESA [grid power], then

we can't use the system." Participant 10 noted even though they had adequate power for hospital operations, HIT implementation was stalled due to incessant grid power cuts. The participant further explained "We had to augment our generators with battery-powered invertors. The implantation process was negatively affected. This was of course at an extra cost."

In all the cases, adequate funding was identified as an impediment to HIT implementation, and a cause for delays in project closure. For example, Participant 2 explained:

> One of the challenges as a unit with barriers was obviously acceptance of IT. For [many] decades people have not been using IT, so a new thing usually comes with little resistance. The other barrier was financing—funding the change of all information technology gadgets in terms of hardware, computers, putting in connectivity; all that cost because the system wants connectivity from the corporate office to the different subunits—those were the biggest barriers. I see infrastructure as a big challenge in African countries, especially electricity and road networks. Adoption is also based on the infrastructure of the nation.

Participant 8 had this to say:

> Infrastructural challenges—the country does not have a very fast internet because of its laws; and because of its nature, it does not have that requirement of a very fast movement of data. So we had challenges of data movement from various sites across the country because of the infrastructure of the country. Where we did not have a fast internet, we did not have the proper routers which could move the

> data, and well—we have a quite huge volume of data which needs to be moved per center. A case in point is what I have just mentioned; where you want to populate we have a centralized system, but it is not practical because of the volumes of data that need to be moved because of the infrastructure which we do not have control over. Even if you wanted to be efficient; and even if you have loads of cash, we have no control over that.

Participant 3 noted that the organization had challenges mainly because it was the first to implement HIT in the country. The Participant added, "To start the process of implementation was difficult. Being the first meant there was no case study for a local implementation. We faced challenges in terms of connectivity and bandwidth was expensive."

User resistance. All participants identified user resistance as a major barrier to HIT adoption and implementation. The major reasons for resistance included the lack of computer literacy, the lack of information on benefits, and fear of the unknown. Participant 5 stated the following concerning resistance as a barrier:

> In any implementation of a system resistance to change is always present. There was initial resistance especially due to fear of the unknown. Most people in the organization did not have computer literacy, and as such were not sure what would happen to them. Some people feared for their jobs thinking that technology was going to substitute them. Another source of resistance was the mere lack of information about the potential benefits of health IT both to the individual and to the organization. People felt there was no role for health information technology.

> Doctors, in particular, felt that this would be a source of delay in care processes due to the data capturing and so forth, which they were not so keen to do. Others also felt that IT would bring in added responsibilities and increased workload.

Lack of information on benefits. Davis (1986) noted that for users to freely accept the use of new technology, they have to be aware of the benefits of the system. This observation is in line with the TAM construct of perceived usefulness (PU). Participants in this study noted that a lack of information, particularly on the potential benefits of the technology was a major barrier. Basic user awareness had to be carried out to make people understand the rationale for HIT adoption and to explain the benefits for the user and the organization. Participant 4 noted, "Another source of resistance was the mere lack of information about the potential benefits of health IT both to the individual and to the organization." Participant 5 agreed, "The most important strategy was to make people aware of the system through training; also equipping them with technology literacy was a prerequisite." Summing it all up, alluding to the critical role of user awareness of benefits, Participant 1 stated, "The people aspect was the critical success factor because many people were involved in the training. This [training] made them aware of the usefulness of the system."

Privacy, security, and confidentiality concerns. Participants 1, 2, 3, 5, and 8 spoke about how physicians, in particular, found it difficult to accept the new technology, citing privacy, confidentiality, and security concerns. Physicians were concerned that confidential information would find its way into wrong hands. In addition, most doctors and other medical personnel lacked basic computer literacy and were more comfortable

with manual systems. According to Participant 1 “resistance from doctors was mainly due to fear of confidentiality breaches, and risking a possible lawsuit.” Suggesting that physicians concern was on both security and respect for patients’ privacy, Participant 2 explained:

> Then also you have the ethics on the line, the norms, the business norms, to say do we go with the business norms, or the ethical norms, or the practice, the discipline norms or to go with efficiency and expediency in the business processes. The movements of results from the investigations center to the recipient and how the recipient is going to, who is the recipient, levels of authority, and all of those issues were quite topical in terms of trying to come up with a system that then is fully automated but yet covering all the aspects of patient care.

Participant 3 put it this way: “As I said there were the peripheral points of security. People had then to realize that we were dealing with medical information.” Participant 5 noted that “Doctors felt that the use of IT may actually lead to breaches in confidentiality, and expose patient data to outsiders.” As a result, doctors were the last to take up the use of HIT. In fact, observation in two sites revealed that some doctors were not entering data at all into the EMR system, due to what they said were “unnecessary delays.” Participant 8 stated:

> But there was a lot of resistance with our external doctors. They didn’t like it. But then the doctors would say, ‘I don’t have time for this. I have other things to go for. I think it is easy and faster for me to write using a pen and paper.’ They

were just saying you are disturbing us. So there was a lot of resistance from the surgeons. They resisted. Maybe it was because of insufficient training of the doctors.

