SCHOOL OF PUBLIC HEALTH

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EVALUATING THE BARRIERS AND BENEFITS REALIZATION IN E-HEALTH SOLUTIONS IMPLEMENTATION AND ADOPTION IN GHANA

A CASE STUDY OF THE VOLTA RIVER AUTHORITY HEALTH SERVICES LIMITED (VHSL)

BY

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DECLARATION

I hereby declare that apart from referencing other people's work that I have duly acknowledged, this project is my original work, produced from a study I undertook under supervision and that no part or whole of this project has been previously submitted to the University of Ghana or any other University for a degree. I therefore submit this project to the Department of Biostatistics, School of Public Health, University of Ghana, in partial fulfillment of the award for Master of Science in Health Informatics.

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(SUPERVISOR) DATE 31/03/2021

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LIST OF ABBREVIATIONS

BPA	Benefits Plan Assessment
BR	Benefits Realization
BRA	Benefits Realization Assessment
BRM	Benefits Realization Management
CDSS	Clinical Decision Support System
CPOE	Computerized Physician Order Entry
EHR	Electronic Health Record
EMR	Electronic Medical Record
ESD	Engineering Services Department
FND	Finance Department
GHS	Ghana Health Services
GoG	Government of Ghana
HGD	Hydro Generation Department
HIMS	Health Information Management System
HIS	Health Information System
HIT	Health Information Technology
HRD	Human Resources Department
ICT	Information & Communication Technology
IT	Information Technology
m-Health	Mobile Health
MIS	Management Information Systems
MOH	Ministry of Health

NSWG	New South Wales Government
OGC	Office of Government Commerce
PHI	Public Health Institute
PMI	Project Management Institute
SDG	Sustainable Development Goals
PRD	Procurement Department
TGD	Thermal Generation Department
TSD	Technical Services Department
UN	United Nations
VAD	VRA Academy
VHSL	VRA Health Services Limited
VRA	Volta River Authority
WHO	World Health Organization

ABSTRACT

Goal 3 of the United Nations (UN) Sustainable Development Goals (SDGs) is to ensure healthy lives and promote well-being for all at all ages by the year 2030. Despite the huge improvements made over the past few decades in health care delivery, the current health priorities and targets in the low-and-middle income countries such as Ghana, appear ambitious. Achieving these priorities or ambitious targets demands innovative approaches. In order to successfully overcome the barriers, the global health community has recognized the value of e-Health solutions as a transformational tool to accelerate progress in improving global health outcomes.

Volta River Authority, a quasi-public institution where this study was carried out adopted an EMR, a e-Health solution in the year 2012 to improve on quality of care, efficiency, collaboration and communication among clinical staff as well improving health workers productivity. The study assessed clinical and non-clinical staff's perception on the expected benefits, post-implementation level of satisfaction, implementation challenges as well level of knowledge of BRM.

The study employed quantitative research method, using structured questionnaire as the main data collection instrument. Participants were drawn from ten departments of the Authority based on their interactivity with the system, whiles departments were selected on the basis of staff strength of twenty or more. Descriptive statistics were employed to summarize the demographic data and binary logistic regression was used for inferential statistics on the differences in perception of the expected and realized benefits.

The findings show that stakeholders expectations of the e-Health solution were higher whiles levels of satisfaction with the solution is low. The study identified that benefits realization management knowledge and expertise among project team members is very low.

To enable VRA/VHSL management derive the expected benefits from the current e-Health solution, all system's processes must be comprehensively reviewed, and all the network infrastructure upgraded to improve efficiency. Secondly, a benefits realization management framework must be adopted for IT projects with well-trained staff on BRM.

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CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

Health Information Technology, otherwise known as e-Health solutions are not new. However, these solutions are highly sophisticated systems that require specialized skill and knowledge, coupled with top institutional management or governments' commitment for their implementation.

e-Health solution comprises "all concepts and activities at the intersection of health and information and communication technology (ICT), including mobile health (m-Health), health information technology (IT), health information systems, wearable devices, telehealth, and telemedicine" (Wolper, 2010). Logically, e-health solutions as a technology by itself cannot realize its own benefits. According to Badewi (2016), activities in organizational change puts benefits at the central point for all the actors'. Benefits realization management in Information Systems and Information Technology (IS/IT) projects is gaining the right or appreciable recognition. Ward and Daniel (2012) concluded that the increases in business value can only be realized by adopting a benefits-driven approach to managing IS/IT and other projects. According to Serra & Kune, (2015) there still remain challenges in realizing benefits in spite of the agreement about the strategic importance of IS and the huge investments in implementation.

From available literature, it is evident that studies on related topic are usually carried out in advanced countries. There is a dearth of knowledge on benefits realization management in e-health solutions implementation in particular in Ghana.

Adopting and applying e-health solutions in quite a number of countries, some advanced and others developing, including Ghana have been rather slow, despite the numerous identified benefits such solutions portend to provide. The Government of Ghana in 2005, identifying the new opportunities offered by Information and Communication Technology (ICT) in improving health services access and ensuring that health resources are managed effectively, promulgated the Health Sector ICT Policy and Strategy (MoH, 2005). This provided the foundation for the development of ICT framework and architecture for e-health solutions implementation and adoption in the health sector (MoH, 2005).

The objectives for the policy and strategy (MoH, 2005) include:

- Improving information and communication technology infrastructure in health
- Improving accessibility and management of health information
- Improve access to quality health services
- Improve ICT knowledge, capability and utilization among health workers.

Though much has not been seen after the launch of the policy in Government facilities, some private health facilities such VRA hospitals, SSNIT hospital, Nyaho Clinic and others introduced Electronic Patient Records (EPR) and Health Administration Management System (HAMS) to replace the legacy paper files for patients data and records management (Acheampong, 2012). In 2010 however, the e-health national strategy, that seeks to streamline the health data regulatory framework and management of information, build capacity of the sector for wider application of e-health solutions, increase access while building the parity gap by using ICT and heading towards a paperless record and reporting systems (Afarikumah, 2014).

Over the past few years, Ghana has committed itself to e-health solution as a major response to the changing nature of challenges faced in delivering quality and timely healthcare. According to the Ghana Health Sector ICT Policy and Strategy, the introduction of online registration and renewal of the National Health Insurance Services (NHIS) membership, the adoption of the District Health Information Management System (DHIMS) and the web-based version, DHIMS-2 are all part of a broader policy towards the implementation of a national e-health solution (MoH, 2005).

The tremendous growth of the Internet in the last twenty years has contributed immensely to the several innovations in health informatics. One would have concluded that these sweeping technologies would be easily embraced or adopted. The verdict however is that innovative health care technologies or e-health solutions requires transformative change, which naturally encounters stiff opposition sometimes (Tan, 2008). Solutions such as Electronic Health Records (EHR) has been identified as holding a great promise as increasing numbers of governments and care providers concluding that such solutions have invariable become essential for providing high quality health care services (Zielinski, Duplaga, & Ingram, 2007).

Increasing access to goods and services in e-health solutions, making it inexpensive and sustainable can surge improvement toward better health outcomes (Tan, 2008). According to Tan, (2008), Wolper (2011), and Weaver et al. (2012), e-health solutions can also improve quality of care when expertise is centralized, and less-skilled health workers are trained through using the internet or online platforms. Additionally, Burke & Weill (2018) and Amatayakul (2013) in other studies reported that e-health technologies can help reduce unnecessary referrals to hospitals. Moreover, e-health solutions are not only expanding

access, but also putting power in the hands of patients themselves (Amatayakul, 2013). Patients can be empowered to be responsible in managing their own health and providers can also be empowered through clinical decision support and constant training (Daim et al. 2006).

1.1 Benefits Realization

Technology is identified as the leading vehicle playing an increasing role in every domain of our lives and in the delivery of public services, including health care. Information and communications technology (ICT) has become fundamental to our work, free time activities and services delivery over the past 20 years (Musawir, Serra, Zwikael & Ali, 2017). It is important that ICT-enabled projects pay attention on benefits for users and service providers. Inevitably, not all projects go to plan (Ward & Peppard, 2012). Some intended benefits of ICT-enabled projects are not being realized, in extreme cases, perform worse and misuse the public funds. A response to rationalize investments in IT projects resulted in the development of the Benefit Realization Management (BRM) concept in the 1980s and 1990s (Bradley, 2006). This concept has changed over the years and has been differently interpreted in various countries and industries (Breese et al., 2015).

Bradley (2010) defined Benefit Realisation Management (BRM) as "a process of organising and managing, so that potential benefits, arising from investment in a change, are actually achieved", whiles Ward & Daniel (2006) explained Benefit Management (BM) as "the process of organising and managing such that the potential benefits arising from the use of Information Systems and or Information Technology are actually realized". According to Thorp (2003), further corroborated by Peppard (2007), for benefits to be expected from any Information Technology investments it should be properly managed. e-health solutions

benefit therefore should be managed through monitoring the organizations' change process until the realisation of the solution.

1.2 Challenges to e-Health Solutions

e-Health solutions provide hope and greater promise for health care delivery and patient safety as all stakeholders recognize that these ICT enabled-solutions have become necessary for providing high-quality healthcare services. The Health sector continues to receive investments and high government budgetary allocations into IT infrastructure development. However, despite all the perceived benefits and advantages of e-health solutions, there are still challenges to their implementation and adoption. Anticipating these challenges in the early stages in the implementation life cycle helps overcome them or at least reduces their intensity (Amatayakul, 2013). Challenges to systems implementations or change in general are many and varied. These challenges may be real or perceived or as identified by the Public Health Informatics Institute (PHII, 2018), could be a combination.

Among these challenges from literature whose studies have focused on countries with advanced healthcare systems such as the United States of America, the United Kingdom, Switzerland, and Sweden include clinician resistance, legality of the e-health solution, commitment of leadership to the implementation, privacy and security concerns with patients as well as the skill and expertise to identify the business challenges and how to address them (Lin & Pervan, 2003; Reiss, 2006; Serra & Kunc, 2015).

In the case of Ghana, the 2005 and 2010 Health Sector ICT Policy and Strategy and the e-Health national strategy respectively identify among other things a weak telecommunication

infrastructure, an inadequate capacity in ICT human resources, planning and financial constraints as the major barriers to e-Health adoption and implementation (MoH, 2005).

1.3 EMR at VRA

In the year 2010, The Volta River Authority (VRA) decided to leverage on Information Technology by embarking on a programme dubbed "BTB" (business-to-business transformation), with the aim of automating all their business processes across various departments. As part of this organizational transformation the Authority implemented the Hospital Information Management System (HIMS), which was later named as Carewex, at its Health Services Department, which later became known as the VRA Health Services Limited (VHSL), after it has been registered as a strategic business unit (SBU) and a limited liability company status, with the authority owning 100% shares. The VHSL consists of four health facilities. Two hospitals, the largest of which has the status of a district hospital is located at Akosombo and serves not only staff and their dependents but also provides free healthcare services to the entire Asuogyaman district and beyond, whiles the other is located at Aboadze, near Takoradi in the Western region. The others include community based clinics in Akuse, and Accra. The e-health solution was implemented to provide a suitable information technology system that will allow VHSL to fully automate the business processes and patient care procedures.

1.4 Problem Statement

Some earlier studies have concluded that e-health solutions are being adopted to reduce inefficiencies, improve access, reduce costs, increase quality, and personalize care

(Amatayakul, 2013, Burke & Weill, 2018, Zwikael & Smyrk, 2019). Particular technologies such as online claims processing, electronic prescription (e-prescription) systems, and teleradiology, all of which have been successfully leveraged by different parties, at one time or another, to serve as tools for combating rapidly escalating healthcare administrative costs while simultaneously increasing efficiencies, eliminating redundancies, and improving the quality of healthcare services (Wolper, 2011). However, these solutions like many other software applications development and implementations encounter many challenges (Serra & Kunc, 2015; Musawir et al., 2017; Ward & Daniel, 2012). Other studies have also confirmed that realizing the benefits of implementing e-Health solutions is dependent to a greater extent on the health care provider and clinician's interest and appreciation in the use of technology (Xierali et al., 2013).

The proposed solution was to enable VHSL to improve operational efficiencies by streamlining business processes, automating routine tasks, ease in accessing staffs and their dependents' hospital records from other locations in emergencies and when needed as well as lowering costs related to providing healthcare for its clients. Additionally, expected benefits that the e-health project was to help realize included; accurate and secured data on patients and their transactions, generate timely reports for stakeholders and improve on the time taken to provide healthcare for patients with 95% system availability and provision of user friendly interface.

Eight years after the implementation however, there has not been any benefits assessment done to ascertain whether the project outcomes delivered the intended benefits to stakeholders. Among other things, there have been complaints from all the four locations about challenges with the system such as clients' inability to schedule laboratory and hospital

appointments in order to avoid going through the usual long queues and waiting times, continuous manual or paper-based activities, difficulties in retrieving patients data, inability to use the online functionality to submit queries and receive response, persistent congestion at the OPDs, low collaboration among clinicians and the anticipated improvement in the performance of duties.

The VRA management, based on the reported difficulties with the current system are contemplating on improving the system or replacing it with an entirely new solution. However, the management is not able to clearly determine whether they have achieved the expected benefits. Taking a decision on the system without any empirical study or assessment to ascertain whether the expected outcomes for which the system was implemented were achieved, or failing to determine the factors which accounts for the stakeholders' failure to realize the expected benefits so far, would make it rather difficult to address the problems. Hence the need to conduct benefits realization assessment.

1.5 Objectives of Study

The main objective of the study is to evaluate the knowledge in BRM and perceived benefits of e-health solution implementation at VRA Health Services Limited (VHSL) health facilities.

1.5.1 Specific Objectives

The specific objectives of the study are:

1. To explore stakeholders' expectation of benefits of e-health solutions adoption.
2. To identify realised benefits from the EMR implementation.

3. To determine the factors accounting for benefits realization failures in e-health solution projects.

1.6 Research Questions

Question 1: What are the levels of knowledge and perception of stakeholders regarding e-health solutions implementation?

Question 2: What are the benefits realised from the e-health solution?

Question 3: What account for the stakeholders' failure to realize expected benefits from e-health solution projects?

1.7 Conceptual framework

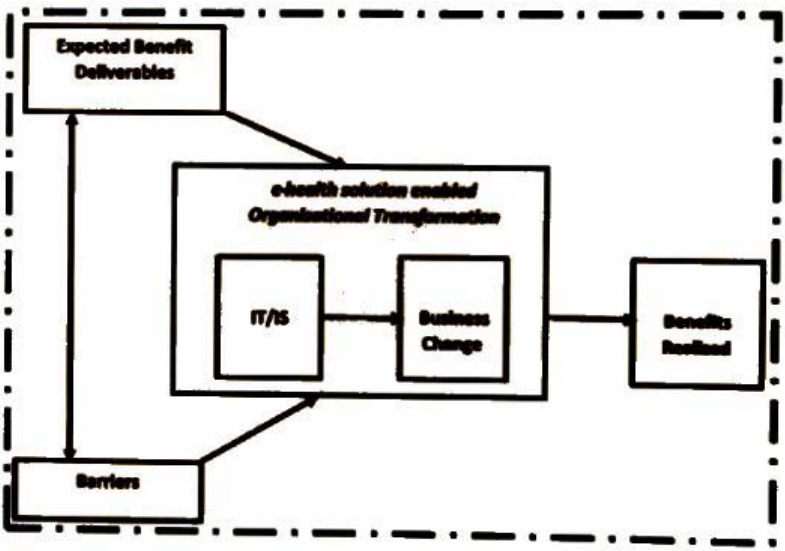

Figure 1.1: Linkages between e-health adoption barriers, benefits deliverables and benefit realization

Source: Coombs, 2014

1.8 Narration

For the benefits of e-Health solutions to be realized, the facility or organization must embrace an organizational transformation. This transformation involves Information Technology and Information Systems (IT/IS) and changes in the business processes. IT/IS transformation may result from improvement in legacy systems or introduction of new technologies. Business change on the other can hand involve structural, strategic, management, operational and/or functional changes. Barriers are inhibitors or challenges to the organization or the adopted e-Health solution that influence the realization of benefits from the implemented solution or organizational transformation. Expected benefit deliverables are the enablers necessitating the adoption of the proposed transformation.

1.9 Significance of the study

Volta River Authority's (VRA) will find the findings from this study useful as the results will provide empirical data for management to take decision on the future of the implemented EMR. Other health facilities and institutions seeking to implement similar solutions will find the study relevant as the findings can serve as reference in their appraisal of such technological solutions. The Ministry of Health and the Ghana Health Services will find the study useful in their e-health drive.

On the academic front, the study will provide background information for future researchers on the subject matter.

1.10 Disposition of Practicum report

The study has six chapters. Chapter one provides the background of the study and introduces the area in which the study is conducted, and then detailing the specific problem. Effort is also made here to demonstrate the originality of, and motivation behind the study. Chapter two focuses on published literature relating to the subject matter. Chapter three focuses on how the research questions from chapter one were answered. The chapter also present, discuss and justify the methodology in terms of research design, sampling and sampling techniques, as well as data collection procedure. In chapter four, analysis is carried out on the data collected, whiles chapter five provides discussion of the results. The study concludes with chapter six, which focuses on the summary, recommendations and conclusion of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter focuses on published literature related to the area of study and research problem. The goals of this review are to "demonstrate a familiarity with the body of knowledge in the study area and to establish their credibility, as well as to show the path of prior research and how the study is connected to them. It is also to integrate and summarize what is known in this area, and to learn from others and stimulate new ideas" (Newman, 2009).

2.1 IS/IT Implementation Challenge

e-Health solutions like many other IS/IT artifacts have become essential product or tool allowing healthcare providers to achieve greater efficiency of operations, increased agility in responding to patients' needs, and the ability to develop innovative ways of providing services. Governments and organizations continue to prioritize substantial budgets and investments into e-Health solutions and other IT infrastructure. However, despite the consensus about the strategic importance of IS and IT and the considerable investments that organizations continue to make in their purchase and implementation, the realization of benefits remains challenging (Ward and Daniel, 2012). Many of these projects and programmes have been abandoned at various stages of the implementation whiles some that are able to go through the implementation life-cycle have failed to deliver the proposed or intended benefits.

The PMI (2016c) mentions that for every investment of $1 billion USD an average of $122 million USD is wasted in poor projects. Again, only 50% of all projects meet the original business intent and even fewer reach their budget and schedule goals (PMI, 2017).

Previous studies have identified two areas that organizations tend to encounter the most difficult challenges. These are the development of an effective business strategy and the delivery of benefits from Information Systems investment. (Ward & Peppard, 2002; Ward and Daniel, 2012; Musawir et al., 2017). Investments into IS/IT is not the panacea for turning around the fortunes of any organization.