Participant findings indicated that barriers to adoption were indeed a major deterrent to successful HIT adoption. Navigating these obstacles requires proper planning, the involvement of management, and following a project management approach that involves all stakeholders. Evidence suggests that 70% of all IT projects end up as failed projects mainly due to adoption barriers (Abdekhoda et al., 2015; Anwar et al., 2012; Cresswell & Sheikh, 2014). Failure may refer to project overruns, budget overruns, system challenges, inability to achieve intended benefits or outright abandonment of the project. Findings from this multiple case study also suggest that barriers to HIT adoption are not unique to an individual organization. The strategic approach determines the success of HIT implementation projects.

Theme 3: Factors affecting User Acceptance

Participants identified user acceptance as another major barrier to HIT implementation. All the participants made reference to this theme and identified the following as the factors influencing user acceptance: stakeholder involvement, perceived benefits, ease of use, and computer literacy. Table 5 lists these barriers by their frequency.

Stakeholder involvement emerged as the number one game changer in HIT implementation as each and every participant emphasized the role stakeholder engagement played in ensuring implementation success. Nearly as important was the

perceived usefulness of the proposed system, vindicating the TAM as a basis for explaining user acceptance of HIT.

Table 5

Factors Influencing User Acceptance

Response	**Respondents**	
	Number	**%**
Involvement of all stakeholders	10	100
Perceived usefulness / benefits	10	100
User friendliness of system (ease of use)	8	80
Management role and buy in	7	70
Level of computer literacy	6	60

Stakeholder involvement. All participants indicated that user acceptance depended largely on the participation of all stakeholders as well as the perceived benefits or usefulness of the system. The level of computer literacy among stakeholders, user friendliness of system, and management participation and buy-in were also major determinants of user acceptance. Participants noted that it is important to involve stakeholders from the beginning so that they are aware of the intended benefits, and the possible implementation challenges. Allaying stakeholder fears is critical to reducing user resistance, thereby influencing user acceptance (Phichitchaisopa & Naenna, 2013). Participant 2 stated:

> Both customers and suppliers were not engaged. So that [engaging stakeholders] was very key, so that they know whenever we have problems. That way they will also bear with us because we would have informed them and they would have contributed to our system. So its stakeholder management — stakeholder

> involvement in the process. Then there is the aspect of having the buy-in from all the people who will be using the system. You also notice that once people have a notion that the system is not proper, is not functioning well; you will have problems in implementing such as system. So we started by involving people—solution mapping—from the grassroots. These are the people who are on the ground, and the ones who will be using the system; and they were asking questions and giving solutions and different ideas. The IT people then incorporated those ideas, considering the type of processes which the end-users were using to handle their work. So that is how it all started. So they involved everyone. However, the fact that they were involved, and they took in—they were even patient in even teaching them what a mouse is, this is a keyboard. I think that alone was a great strategy for everyone to appreciate though there was resistance initially. Then involve both external stakeholders, involve the management. So the management, all people who are involved in the management—they have to accept it and get involved. And also involve all other people.

Perceived usefulness. Participants' findings indicated that user acceptance was also influenced by how well the stakeholders understood the perceived benefits of the system. Venkatesh and Davis (2000), in TAM 2 noted that perceived usefulness is the most critical determinant of user acceptance of technology. In TAM 2 Venkatesh and Davis (2000), identified (a) subjective norm, (b) image, (c) job relevance, (d) output quality, and (e) result demonstrability as variables that directly influence perceived usefulness. Each of the above factors has an impact on the perceived usefulness of a

system, hence on user acceptance. Participants 1 through 10 noted that the success of HIT implementation in their organizations was mainly a result of the knowledge of perceived benefits by the users. Training and stakeholder engagement were key in creating the needed perception on system usefulness. In most cases, user acceptance only happened when the user could realize and experience the benefits.

Participant 6 stated:

> Initially, there was skepticism about the benefits of HIT. However, as the project members went around, they explained to people about the benefits such as reduction in paperwork, improved queue management, easy access to information among others. This had a result of making people want to be part of the project, and acceptance was not difficult. Everyone felt involved and wanted to be part of the success.

Participant 4 stated:

> You find that user acceptance on the first system—which is the finance-based system—what actually triggered user acceptance was an issue of their involvement initially in the functions requirements document (FRD), which then catapulted in terms of the results of whatever they eventually came up with.