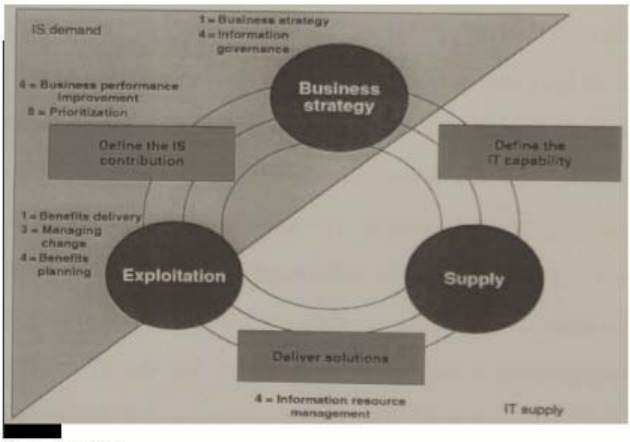

Figure 2.1: IS Competences common areas of weakness
Source: Ward and Peppard, 2002

2.2 Challenges to e-Health Solutions Adoption

e-Health Solutions hold great promise, with increasing number of providers recognizing that e-Health solutions are becoming essential for providing high-quality healthcare services. Yet

there are still challenges to their adoption (Amatayakul, 2013). Anticipating these challenges early in the adoption cycle helps overcome them or at least reduces their intensity (Aitken, 2003).

Challenges to any change are many and varied (Bocij et al., 2006). They also may be real or perceived or a combination (Serra & Kunc, 2015). Many of the early stages to e-Health solutions were real (Amatayakul, 2013). Design limitations and complications for instance were identified as very real challenges, and the efforts to overcome them were likewise real. According to Amatayakul (2013) as well as Burke and Weill (2018) there still issues and challenges with regards to design, however the current level of sophistication of e-Health solutions such as EHR, has increased significantly. The challenges to e-Health solutions adoption have been particularly strong due to the high stakes and the fact that the change they bring about is often great. e-Health solutions like many IS/IT implementations can be highly sophisticated. These make the anticipated benefits rather great. When these benefits are not achieved, or are not perceived to be achieved, the disappointment is immense and can easily cast doubt for any future endeavors (Amatayakul, 2013). Previous studies have identified several issues and challenges that hinders the successful adoption of e-health solutions. Though legal issues, especially with respect to admissibility of records compiled electronically and their authentication might be jurisdictional, they happen to be one of the main concerns in the early adoption of e-Health solutions (Amatayakul, 2013). Nohr and Aarts (2010) concluded that leading issues including clinical resistance, privacy and security, patient and consumer use, management commitment and business challenges continue to be major threats to e-Health solutions implementation and adoption.

2.3 The Foundation and Founding Principles of Benefits Management

Over the past three decades, for the success rate of IS/IT projects and programmes to be improved, a plethora of methodologies and processes have been developed, yet the total success rate of investments still hovers around 30% (Ward and Peppard, 2002). Projects and programmes can only be successful if the intended benefits are realized. In many instances, the success of capital projects and programmes are measured in relation to the "traditional project-appraisal triad" of cost, quality and time of delivery, and not in relation to the benefits or impact that they have delivered (Sapountzis et al., 2008). Many IT project managers have misconstrued a 'successful' project to mean a project that delivered 'what' it was intended to deliver, 'when' it was said would deliver it, and for the 'cost' it was budgeted for. In fact, many (IT internal) project managers would regard 'success' as delivering just the core functionality (by and large) on the planned delivery date (by and large), at undetermined final cost (Aitken, 2003). Zwikael and Smyrk (2019) reiterate that the success of any process can be judged by evaluating the performance of the process.

A common characteristic of many unsuccessful projects is how vague the expected benefits are defined (Reiss, 2006). Projects and programmes are determined by specific benefit through structured change. Ward and Daniel (2012) identified that current investments made today are more varied, complex and pervasive than in the past and often have a more significant impact on the business and organizational performance. They concluded that the lack of improvement that existing methodologies and processes are insufficient and new approaches are needed if the success rate is to improve (Ward & Daniel, 2012).

Benefits management and realization has risen in recent times to move away from the traditional investment appraisal approach and focus on how to actively plan the realization

and measurement of benefits (Glynne, 2007). The new method of managing IS/IT investments is by the benefits management process which enables organizations to effectively use already existing processes at their disposal, to generate the competencies required by organizations to find available benefits from their IS/IT investments (Ward & Daniel, 2006). Several reasons, including the fact that benefits rarely occur when and where they are planned, differences in immediate results of an investment and expected benefits, the lack of organizational capacity to manage change as well as the fact that important means for BR are not identified among others Traux (1997), Lin & Pervin (2003) and Sapountzis et al. (2008).

Three component competences involved in IT exploitation were identified by Bradley (2010), and these were later explained as benefits planning, change management and benefits realization (Ward & Daniel, 2017). These are essentially business-based competences, therefore improving them will mean changing how IT specialists, business managers and users work together (Ward & Peppard, 2002). Bartlett (2006) agrees that the lack of benefits management is often a root cause of programme failures, but equally damaging is poor benefits management, that attempts to manage benefits, without recognition of the contributors to success. The task, is therefore, complex, and demands a wide span of control. The inability to deliver benefits reduces the organizational understanding of the business value that IT can provide, which leads to an inability to make consistent or appropriate investment choices or set priorities (Ward & Daniel, 2012). The outcome turns to limit an organization's ability to identify how IT can best be used to improve performance or support new strategic developments. As a result, business strategy formulation often does not adequately include the consideration of opportunities available from new IT-based options

or threats arising from the deployment of IT by others in the industry (Ward & Daniel, 2017; 2012).

Ward and Daniel (2012) identified two founding principles of benefits management. One is that there are no direct benefits of Information Technology and the second is that things only get better when people start doing things differently. It's been explained that Information Technology only enables or creates the capability to derive benefits. Benefits therefore come from a new improved way of working (Ward & Peppard, 2002).

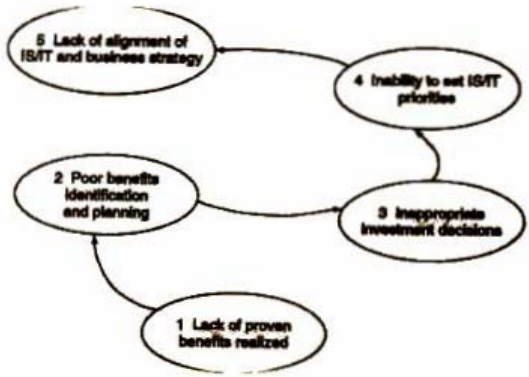

Figure 2.2: The implications of poor benefits management

Source: Ward & Daniel, 2012

2.4 Benefits and Benefits Realization Concepts

e-Health Solutions as a technology will not be able to realize its benefits by itself. Benefits management is described as "a management philosophy that puts the benefits at the central point for all the actors' activities in organisational change" (Badewi, 2015b; Badewi, 2015a).

Project success criteria are about identifying what exactly a project is expected to deliver and to enable (Musawir et al., 2017). Chittenden and Bon (2006) avers that projects have clearly defined outputs, delivered within a specific time frame. These deliverables comprise artefacts or products, results or services expected to enable positive changes to business objectives. The increment in value derived through the business transformation from the stakeholders' perspective is called benefit.

Different writers and researchers have given diverse definitions and explanations for the term 'benefit'. Zwikael and Smyrk (2019) defined benefit as the "flow of value to an entity (not necessarily the funder) arising from achievement of a target outcome". Musawir et al. (2017) defined benefits as "measurable and quantifiable improvements, which are normally expressed in financial terms, so they can justify any investment that may be required from the business". Ward and Peppard (2002) defined benefit as "an advantage on behalf of an individual or group of individuals". This means that in order to realize a benefit, stakeholders must have gained some advantage over their previous way of working. In other words, it's not the functionality of the system, but how users use that functionality to work in a better way. "A benefit is the measurable improvement resulting from an outcome which is perceived as an advantage by a stakeholder" (NSWG Part 3, 2018). Ward and Daniel (2006) explained benefits as the specific outcomes where accountability can be assigned, and measurement defined. Benefits are used for defining and declaring success of an investment and they are the net positive changes resulting from outcomes (Musawir et al., 2017; NSWG Part 3, 2018). Before defining and declaring outcomes as benefits, it is important to understand them (NSWG Part 3, 2018). Payne (2007) introduces definitions and established relations between the terminologies' 'outcome', 'benefit' and 'financial impact'. He

explained that outcome has two meanings depending on its context. At macro level, desired "outcomes are the strategic changes that a programme is designed to fulfil". At micro level, "outcomes are the changes to day-to-day operations that project outputs cause". Benefits are measurable improvements resulting from outcomes whereas financial impact is the improvement in business financial performance that results directly or indirectly, from achievement of one or more benefits (Sapountzis et al., 2008).

According to Zwikael and Smyrk (2019), the underlying purpose of a project is to generate specific "flows of value" to identified beneficiaries and the strength of the relationship between target outcomes and its desired benefits is peculiar to each project. In many projects and programmes, direct measurement of benefits is difficult and so surrogate variables are assembled which yield more readily to analytical methods. Musawir et al. (2017) equates these surrogate variables to the project's target outcomes. Clearly, it is important that a plausible causal relationship is established between the achievement of target outcomes and the desired "flows of value" to beneficiaries (Zwikael & Smyrk, 2019). Scholes et al. (2002) explained that good business strategies are those that deliver stakeholder value, which is the organization's long-term cash generation capability or the ability to provide value public services, in case of public sector organisations. These business strategies, according to Kaplan and Norton (2008) set targets of future value, also described as benefits, which are met by achieving strategic objectives. Since these objectives are measurable, the difference between the current situation and the target future situation sets the value gap, which is fulfilled by a portfolio of initiatives defined by the organisation in their strategic plan (Kaplan & Norton, 2008). Strategic initiatives usually fill the value gap by enabling new capabilities – or promoting changes – through the outputs delivered by a set of projects, as

illustrated in figure 2.3 below. In the early 1990s, the benefits from investment emerged as a new management idea from the unsatisfactory performance of IS/IT function and the shortfalls with the current evaluation mechanisms (Breese, 2012).

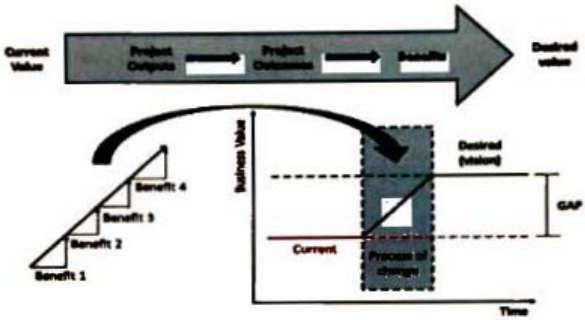

Figure 2.3: Filling the value gap

Source: Serra, C. E. M., & Kunc, M. (2015)

Following this, three terminologies, benefits realization, benefits realization management and benefits management have been used in various literature and documentations from academic, professional bodies, government and consultants with similar definitions or sometimes interchangeably.

Benefits realization concept is not new (Simon, 2003; Nogeste & Walker, 2006). In addition, a survey from 1990 raised the awareness of the links between project and benefit management and found that the "number one' cause of information system/information technology (IS/IT) project is "the vague statement of benefits, leading to an uncertain allocation of responsibility for managing their delivery (Lin & Pervan, 2003). It has been

recognized that, if an organization is investing a lot of money into a new system they want to ensure and see the benefits that they get from the investments. This they defined as the process of organizing and managing, such that the potential benefits arising from the use of IT are realized. Determining the value of benefits enables organizations to identify, prioritize, and support their most relevant initiatives, as well as to evaluate whether they are successful or not (Musawir et al., 2017).

According to Traux (1997), there has been paradigm shift in the view of benefits, and it is therefore needed to change the management from passively manage the benefits to a proactive manage benefits.

Table 2.1: Paradigm shift for benefits realization

Traditional Benefits Realisation Principles	New Benefits Realisation
Benefits are stable over time	The potential benefits from an investment change over time
The investment determines the nature and scope of benefits	The organization and its business context determine the benefits
Financial returns represent the most valid justification for an investment	All the outcomes of an investment represent the potential sources of value
It is sufficient to manage the investment to generate the benefits	The organization must be proactive in realizing benefits

Source: Traux, 1997

Effective management of IT implementation and proficient use of its capabilities are becoming increasingly integral to improving business performance. It is therefore essential that business managers are not only responsible for deciding on IS/IT projects and priorities, but also for the delivery of the benefits (Serra & Kunc, 2015). Bartlett (2006) identified that in many organisations and public sector programmes and projects failure to identify and achieve planned benefits through change initiatives appears to be common.

2.5 Benefits Realization Management

The terms 'benefits management' and 'benefits realization management' have often been used interchangeably. Benefits Management, often defined as the 'process of organising and managing such that the potential benefits arising from the use of IS/IT are actually realised' was first introduced in an IT setting (Ward and Daniel, 2006/2012).. Benefits accrued as a result of the successful changes, fill the value gap, which is the difference between the current situation and the target future situation expected in the strategic plan (Kaplan & Norton, 2008).

Serra and Kunc (2015) assert that assessing and measuring the benefits, and ultimately realising how valuable a project is, belongs to the realm of Benefit Realisation Management (BRM). Musawir et al. (2017) later concluded that benefits realization is therefore a process to make benefits happen and to make people fully aware of them throughout the entire process of realization in order to ensure the creation of strategic and measurable value to the business.

Several definitions, notwithstanding the similarities between them have been given to Benefits Management (BM) and Benefits Realisation Management (BRM). Bradley (2006/2010) defined BRM as the process of organizing and managing, so that potential benefits, arising from investment in change, are actually achieved. The NSWG 2018 report defined BRM as process of identifying, planning, managing and evaluating the intended benefits of an investment whiles

BRM is defined as the set of processes which are formulated for filling the gap between planning and executing strategy, also ensuring that valuable initiatives are implemented by Glynne (2007). Reiss (2006) defined BRM as a process for the optimization or maximization

of benefits from change programmes. Ward and Daniel (2006) suggests that BRM informs investment decisions and establishes plans to realize intended benefits, whiles Zwikael & Smyrk (2011) defined benefits realization as a process to make benefits happen and also do make people fully aware of them throughout the entire process. The process consists of defining, agreeing, measuring and reporting on the expected benefits (Sapountzis et. al., 2008). According to the Office of Government Commerce (OCG, 2003), BRM ensures that business change achieves the expected results by translating business objectives into identifiable measurable benefits that can be systematically tracked.

Benefits realization usually refers to either the full benefits lifecycle or to a specific stage/phase towards the latter end of the wider life-cycle process of benefit management or benefit realization management. BRM is a key part of governance, since it supports the strategic creation of value and provides the correct level of prioritization and executive support to the correct initiatives (Musawir et al., 2017). Breese (2012) stated that BRM is often presented by industry and project managers as a key set of practices for strategy execution that are instrumental in enabling effective project portfolio governance and strategic project success. Realization of particular benefit through structural change helps in driving the programs and projects. BRM has given the new emerging practice that supported shift from traditional investment approach to focused active planning of benefits realization (Musawir et al., 2017). Therefore, BRM has increased its importance last few years and it is a valuable approach, which should be promoted and supported by the organizations' top management and to design a strategy to accomplishment of maximum benefits (OGC, 2007). It has become the crucial element for organizations for gaining the competitive edge on their competitors.

The benefit realization is described as the process that understands the benefits which are reached and managed by unexpected few (Farbey, Land & Targett, 1999). Another definition was produced by Bradley (2006), who states that "the method of arranging and organizing, in a way that likely benefits resulting from banking in revolution, which is attained in actual".

2.6 Benefits Realization Management Frameworks

Since Leyton (1995), Ward et al. (1996), Thorp (2003), Ashurst and Doherty (2003), OGC (2004) Bradley (2006), Reiss et al. (2006) up to the New South Wales Government (2018), researchers and practitioners have developed several frameworks, models or approaches to evaluating Benefits Realization Management (BRM) from different perspectives, albeit some of them arising from same principles and processes have come up. The New South Wales Government (NSWG) BRM framework, the OGC Gateway Process, the Cranfield School of Management's BRM frameworks and Input-Transform-Output (ITO) model developed by Zwikael & Smyrk (2019) appear to have now been adopted by many researchers across wider organizations in the benefits realization management. According to the OGC (2007), the NSWG (2018), Ward and Daniel (2012), Serra and Kunc (2015), the purpose of a BRM Framework is to provide:

- a framework of best practice principles and concepts drawn from latest experiences and proven practice in setting up and managing programs that is transferable across an organization and its agencies
- a benefits realisation management must have a standard approach for those not familiar with the subject matter, such as program directors and managers, change

managers, project managers, business analysts and program management office (PMO) staff across the organization

- consistent terminology and benefits categorization
- introduction and guidance for program sponsors and business benefit owners

2.6.1 The New South Wales Government (NSWG) BRM framework

The NSWG (2018) defines BRM framework as "a standard approach for benefits realisation management for anyone not familiar with the subject matter, including program directors and managers, change managers, project managers, business analysts and program management office (PMO) staff across an organization".

The framework structure involves five stages or parts, namely; Principles, Process, Guidelines, Implementation and Glossary. The purpose and aim of each of the parts are clearly outlined.

2.6.1.1 BRM Framework - Part 1

Principles outline ten principles on the rationale that, investments are made because of Benefits, and that Benefit Management begins with defining the problem, business changes and the proposed outcomes (NSWG Part 1, 2018).

2.6.1.2 BRM Framework - Part 2

Process stage involves four phases, namely Understand, Plan, Manage and Report and Evaluate. This is similar to the traditional Plan-Do-Study-Act (PDSA) cycles and model for "testing out changes on a small scale, building on the learning from these test cycles in a structured way before wholesale implementation" (NSWG Part 2,2018).

2.6.1.3 BRM Framework - Part 3

The purpose of the BRM Framework Part 3 named Guidelines, introduces benefits management practice to assist program management practitioners in the implementation of a benefits process (NSWG Part 3, 2018). The outline of Guidelines of BRM requires three strategic and integrated characteristics in place for successful operation (Table 2.3).

The Guidelines provide a structured approach for agencies to manage and demonstrate the realisation of benefits from change programs (Musawir et al., 2017).