Participant 3 explained challenges observed with user acceptance and how perceived usefulness was a critical factor:

> However, there are some sectors like in terms of our revenue collection side and accounting people. They were jubilant because now this new digital system—integrated straight into their systems—so it enabled them to collect revenue

> quicker. It enabled them to track if there were errors in entry or anything else. And there was a requirement to make sure that those cross-departmental issues were solved. Because the accounting systems were always electronic, they quickly caught on to the system. The other resistance to change was that some quarters even in the senior management felt that it [the system] was not a worthwhile investment. As we went on especially on the outstation branches; they started seeing the benefits quite quickly, and their business went up, because we were now able to give them reports 48 hours earlier. Acceptance came as people got more confident in using the systems. And so over time it settled, but for the radiologists, it took more than a year for them to settle into the new system. But choice is always a difficult thing. So most of the concerns came from not knowing how the system will impact them in terms of their jobs and their working systems.

Participant 5 noted:

> What made people be more acceptable like they were told Apex, when it is coming, it is going to reduce costs, there is going to be paperless, and it was going to improve our performance; and also it was going to improve our time. We were going to have more time centered on our patients. Moreover, we were going to have better serving of our patients.

The findings indicate the importance of perceived usefulness and give credence to Venkatesh and Davis (2000) TAM 2 as a valid model for use in HIT adoption. From the findings, job relevance, output quality, and result demonstrability positively impacted perceived usefulness, which in turn influenced user acceptance.

Perceived ease of use. The subtheme of perceived ease of use was universal among the participants. This subtheme dovetailed well with the fact that most of the participants in all the cases noted that computer literacy was lacking among employees. As a result, training had to be undertaken to teach users basic computer literacy. This lack of computer literacy was a cause of anxiety for many, and according to Participant 1 most users complained that computers were difficult to use. Technology anxiety was universal across all participant organizations, particularly among the end users. Interventions to reduce anxiety included the use of project champions, continued stakeholder engagement, and tailor-made training to suit the levels of IT literacy among users. Participant 7 explained:

> There was a lot of fear and anxiety among workers. Most thought that they will never be able to use the system as they were not computer literate. Others even felt that it was impossible for them to be trained. Just the mention of a computer sent shivers down their spines. It took the project champions to explain that the system was not difficult and that enough time would be given to training. When training started, there was a change in attitude, but some of the older people decided to quit.

Participant 2 added this insight:

> So there was a bit of reluctance, call it a bit of resistance on that front. So there was a need, so how they went round was to have a situation where all the nurses, the nursing staff, and especially the doctors had to be taken round, have computer

literacy based courses to have an appreciation of what the organization wanted to implement.

The level of information technology literacy. The users' perceptions of the ease of use of the system also impacted user acceptance of HIT and required management to commit to training, stakeholder engagement, and change management. The issue of lack of computer literacy was an important factor in adoption and implementation, as it was not only a barrier but also a source of fear and apprehension resulting in user resistance. However, Ketikidis et al. (2012) noted that perceived ease of use is not as important as perceived usefulness. This point notwithstanding, all participants noted that a significant proportion of employees were not computer literate and were consequently afraid of failing to use the new system. Participant 1 noted, "For decades people have not been using IT, so a new thing usually comes with some resistance." Similarly, Participant 10 explained:

> So there was a period were people had to actually go from the basics of computer training, because they were totally manual. They were used to typewriters and taps, those recording tapes. So some people had to have a total rework of how they worked, which was a big challenge. And for some of them who could not cross the bridge, they had to be reassigned to other duties.

While computer literacy was a major emerging theme, participant findings indicated that appropriate interventions in the form of training, and equipping users with the requisite skills were major strategies used in all the three cases studied. Training had an effect of allaying computer anxiety, improving user perceptions on the system

benefits, and, subsequently, generating desire to be part of the HIT success story in the different organizations. However, there were in all cases, according to the participants, casualties along the way, as some individuals felt that they would never be able to use a computer.

Linking to Conceptual Framework

I used the technology acceptance model (TAM) described by Davis (1986) as the conceptual framework for this study. Davis (1986) postulated that two constructs—perceived ease of use (PEOU), and perceived usefulness (PU)—influenced the technology adoption and usage behavior of individuals. The findings from this study, analyzed in light of TAM, clearly confirm that both PEOU and PU are critical elements in the adoption of HIT. However, the findings also suggest that there are some other determinants of acceptance of technology in healthcare. PU and PEOU alone cannot adequately explain the slow adoption rate and the continued resistance, especially from physicians.

While some industries have accepted TAM as a standard model for technology acceptance, there has been a concern with the model's assumption that technology acceptance is voluntary (Moores, 2012). HIT adoption requires the active participation of all users, who should conform to the new technology to achieve maximum potential benefits (Holden & Karsh, 2010). Hence, to use TAM alone to explain acceptance or resistance to technology use in healthcare is inadequate.