Table 2.2: New South Wales Government BRM Framework Part 3

Characteristics	Critical Success Factors
Stakeholder Buy-In	• Senior management leadership and commitment • Active stakeholder participation • Operational ownership of benefits
Management of Information	• BRM profiles, plans and tracking registers up to date • Data is available from digital services by default • Alignment with business forecasting/budgeting and actual performance • Alignment with project/program management and evaluation systems
Embedded BRM	• Alignment of benefits to strategic objectives • Governing bodies maintain a benefits management focus • Monitoring and evaluation processes embedded into organisation • Integration with program, change management and program evaluation

Source; Data derived from New South Wales Government BRM Framework Part 3

2.6.1.4 BRM Framework - Part 4

BRM framework Part 4 outlines the Implementation phase. The phase gives information on how to adapt the deliverables and techniques outlined in purpose (Part 2), guidelines (Part 3) and templates provided in the glossary (Part 5) to meet stakeholder needs. The phase also provides details of considerations that should be undertaken before starting, analysis that

will help in implementing plans and recommendations for benefits management deliverables that should be adopted. It describes the Benefits Management Maturity as well as the various assessment models including the P3M3 Portfolio, Program, Project Management Maturity Model, Managing Benefits Health-check Assessment, Digital Service Standard, NSW Digital Strategy – Digital standard

2.6.1.5 BRM Framework - Part 5

The phase 5 is the glossary containing all the documentations including terminologies and acronym, references, literature and templates used in the NSW Government BRM framework.

2.6.2 The OGC Gateway Process

The Office of Government Commerce (OGC) an independent Office of the UK Treasury, works with public sector organisations to assist them improve their efficiency, derive better value for money from their commercial activities and improved projects delivery (Pellegrinelli et al., 2007). Managing Successful Programmes (MSP) a publication by OGC (2003) highlighted programme management principles and techniques developed and applied over the years by the UK Government (Sapountzis et al., 2008). According to Pellegrinelli et al. (2007) the approved model for projects management in all public sector within the UK is the MSP. The MSP identifies benefits management as "a core activity and a continuous thread throughout the project" (OGC, 2007a). It also fundamental to benefits realization from new capabilities delivered by projects within the project.

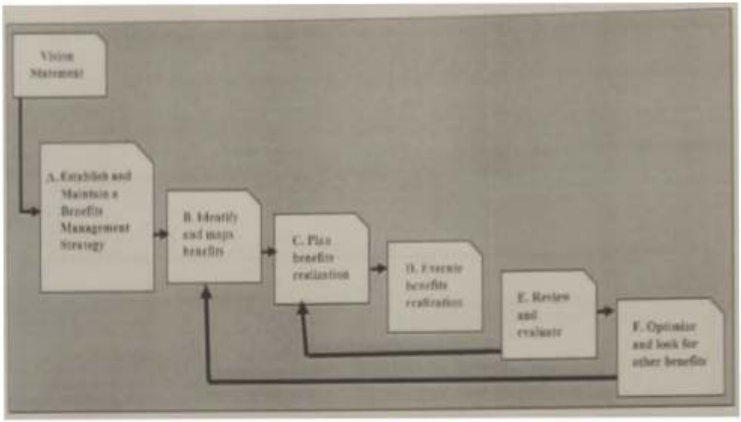

Figure 2.4: Benefits Management Process
Source: OGC, 2007a, Bradley, 2006)

2.6.3 Cranfield School of Management BRM framework

The Cranfield process model (CPM) was developed by Ward and colleagues in 1996. The CPM argues that benefits management is a continuous process and it should not be imposed via single projects (Badewi, 2015). The CPM approach to managing projects focus is firmly on identifying and then delivering business benefits through organisational change. The purpose of the benefits management process is to improve the identification of achievable benefits and to ensure that decisions and actions taken over the life of the investment lead to realizing all the feasible benefits (Ward & Daniel, 2012). Indeed, benefits management is a management philosophy that puts the benefits at the central point for all the actors' activities in organisational change (Badewi, 2015b; Badewi, 2015a).

According to Ward and Daniel (2006), the framework considers the expected values to be derived, based on which strategy is formulated for its understanding. It is then executed, and

the outcomes are studied and appraised. Ward, Murray and David (1997) had in an earlier study underscored that this model explaining a process served as foundation for providing guidelines pertaining to the best practices for the benefits management. The key elements and relationships in the CPM are as illustrated in figure 2.5.

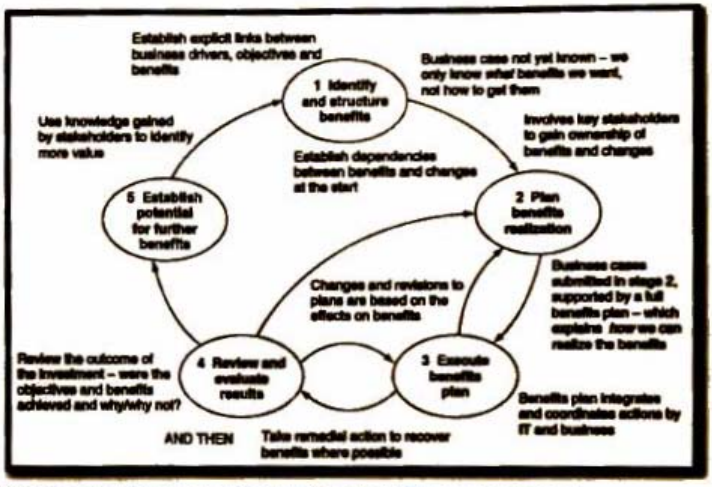

Figure 2.5: Stages and main activities of the benefits management process
Source: Ward & Daniel, 2006

The introduction of benefits realization in IT was "not to make good forecasts but to make them come true ... and IS/IT on its own does not deliver benefits." (Ward et al., 1996). Benefits monitoring is another important feature of this Cranfield model where project results are compared with the benefits realisation plan during the project and assessment done to ascertain if there have been any changes either internal or external that will have effect on the delivery of planned benefits (Sapountzis et al., 2008). The model consists of five main stages (Ward & Daniel, 2006; NSWG, 2018). It starts by benefit identification

where "potential benefits are determined and aligned with organisational strategy". Next, the planning benefits stage "allows planners to work out how to realise these benefits through integrating, IT within organisstional change". Executing the benefit plan is "the stage when the IT is put into action through an organisational change process". For quality assurance of the implementation, a Benefit Review is periodically conducted. Last, the Benefit Exploitation stage allows organisations to obtain more benefits from IT applications. The benefits plan drives the organisational change plan, which drives the technical system requirements. Ward and Daniel (2006).

2.6.4 The Input-Transform-Outcomes (ITO) Model

Smyrk (1995) identified a shortcoming in the traditional Input-Process-Output (IPO) model as representation of project because it makes no mention of target outcomes or benefits. To address the issue, two elements (utilization and target outcomes) were introduced or added to the three that are already included (inputs, process and outputs) by Zwikael & Smyrk (2019) to produce the Input-Transform-Outcomes (ITO) model.

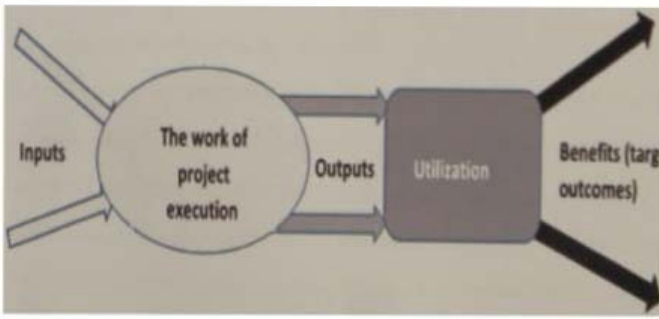

Figure 2.6: The ITO Model of a Project

Adapted from Zwikael & Smyrk (2019). Project Management: A Benefit Realisation Approach

In this model, the project's outputs are eventually delivered to someone who then utilizes them in a way that subsequently contributes to the generation of expected benefits or target outcomes. The In the left-hand (IPO) part of the ITO model, there is 'strong causality' between the work of the project and its outputs. This means not only that the outputs can exist only if the process is executed, but also that, if the process is executed, the outputs will be created. In contrast, the right-hand part of ITO model (figure 2.6), the link between outputs and target outcomes is an example of 'weak causality' whereby the delivery of outputs does not guarantee the generation of target outcomes.

2.7 Benefits Classification

Classifying benefits according to Bradley (2006) "increases the understanding of the nature of benefits and will assist analysis and communication". Farbey et al. (1999), Nogeste and Walker (2005), Bradley (2006), Ward and Daniel (2012), Musawir et al., (2017) and a host of other Authors classify benefits based on the value type and by the organizational and business impact.

2.7.1 Benefits classification by value type

The most widely used distinction for benefits is between tangible and intangible. According to Ward & Daniel (2012), tangible benefits are those that can be measured by an objective, quantitative and often financial measure. In some cases, it may be that a benefit has a quantitative measure but is not financial. Intangible benefits are those that can only be judged subjectively and tend to employ qualitative measures. Nogeste and Walker (2005), explains tangible outcome as one that has been operationalised and can be measured, monitored and

controlled, and intangible outcomes, as being operationalised on high to low perception scales.

Table 2.3: Benefit Value Types

			Cashable	Non-cashable
Tangible	Definite	Value may be predicted with certainty	Reduced Costs	Fewer Steps in a process
	Expected	Value may be predicted on the basis of historic trends and high levels of confidence	Increased Sales	Quicker performance of tasks
	Anticipated	The benefit is anticipated but is value is not reliably predictable	Lower insurance premiums	Greater Customer Satisfaction
Intangible		Maybe anticipated but difficult to substantiate. Proxy measurement of other casually-related benefits may give evidence of realisation	Improved image (proxy: increased number of positive testimonials)	

Source: Bradley, 2006

The terms 'hard' and 'soft' are often used in distinguishing tangible and intangible benefits. Philips, Whynes and Avis (2006) defined soft benefits as "the expected benefits that cannot be expressed in terms of their likely impact on the balance sheet or the profit and loss account". These are termed intangible, and benefits that can be expressed and have tangible financial outcome are usually referred to as hard or tangible (Sapountzis et al., 2008.). Philips (2003) defined hard benefits as "representing the output, quality, cost and time of work-related processes". They are objective, relatively easy to measure and convert to money values. In terms of their financial impact there is the classification of benefits as 'direct or 'indirect' (Sapountzis et al., 2008).

2.7.2 Benefits classification by Organizational and Business impact

Ward and Daniel (2006) also classified generic benefits as alignment of the main elements of the organization with benefits. According to Farbey et al. (1993), this classification is

associated with tangible benefits and facilitates ways in which benefits can be categorized and understood by five business streams, namely; Strategic, Management, Operational, Functional and Support. This categorization (figure 2.7) is underpinned by Mintzberg's (1983) view of the structure of an organization. Ward and Daniel (2012) in their study explained Mintzberg's framework as "people-centric" view of the organization, a valuable initial point to consider in the increase in benefits from the use of IS/IT.

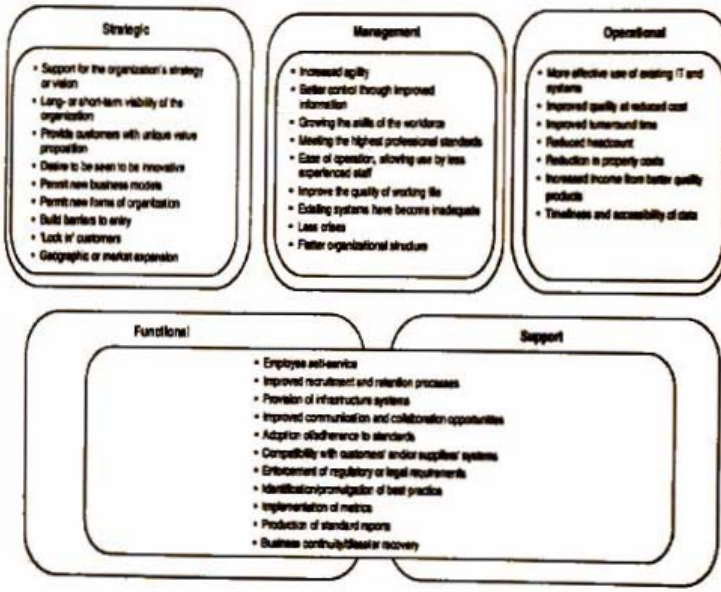

Figure 2.7: Generic form of benefits arising from IS/IT (after Farley et. All, 1999)
Source: Ward, J. & Daniel, L. 2006. Benefits Management: Delivering Value from IS & IT Investments

Bradley (2006) explained that in examining strategy alignment, balance and comparing the relative significance of benefits it is important to classify benefits by either business or organizational impact. He argued that classification type should be within three main strategic improvement areas of productivity; risk minimization and growth. Mintzberg's five elements of organization is summarized by Ward and Daniel (2006) in Table 2.4 below.

Table 2.4: The five elements of an organization

Organizational Structure Element	Description
Strategic	Includes people charged with overall responsibility for the organization's direction
Management	Includes middle managers who operate in order to transform the strategic vision into operational reality
Operational	Refers to people who perform work related directly to the production of products and services
Functional	Includes people who serve the organization by affecting others' work
Support	Includes people who provide support for the organization outside the basic production of goods or services. These are often specialists in certain disciplines

Source: Ward and Daniel (2006), after Farbey et al., 1993

Another classification described by Sapountzis et al., (2008) as subcategory under the organizational and business impact is the Cranfield Grid or Boston Matrix used in analyzing impact on portfolio of investments. This was adopted by Bradley (2006) in the BRM approach to analyze the impacts of the set of impacts for a single investment.

Table 2.5: Benefits classification by business impact using the Cranfield Grid / Boston Matrix

Sources: Bradley, 2006; OGC, 2007a

2.7.3 Unplanned or Emergent Benefits

Unplanned or emergent benefits are those benefits that were not anticipated (i.e. emergent) but may be realised as "side benefits. These are often a consequence of a change implemented or another benefit gained and must be included during any kind of assessment of performance on an organization (Sapountzis et al., (2008)). According to Ashurst and Doherty (2003), incidental impacts should also be identified and proactively managed. Many studies (Farbey et al, 1999; Bradley, 2006; Ward & Daniel, 2012; Serra & Kunc, 2015) have identified that, apart from anticipated outcomes, projects gave rise to unplanned or emergent benefits.

2.8 Benefits Management Tools and Techniques

Based on the approaches and models developed, there is a compilation of list of tools and techniques by identifying the common areas between the various approaches and their

importance in the benefits realization management implementation phase (Sapountzis et al., (2008). The aim of a Benefit tool is to support an organization in assessing the cumulative benefits impact of an idea, activity or project (Melton et al, 2008). Reiss (2006) argued that there must be a tool to measure the benefits and procedures for mentoring, reporting and responding to outcomes in order to conclude that benefits do not just happen by mere delivering of projects.

2.8.1 Benefits Identification

The benefits expected from the investment in the new or improved use IT artifact can be determined based on the outcome of the strategic analysis and planning activities of the proposed solution. The purpose of the benefits identification phase, according to Ward & Daniel, 2006) may vary. The benefits identification consists of combination of interviews and workshops that involves major stakeholders with an important aspect being stakeholders learning to understand the requirement of an investment and what is affordable and possible (Bennington and Baccarini, 2004).

DeLone and McLean (2004) suggest that evaluation of a system can be done in terms of information, system, and service quality; affecting the subsequent use or intention to use and user satisfaction. Certain benefits will be realized as a result of using the system with the net benefits (positively or negatively) being the influence of user satisfaction and further use of the information system (Figure. 2.8).

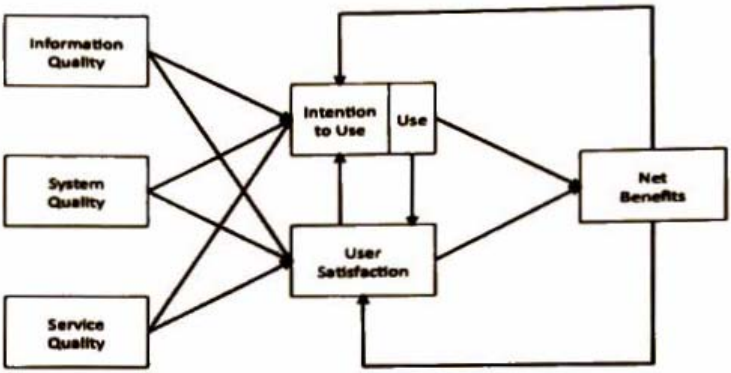

Figure 2.8: DeLone and McLean IS success model

2.8.2 Benefits Profile

The NSWG (2018) defined a benefits profile as "a template that contains a description of a single benefit, including all its attributes and dependencies as well as measures and estimated value". A benefit profile supports good governance and enables stakeholders and benefit holders to appraise all the attributes (Ward & Daniel, 2012; Musawir et al., 2017). Many researchers have recommended the drawing of merits and demerits of benefit profiles so they can be urgently managed (Thorp, 2003, Farbey et al., 1999; Bradley, 2006; Ward & Daniel 2006). The responsibility of target measure approval and achievable improvement depends on the benefit owner. Benefits profiles, according to the various BRM frameworks, (OGC, 2007b, NSWG, 2018, Sapountzis et al, 2008, Ward & Daniel, 2012, Musawir et al., (2017) should include but limited to:

- Unit of measure
- Method of measurement

- Benefit Cost Ratio (BCR)
- Benefit calculation method
- Data source
- Baseline measurement
- Improvement timescale
- Beneficiary of the expected improvement
- Approved by benefit owners

2.8.3 Benefits Realization Approach & Strategy

Many Authors (Ward & Daniel, 2006; Bradley, 2006; Reiss, 2006; Serra & Kunc, 2015) have all emphasized that benefits from IS/IT projects is not by chance and that it is not enough to improve the existing processes and methodologies, which is not central in addressing managing the benefits. Ward & Daniel (2012) explained that the first most important step is to have new processes, tools and techniques. The benefits realization strategy (BRS) aligns benefits to the organization's strategy (Musawir et al., 2017). It describes the end goal and the direction of the establishment (Ward & Daniel, 2012). The NSWG (2018) underlines the importance of drawing a benefit realisation strategy which is a useful document for communicating expectations and addressing the impact of unexpected changes, both internal and external (OGC, 2007). According to Ward et al (2006), it is challenging to envisage how an institution could realize business benefits without a strategy. A BRS generally includes "a benefits map that provides a clear linkage between outcomes, objectives, end benefits, intermediate benefits, business changes, enablers and dis-benefits" (NSWG, 2018).

2.8.4 Three – Column Analysis

The three-column analysis is a useful tool designed by the New South Wales Government project working group (NSWG, 2018), to assist project stakeholders comprehend and agree to what is the business case, what has to change or what needed to be stopped. and to start to identify benefits, consist of a three-column analysis (figure. 2.9). The technique involves devising responses to all the four sections.