Holden and Karsh, (2010) reviewed the application of TAM to healthcare and concluded that, though the model predicts a substantial portion of the use or acceptance

of HIT, the theory may benefit from several additions and modifications. In line with previous studies of technology acceptance in healthcare settings, Ketikidis et al. (2012) reiterated the need for a modified version of existing TAM approaches to understand better healthcare professionals' acceptance of HIT systems. While TAM 2—an improvement of the original TAM—has managed to address some shortcomings of TAM in HIT implementation, Marangunić & Granić (2014) stated that models of technology implementation in healthcare must be dynamic to meet the demands of the health sector as a complex adaptive system.

Applications to Professional Practice

The purpose of this qualitative multi-case study was to explore strategies that healthcare leaders in Zimbabwe used to implement HIT. Responses from participants, organizational documents, observational findings, and conclusions of the review of the literature provided the basis for understanding HIT challenges with HIT implementation in developing countries. Participants' perceptions regarding HIT implementation strategies, barriers to adoption, benefits of HIT adoption, and factors influencing user acceptance reinforce affirmations in the literature that HIT adoption requires proper project planning, user involvement, and leadership from healthcare leaders (Bedeley & Palvia, 2014). According to the participant responses in this qualitative, multi-case study, the results indicated best practices that may influence other organizations to replicate strategy readiness, acceptance, and usefulness of the HIT.

The findings from this study may assist healthcare leaders in developing countries to make informed decisions about HIT investments and adopt efficient technologies by

adopting successful HIT implementation strategies. Healthcare leaders in developing countries can also leverage technology to break the infrastructural barriers by increasing access to healthcare through telecare and telemedicine facilities as previously observed by Van Dyk (2014). Based on the findings of this study, high-level policy makers can define better strategies and policies for their countries' health systems.

The findings also bring to the fore that technology adoption in healthcare requires a dynamic model that accommodates the complexities of the discipline. HIT adoption requires a multidisciplinary approach with the involvement of all stakeholders. The process should not only be about how people accept technology in healthcare, but also how developers and vendors view healthcare when coming up with healthcare technology solutions. In healthcare, implementation requires taking a broad look at who the users and beneficiaries of intended technology are and how those users, from the physicians to the patients, perceive technology and its impact particularly as it relates to intrusions into their private lives (Schoville & Titler, 2015).

From the findings in this study, physician acceptance is a major obstacle to HIT adoption. In this regard, healthcare leaders should develop mechanisms to convince physicians that HIT will not deprive them of their independence but rather will facilitate the task of delivering healthcare more efficiently. To get physician buy-in, leaders need to address adequately the issue of information security and privacy and ensure that HIT does not conflict with the autonomy to which most healthcare professionals are accustomed. Healthcare leaders will need to involve all key stakeholders from the outset, as failure to do so is the surest recipe for failed HIT implementation.

Implications for Social Change

Study findings support the benefits of HIT adoption in healthcare institutions in developing nations. Benefits include improved decision making, the ready availability of information, increased productivity, process and systems efficiency, reduction in medical errors, as well as improved healthcare outcomes. Improved decision making positively affects society thereby acting as a catalyst for social change. Embracing HIT could result in improved healthcare decisions and in positively influencing the patient experience. The results of this study could affect social change by providing leaders in developing countries with knowledge and skills to use HIT as a key strategy to yield more and better healthcare at lower costs while creating employment for communities. Positive social change can occur through improving patient experiences in healthcare as superior satisfaction aligns with a higher quality of care. By using HIT, healthcare organizations in developing countries can position themselves more competitively in the industry, while focusing on initiatives that can improve the quality of care.

Recommendations for Action

Examination of the responses from participants, review of the organizational documents, and analysis of observational findings led to the emergence of multiple themes concerning HIT implementation strategies used by healthcare leaders. Recommendations from this study might motivate healthcare leaders to develop a positive orientation on HIT, and adopt proven HIT implementation strategies for use in their organizations. First, healthcare leaders should adequately plan for HIT implementation projects, based on the business model, and informed by the intended

outcomes. It is critical that leaders understand what the basis for introducing an HIT system is and how it will be beneficial to the organization. Without proper planning, chances of project failure are high. Second, leaders should ensure that there are adequate financial resources available before embarking on an HIT project. Sufficient funding is necessary so that there are no disruptions during the project. Funding is required for the entire project cycle for purposes of hardware and software purchases, vendor selection, training of users, as well as licensing of software.

Investment in alternative sources of energy such as solar power, generators, and invertor technology will go a long way in addressing implementation challenges related to power outages. Power challenges not only affect the implementation process, but can also damage installed hardware leading to loss of equipment and data. In this regards, leaders need to invest in robust power and data backup systems so that there is continuity of operations. Manual backup systems should always be maintained especially in an environment where there is electricity and connectivity instability.

In line with TAM, perceived usefulness of the system is the most critical attribute to user acceptance. Leaders need to ensure that in choosing a system, users are involved from the beginning and that whatever system is chosen, it should be one that users are willing and ready to use. Training is critical to get the buy-in of all stakeholders, who should, before going live, clearly understand not only how to use the system, but also its potential benefits. In this regards, training should also focus on equipping potential HIT users with knowledge on the benefits to the organization, and to them as individuals.

Another recommendation is that developing countries need to assess properly proprietary software, and determine whether it is customizable to the local situation. Some projects, according to the findings of this study and from the literature, indicate that project failure in developing countries also results from adoption of a system that is not a fit to the business model and to the economic circumstances in the developing world. Most vendor HIT products are developed externally and are not customizable to meet requirements of the developing countries. It would be desirable for local experts to learn software development in developed countries and then develop generic systems for use in developing countries. Indeed, there is evidence that where institutions have control of the source code, it is possible to improve and develop the software.

Leaders must recognize the importance of engaging clinicians in the adoption and implementation of HIT. Thus, clinical leadership, collaboration, effective communication, and commitment to education, training, and awareness-raising sessions, are critical success factors in HIT implementation process. While clinical leadership is essential, management commitment and a multidisciplinary approach are required. A dedicated change management team should ensure that the hospital authorities undertake a highly collaborative approach to regulate the rate of change and ensure the hospital realizes organizational change objectives fully. For example, the commitment of top management to support the implementation is a key factor in the success of every HIT project since it is necessary for senior management to allocate an adequate budget and make available the resources required during the adoption process.

To minimize user resistance, leaders should focus on making users aware of the benefits of the system to the organization and how the end-users will also benefit. This approach is in line with the TAM constructs of PU and PEOU. If more end users are aware of the system benefits, then there will be greater user acceptance. To encourage user acceptance, Holden and Karsh (2010) suggested identification of factors that influence user intentions. Further, a user develops a positive attitude towards use when there is awareness or evidence that new technology would improve performance.

The findings from this study and the recommendations are significant in that healthcare in developing countries is undergoing a transformation in line with global standards of quality healthcare outcomes. Adoption of some of the recommendations herein may influence healthcare leaders in developing countries to implement HIT successfully. To maximize the distribution of information from this study, for the benefit of healthcare leaders, I will make use of a variety of distribution channels. Students and researchers will be able to access this study after publication in the ProQuest/UMI database as well as Walden Scholar works. As a gesture of appreciation, and for feedback purposes, I will provide each participant with a summary of the study findings and recommendations. Additionally, I will work on publishing an article about the study in a scholarly, peer-reviewed journal.

Recommendations for Further Research

I used a purposively selected sample of participants from hospitals in Zimbabwe and used observations and organization documents as the foundation for understanding HIT implementation strategies used by healthcare leaders. From the analysis of the data

collected from in-depth interviews with participants, documents review, and observations, I identified strategies used by leaders in successful HIT implementation. Since this study focused on a few hospitals in Zimbabwe, further research on a broader population and a larger sample could provide additional insight and clarity on HIT implementation strategies.

One recommendation for further research includes the exploration of provider responses to strategies used to overcome barriers to HIT in other developing countries. Researchers could employ a qualitative approach similar to that used for this study to explore how a broad spectrum of providers across Africa describe strategies used to implement HIT.

Future studies should focus on critical success factors such as overcoming barriers and achieving user acceptance. There is also need to explore the benefits of HIT adoption to inform leaders on the impact of adoption on organizational profitability, productivity, and healthcare outcomes. There is still a lack of compelling evidence on the benefits of HIT, and this has been detrimental to efforts to speed up adoption in developing countries. Finally, further research is required on the perceptions of healthcare providers, especially physicians, on the impact of HIT on medical decisions, clinical outcomes, medical errors, and post-implementation HIT system expectations.

Reflections

In conducting this multi-case study, my goal was to enhance my research skills and experience as I explored a topic that was not only of global interest, but also close to my heart. By conducting in-depth interviews with participants, I managed to obtain a

deep insight of the strategies healthcare leaders in Zimbabwe use to implement HIT. Throughout the conduct of the study, I acknowledged the possibility of personal bias or preconceptions, so it did not interfere with study findings.

As a healthcare manager with experience with HIT, I had to identify personal biases about HIT implementation and the challenges that leaders have with change management. To minimize personal biases, I used bracketing during interviews and remained focused on the study process during data organization and analysis. The findings from this study have enhanced my understanding of user acceptance of technology. People are not technology averse, but for them to be receptive to change, they need to believe that the new system will enhance their job performance and bring benefits to the organization.