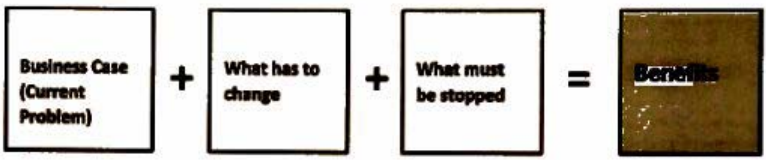

Figure 2.9: Three-column analysis for benefits realization

Adapted from NSWG (2018)

2.8.5 Benefits Dependency Network and Mapping (Benefit Map)

The benefits dependency network, also referred to as benefits map or the benefits dependency map first introduced by Ward and Elvin in 1999. Sapountzis et al. (2008) aims to illustrate the many-to-many relationships between enabling changes, business changes, business benefits and investments objectives is the key working document. The benefits dependency network is initiative-specific and describes a path to the successful realisation of these strategic objectives (OGC, 2007). According to Bradley (2006) a benefits dependency network "maps all the cause and effect relationships to include stakeholders, changes and criteria for success". Although the strategic objectives might be measurable, it is sometimes impossible to determine if the strategic goal achieved is due to an initiative or to factors outside of the scope of the initiative (Jevtic, 2016). The measured benefits are more directly related to the initiative implementation.

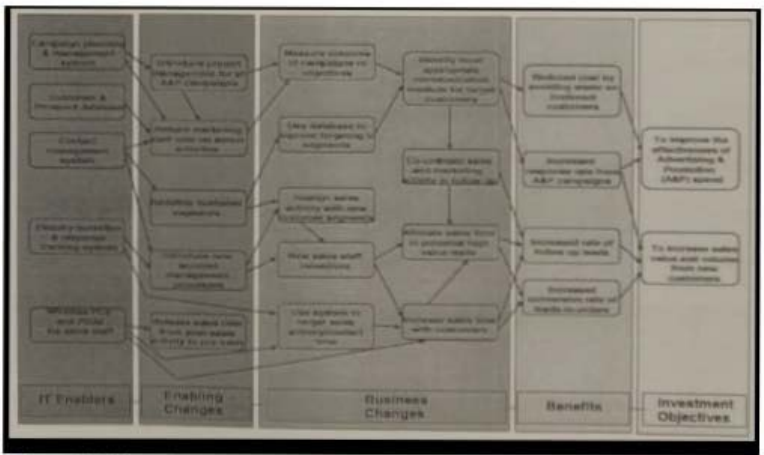

Figure 2.10: Managing the Realization of Business Benefits from IT Investments
MIS Quarterly Executive, March 2007. Peppard, Ward, Daniels (2007)

2.8.6 Benefits Monitoring, Review and Evaluation

Bartlett (2006) explained that benefits monitoring starts with benefits planning and ends with benefits realization. Sapountzis et al. (2008) explained that benefits monitoring compares project results with the benefits realisation plan and assesses for any internal or external changes that will have effect on the delivery of desired benefits. The result of prolonged period benefits planning are often what business projects outline (Bartlett, 2006). For reasons such as inexperience, lack of business awareness, lack of focus on the people who will enjoy the benefits, insulation from the benefits that come from when business management is responsible for users, focus on managing the deliverables rather than the benefits, etc., most organisations do not monitor the benefits(Bennington and Baccarini, 2004). Ward and Griffiths (1996) however argued that organisations have to overcome and handle difficulties vigorously in order to monitor benefits. Cooke-Davies (2002) and Nogeste and Walker (2006) concluded that a successful benefits management cycle needs to include periodic reviews to reconfirm the alignment of the project portfolio with the organizations strategic priorities and whether or not the targeted benefits are sufficient to accomplish to organization's strategic goals by also contacting benefits reviews at project stage gates.

Ashurst and Doherty (2003) described benefits review as "the process by which the success of the project in terms of benefit delivery is addressed; opportunity for the realisation of further benefits are identified; and lessons learned opportunities for improvement in future projects are identified."

Benefit evaluation and value generation is described as one of the principle components of benefits management. (Bradley, 2006, Ward & Daniel, 2012). The evaluation phase is also seen as the final phase of the benefits realisation management (NSWG Part 4, 2018). The

evaluation is done in consultation with benefits owners and stakeholders (Serra and Kunc, 2015). Many Authors (Bradley, 2006, Ward and Daniel, 2006, Reiss et al., 2006, OCG, 2007, Ashurst & Doherty, 2003, NSWG Part, 2018) have suggested various techniques for evaluating benefits. These include; the traditional cost benefit analysis, value acceleration, value linking, value restructuring and innovation evaluation.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter outlines the details of the methodological considerations employed in the collection of the required data for the study. It describes the type of study, research design, sample size, population and the details of the processes that were used. The tools and techniques used for the data collection and processing, as well as the dissemination of results are clearly explained.

3.1 Research Design

The study adopted a descriptive case study design, using a quantitative data collection method. Quantitative research is an approach for testing objective "theories" by examining relationships among variables (Creswell & Creswell, 2018). The variables, in turn, can be measured, typically on instruments so that numbered data can be analyzed using statistical procedures (Neuman, 2009). Quantitative studies emphasize the measurement and analysis of causal relationships between variables, not processes (Denzin & Lincoln, 2000).

This method is deemed appropriate as it best describes the variables of the study group, to ensure that the study objectives would be met.

The research purpose adopted for this study is exploratory as it sought to evaluate the benefits realized by stakeholders at the VRA hospitals Limited, from the implemented e-Health solutions and identifying the factors accounting for why expected benefits are not realized. This is in light of heavy investments and budgetary allocation being made into IS/IT

infrastructure in the health services department over the past years, whiles the expected benefits remain difficult to quantify or measured by users and managers of the solution.

3.2 Research Approach

A research approach can either be qualitative or quantitative or a mixture of the two (Sullivan, 2001).

This study adopted quantitative method, with a descriptive case study and documents review. Descriptive research designs help answer questions of who, what, where, when and how related to the research problem (Creswell & Creswell, 2018). Pure quantitative research relies on the collection of quantitative data (i.e. numerical data) and follows the other characteristics of the quantitative research paradigm (Johnson & Christensen, 2014). The Study collected and analyzed only numerical data.

3.3 Study Area

The study area was the Volta River Authority Health Services Limited (VHSL). It is a wholly owned strategic business unit (SBU) of the Volta River Authority (VRA) made up of the Hospital Services and Public Health Sections. These sections have the responsibility of providing medical and other health needs to the Authority at large and the populace around the Volta Basin, and the catchment areas where the Authority operates. VHSL has hospitals located at Akosombo and Aboadze and Clinics in Accra and Akuse. The two hospitals (Akosombo and Aboadze) provide extensive clinical services, including Outpatient Care, Surgery, Dental Care, Pharmacy, Reproductive and Child Health Care, Orthopaedic,

Obstetrics and Gynaecology, Diagnostic Imaging (X-Ray, Ultrasound Scanning etc.) Eye Care, Ambulance Service and Mortuary Service.

3.4 Study Population

The population for this study consisted of both clinicians and non-clinician staff, from ten departments within the five work locations of the Authority. Departments were selected based on the staff strength of the department. Only departments with staff strength of ten or more were enrolled for the study. Fifteen (15) participants who played various roles in the implementation, support and oversight or supervisory were selected as a sub-sample to address the third objective of the study.

VRA Health Services Limited (VHSL), Hydro Generation Department (HGD), Thermal Generation Department (TGD), Procurement Department (PRD), Engineering Services Department (ESD), VRA Academy (VAD), Management Information System (MIS), Finance Department (FND), Technical Services Department (TSD) and Human Resources Department (HRD). The staff from these departments consist of Engineers, Doctors, Nurses, Pharmacists, Administrators, Procurement Officers, Department heads (Directors), Accountants, Technicians, Public Health Officers, and IT staff, who are all either regular users, part of the project implementation team or technical support staff.

3.5 Inclusion and Exclusion Criteria

The criteria for inclusion were people who use the system for their routine tasks or staff who have interacted with the system for at least one year after the its implementation and belong to a VRA department with staff strength of Ten (10) or more. IT staff who were part of the

implementation and those currently providing technical support for the system, as well as management of the VHSL, who are the owners of the system were also included. All departments with less than ten (10) or less permanent staff, as well as new employed staff with less than one year experience were excluded. It was assumed that whiles new staff could not be measured on pre-implementation satisfaction, departments with more staff have high probability of getting more respondents who might have had more interactions with the system.

3.6 Data Collection and Administration

In this study, a survey was conducted through online questionnaire administration using Microsoft Forms. Structured questionnaire, consisting of both open-ended and close-ended questions were used. In addition, project documents including benefits profile, benefits register, benefits maps, the benefits management plan and the benefits management strategy were used as sources of evidence.

The questionnaire used for the data collection was structured into four sections, A, B, C and D. The section A covered the demographic data of respondents, whiles sections B and C consists of questions and declarative statements derived from literature prompting for benefits realization processes (expected and realized benefits) and management (benefits measurement procedures) with slight modifications plus controlling variables. Section D covered the benefits realization tools and techniques used by aligning questions with the associated documentations. The questions under sections B, C and D were designed with a 5-point Likert scale, with score categories range from "Strongly agree" (5) to "Strongly disagree" (1). The questionnaire was designed with Microsoft Teams forms and rolled out

online. Participants were sent a link to the questionnaire through their corporate e-mail address and responses were automatically collated as respondents submitted the completed forms. The survey was conducted after permission had been sought from the Director of MIS. A respondent required an average of 10 minutes to complete the questionnaire.