Conclusion

Healthcare technology can potentially reduce operational costs, reduce medical errors, and increase healthcare quality through improved healthcare processes (Zineldin, Zineldin, & Vasicheva, 2014). Adoption of HIT in the developing world is lagging behind adoption in the developed countries (Turan & Palvia, 2014). Several factors influence adoption of HIT in the developing countries ranging from lack of resources to lack of skills (Ahlan & Ahmad, 2015). However, healthcare leaders in developing countries often lack strategies to implement HIT successfully.

This study's purpose was to explore strategies used to implement HIT in developing countries. Various strategies emerged from the findings including proper planning, project management approach, adequate funding arrangements, the

involvement of all stakeholders, training on IT literacy, stakeholder awareness on benefits, and linking the HIT project to the business model. Healthcare leaders also need to work on effective change management to achieve user acceptance and stakeholder buy-in during and after the implementation process. The findings and recommendations from this study provide a compilation of strategies that healthcare leaders in developing countries could use for successful HIT implementation.

All participants in the study concurred that HIT offers many benefits to healthcare, including improved productivity, increased profitability, improved quality healthcare outcomes, and an avenue for healthcare research. Knowledge of these benefits by stakeholders provides a strong foundation for successful HIT implementation. Numerous barriers stand in the way of successful HIT implementation for HIT leaders according to the study findings. The major adoption barriers in developing countries include funding challenges and infrastructural challenges. Leaders, therefore, should work on implementing strategies focused on overcoming these obstacles.

Finally, the findings of the study suggest that the Zimbabwean healthcare system has providers and stakeholders who are quite knowledgeable about the benefits of HIT and are willing to embrace the technology in their workflow. This realization is reassuring and should prompt healthcare decision makers in Zimbabwe in particular, and in developing countries, in general, to formulate policies and introduce appropriate interventions that encourage nationwide adoption and acceptance of HIT.

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Appendix A: Informed Consent Form

You are invited to take part in a research study to determine what strategies healthcare leaders use in implementing health information technology (HIT).You are being invited because you meet the criterion of being a leader or end-user in a health institution in Zimbabwe, which has attempted to implement or successfully implemented HIT. This form is part of a process, called “informed consent,” to allow you to understand this study before deciding to take part. Nixjoen Mandaza Mapesa, a doctoral student at Walden University, is conducting the study.

Background Information:
The topic of the study is Health Information Technology Implementation in Zimbabwe. The purpose of the study is to collect data that will aid the researcher in obtaining information on the research question, "What strategies are used by healthcare leaders in implementing health information technology?"

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

- Answer questions in regards to HIT implementation strategies in Zimbabwe.
- This is a one-time audio recorded interview that will take approximately 30-60 minutes.

Here are some sample questions:

1. What strategies do you use to implement HIT?
2. What are the critical factors you use to implement HIT?

Voluntary Nature of the Study:
This study is voluntary. Everyone will respect your decision as to whether or not you choose to be in the study. No one will treat you differently if you decide not to be in the study. If you decide to join the study now, you may still change your mind later and end your participation at any time.

Risks and Benefits of Being in the Study:
The time commitment related to this study is that you complete the 30 to 60-minute interview during or after normal work hours with Nixjoen Mandaza Mapesa. You will be given a copy of the results of this study for your personal information. There are no other risks related to this study. More importantly, your participation will contribute to the knowledge base relevant to HIT implementation strategies used by healthcare leaders.

Payment:
There will be no compensation provided for your participation in this study.

Privacy:
Some individuals in the company may know that you participated in the study. However,

any information that you provide (e.g., responses to interview questions) will be kept confidential. The researcher will not use your personal information for any purposes outside this research project. Also, the researcher will not include your name or anything else that could identify you in the study's reports. The electronic information will be stored on a password-protected external hard drive, and documents related to this study will be kept in a locked file storage cabinet that only the researcher will have access. Data will be kept for a period of at least five years, as required by the Walden University.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via phone number +263774453151 and/or email at nixjoen.mandazamapesa@waldenu.edu. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott, the Walden University representative who can discuss this issue with you. Her phone number is 1-800-925-3368, extension 1210. Walden University's approval number for this study is **02-11-16-0389686**, and it expires on **February 10, 2017.**

The researcher will give you a copy of this form to keep.

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, I understand that I agree to the terms described above.

_____

Printed Name of Participant_____

Date of consent_____

Participant's Signature_____

Researcher's Signature_____

Appendix B: Interview Questions

1. What strategies have you used to implement health information technology (HIT)?
2. Which of these strategies worked best?
3. What were the critical success factors?
4. What barriers did you encounter and how did you overcome them?
5. How well has the organization achieved user acceptance?
6. What factors influenced user acceptance?
7. What, if any, were the concerns regarding adoption and implementation?
8. What training, development, or policy influenced the implementation process?
9. How has your organization benefited from HIT adoption and implementation?
10. Do you have anything else to add that I have not asked about HIT implementation?

Appendix C: Case Study Protocol

A. Case Study Introduction
    1. Research Question
        a. What strategies do healthcare leaders use in implementing health information technology (HIT)?
    2. Conceptual Framework
        a. Technology acceptance model (Davis, 1986)

B. Protocol Purpose and Intended Use
    1. Protocol to be used by the researcher to guide and inform all study data collection, analysis, and findings and conclusions preparation efforts
    2. Researcher will use the protocol to ensure dependability of case study methods, findings, and conclusions

C. Data Collection Procedures
    1. Data to be collected from the review of company documents, on-site observations and the conduct of semistructured interviews with healthcare leaders and users of HIT.
    2. Researcher will recruit interviewees from three hospitals in Zimbabwe that have successfully implemented HIT
    3. Specific study sites and contact persons at each site to be identified after letters are sent and responses received to finalize sites and interviewees
    4. Expected preparation activities to take place before site visits to conduct interviews

a. Preparation of informed consent forms for each interviewee

b. Review and finalization of planned interview questions

5. Data collection tools

a. Digital audio recordings

b. Researcher field notes

c. Case study database

D. Case Study Interview Questions

1. What strategies have you used to implement health information technology (HIT)?
2. Which of these strategies worked best?
3. What were the critical success factors?
4. What barriers did you encounter and how did you overcome them?
5. How well has the organization achieved user acceptance?
6. What factors influenced user acceptance?
7. What, if any, were the concerns regarding adoption and implementation?
8. What training, development, or policy influenced the implementation process?
9. How has your organization benefited from HIT adoption and implementation?
10. Is there anything else that I have not asked that you would like to share with me?

E. Data Analysis Techniques and Tools

1. Coding (deductive and inductive)
2. Analysis tools

a. Nvivo

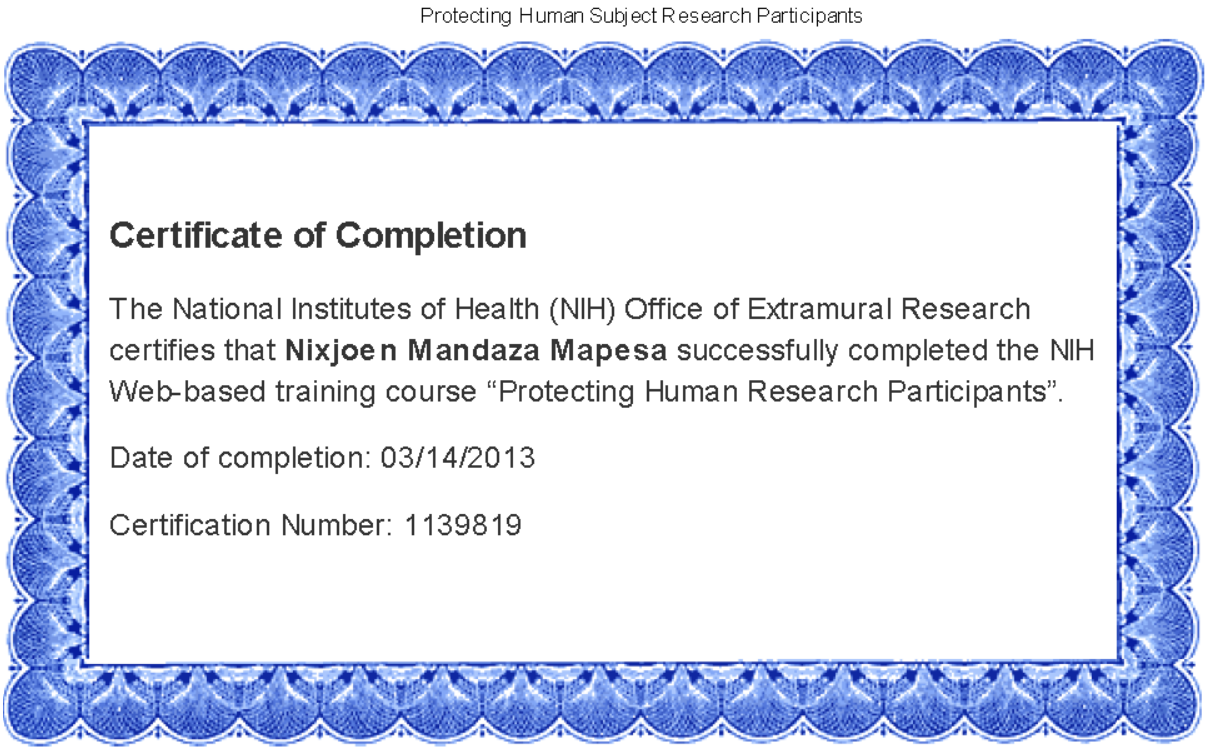
F. Study Dependability, Credibility, and Transferability Methods

1. Dependability methods
    a. Case study protocol use
    b. Case study database creation
2. Credibility and transferability methods
    a. Multiple data sources (credibility)
    b. Assessment of rival explanations, research bias identification, and member checking (credibility)
    c. Rich description of study sample population and context and use of field review panel (transferability)

G. Outline of Case Study Report Contents

1. Overview of study
2. Presentation of the findings
3. Applications to professional practice
4. Implications for social change
5. Recommendations for action
6. Recommendations for further study
7. Reflections
8. Summary and study conclusions

Appendix D: National Institutes of Health Certificate of Completion



Appendix E: Email Invitation

Dear _____

My name is Nixjoen Mandaza Mapesa, and I am a Doctor of Business Administration (DBA) candidate at Walden University. I am conducting research to complete my DBA degree. You are invited to take part in a research study to determine what strategies healthcare leaders use in implementing health information technology (HIT).

Did you know that healthcare organizations could achieve up to 10% savings in operational costs, increased revenue, and improved patient outcomes as a result of successful implementation of health information technology? However, the adoption rate of HIT remains depressed in developing countries with investment in HIT constituting less than 1% of the total investment in healthcare. In this study, I will investigate the strategies used by healthcare leaders in Zimbabwe to implement HIT. There are some specific criteria for participants to be included in this study. They are:

- A leader with decision-making role in HIT implementation in a healthcare institution in Zimbabwe,
- An individual who works in an institution that has successfully implemented HIT

If you meet the above criteria and agree to be in this study, please contact me via email at nixjoen.mandazamapesa@waldenu.edu or by phone at 0774453151. I will ask you to sign a consent form (attached to this email). You can decide if you would rather I interview you in person or by phone. I will schedule an appointment convenient for you, respecting your busy schedule. The interview should last no more than 30 to 60 minutes.

Thank you so much for this opportunity for me to involve you in this important study.

Appendix F: Observational Protocol

A. Research Question
    a. What strategies do healthcare leaders use in implementing Health Information Technology (HIT?
B. Protocol Purpose and Intended Use
    a. Protocol to be used by the researcher to guide and inform data collection through observations made on site before and during the conduct of interviews.
C. Observation Procedures
    a. Observations will only be done at the time of the interview process if conducted at the site of the interview participants.
    b. On entering the site, the researcher will note any artifacts related to health information technology (e.g. hardware, workstations, etc.).
    c. Comment on the activity and emotional/affective atmosphere (e.g., energy, excitement, engagement, boredom, irritation, indifference) on the workstations.
    d. Comment on what seem to be the most important things happening or not happening at the workplace?
    e. During the interview, the researcher will observe and document facial expressions and mannerisms of the interviewee.
    f. Immediately after completing the interview the researcher will document and summarize all observations in a case study journal.

Appendix G: Letters of Cooperation

Letter of Cooperation

[redacted]

February 15, 2016

Dear Nixjoen,

Re: Permission to Conduct Research: Nixjoen Mandaza Mapesa

Based on my review of your research proposal, I give permission for you to conduct the study entitled **Health Information Technology Implementation Strategies in Zimbabwe** within [redacted]. As part of this study, I authorize you to recruit and interview willing participants. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: assisting the researcher in identifying potential participants for the study, and allowing the researcher access to observe the HIT systems within the institution. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

[redacted]

[redacted]
MANAGING DIRECTOR

Letter of Cooperation

[redacted]

February 17, 2016

Dear Nixjoen,

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Based on my review of your research proposal, I give permission for you to conduct the study entitled **Health Information Technology Implementation Strategies in Zimbabwe** within [redacted]. As part of this study, I authorize you to recruit and interview willing participants. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: assisting the researcher in identifying potential participants for the study, and allowing the researcher access to observe the HIT systems within the institution. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

[redacted]

GENERAL MANAGER

[redacted]

Letter of Cooperation

February 18, 2016

Dear Nixjoen,

Based on my review of your research proposal, I give permission for you to conduct the study entitled Health Information Technology Implementation Strategies in Zimbabwe within the As part of this study, I authorize you to recruit and interview willing participants. Individuals' participation will be voluntary and at their own discretion.

We understand that our organization's responsibilities include: assisting the researcher in identifying potential participants for the study, and allowing the researcher access to observe the HIT systems at the institution. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

Clinical Director