3.7 Data Analysis and Presentation

The collated data was transposed into Microsoft Excel worksheet and was then exported into STATA version 16.0 and SPSS software. The data was analyzed, and general frequencies and cross tabulations were run for input into appropriate tables.

In the section A of the analysis, a descriptive univariate analysis for frequencies and means for continuous variables were derived to describe the demographic attributes of the participants. Section B and C of the study evaluated four benefits derived from the stated objectives of the solution. Each of these benefits had some indicators so composite variables were created for each indicator of each benefit and run an average of the composite variable created. The mean of the average composite variable was calculated to arrive at which benefit respondents rated as high. In this case, the higher the mean score of a benefit, the higher the perception of targeted or realized benefits. Section D matches benefits realization tools and techniques from literature and documented best practices against the project implementation and technical support teams' responses. The mean score of each statement was deduced and the higher the score, the higher the rate assigned the tool used to facilitate the targeted benefit to be likely realized or otherwise.

3.8 Limitation of Study

The field work for this study took place during the Covid-19 outbreak in Ghana. The protocols imposed such as the social distancing restricted data collection to only online methods. We believe that a face-to-face interaction and a visit to the facilities as well as opportunity to have interacted with the EMR would have provided a more convincing conclusion.

CHAPTER FOUR

RESULTS

4.0 Introduction

In this chapter, we pictorially present and describe the outcomes of the field data collected. We also describe the correlations between the two dimensions of stakeholders' expectations and satisfaction, using the pre-test and post-test calculated figures.

4.1 Demographic characteristics of respondents

Out of one hundred and twenty (120) staff who selected to respond to questionnaires for this study, eighty-three (83) representing 70.83% responded. The mean and standard deviation age of the respondents were 37.34 (±9.46). Out of the total 83 respondents, 50 (60.2%) were males, 29 (34.9%) were found in the age group of 30 to 39 years, 62 (74.7%) do not work in the health department, 30 (36.1%) worked at Akosombo, 57 (68.7%) worked for three to five years, and 62 (74.7%) interacted with the system as users (Table 4.1).

Table 4.1: Demographic characteristics of respondents

Variable	Freq. N = 83	Percent
Age: Mean (Standard deviation) 37.34 (±)9.46		
Sex		
Female	33	39.8
Male	50	60.2
Age group		
20-29	22	26.5
30-39	29	34.9
40-49	21	25.3
50-59	11	13.3
Department		
Health	21	25.3
Non-Health	62	74.7
Location		
Aboadze	16	19.3
Accra	25	30.1
Akosombo	30	36.1
Akuse	12	14.5
Experience in years		
2 or less	26	31.3
3-5 Years	57	68.7
Capacity		
User	62	74.7
Support	21	25.3

Source: Fieldwork data by author, 2020

4.1.1 Work location and Departments of respondents

As shown in figure 4.1 below, a total of 21 (25%) of respondents are from the VHSL, 17(21%) from MIS, 9 (11%) from HGD, 7 (8%) from TGD, 6 (7%) from PRD and ESD. Only 5 (6%) respondents were from the HRD with the remaining 4 (5%) each coming from the FND, TSD, and VAD respectively.

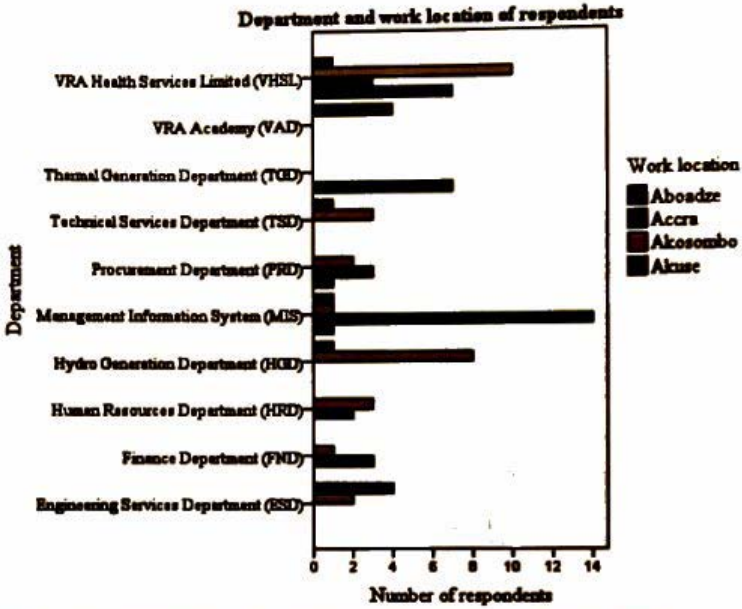

Figure 4.1: Department and work location ; Source: Fieldwork data by author, 2020

4.2 Stakeholders Expectaion Levels against Demographices

Out of the total respondents, 55 (66.3%) had high expectation of the proposed EMR and 28 (33.7%) had low expectations (Figure 1). Detailed expression of expectation level is illustrated in figure 4.2.

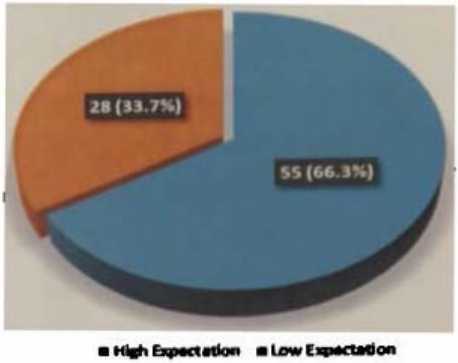

Figure 4.2: Expectation level
Source: Fieldwork data by author, 2020

From table 4.2, 24, representing 72.7% of females had high expectations and 31 representing 62% of males had high expectations. Nineteen (19) representing 86.4% of total age group of 20 to 29 years, 19 representing 65.5% of total age group of 30 to 39 years, 11 representing 52.4% of total age group of 40 and 49 years, and 6 representing 54.5% of total age group of 50 to 59 years all had high expectations. Nineteen (19) representing 90.5% of health workers had high expectations and 36 representing 58.1% of non-health workers had high expectations. Out of 30 workers who worked in Akosombo, 16 representing 53.3% had high expectations, 20 representing 80% of total Accra workers had high expectations, 11 representing 68.7% of Aboadze workers had high expectations and 8 representing 66.7% of Akuse workers had high expectations. 40 representing 70.2% of workers with three to five years of experience and 15 representing 57.7% of workers with two years or less experience all had high expectations. 38 representing 61.3% of system users and 17 representing 80.9% of system supporters all had high expectations.

Department of work was (X^2=7.3718; p-value=0.007) associated with expectation level. The odds of respondents that were in the age group of 40 to 49 were 8 times less to have high expectations than the odds of those in the age group of 20 to 29 to have high expectation [COR=0.2; CI(95%)=0.04 – 0.77; p-value=0.021]. Non-health workers were 90% less likely of having high expectations compared to their counterparts that were health workers [COR=0.1; CI (95%)=0.03 – 0.68; p-value=0.014].

Table 4.2: Expectation level against demographics.

Variable	Expectation Level: Low N = 28 n (%)	High N = 55 n (%)	Total N = 83 n (%)	chi2 (p-value)	COR(95% CI)p-value
Sex					
Female	9 (27.3)	24 (72.7)	33 (100)		R
				1.0233	
Male	19 (38.0)	31 (62.0)	50 (100)	(0.312)	0.6(0.24, 1.59)0.314
Age group					
20-29	3 (13.6)	19 (86.4)	22 (100)		R
30-39	10 (34.5)	19 (65.5)	29 (100)		0.3(0.07, 1.26)0.101
40-49	10 (47.6)	11 (52.4)	21 (100)		0.2(0.04, 0.77)0.021
				6.4695	
50-59	5 (45.5)	6 (54.5)	11 (100)	(0.091)	0.2(0.03, 1.04)0.055
Department					
Health	2 (9.5)	19 (90.5)	21 (100)		R
				7.3718	
Non-Health	26 (41.9)	36 (58.1)	62 (100)	(0.007)	0.1(0.03, 0.68)0.014
Location					
Aboadze	5 (31.3)	11 (68.7)	16 (100)		R
Accra	5 (20.0)	20 (80.0)	25 (100)		1.8(0.43, 7.69)0.416
Akosombo	14 (46.7)	16 (53.3)	30 (100)		0.5(0.14, 1.86)0.315
Akuse	4 (33.3)	8 (66.7)	12 (100)	4.399 (0.221)	0.9(0.18, 4.50)0.907
Experience					
2 or less	11 (42.3)	15 (57.7)	26 (100)		R
				1.2447	
3-5 Years	17 (29.8)	40 (70.2)	57 (100)	(0.265)	1.7(0.66, 4.52)0.267
Capacity					
User	24 (38.7)	38 (61.3)	62 (100)		R
				2.7129	
Support	4 (19.1)	17 (80.9)	21 (100)	(0.100)	2.7(0.81, 8.94)0.108

Source: Fieldwork data, 2020

Moreover, to further enhance understanding, stacked bar charts were adopted to describe the pattern of response of each item. From figure 4.3, the data shows that a higher proportion of respondents had a higher expectation of benefits of e-health solutions adoption. About 9 in 10 (95%) women expected (including both strongly agree and agree) that the system will increase productivity by speeding up work process.

More than 8 in 10 (86%) women also expected that the system will enable them to ask and receive response to health queries. More than 9 in 10 (94%) women expected that the system will help reduce patient waiting time at the facility. Almost one-third (32%) of women expected that the system will enable them to easily access the personal health data.

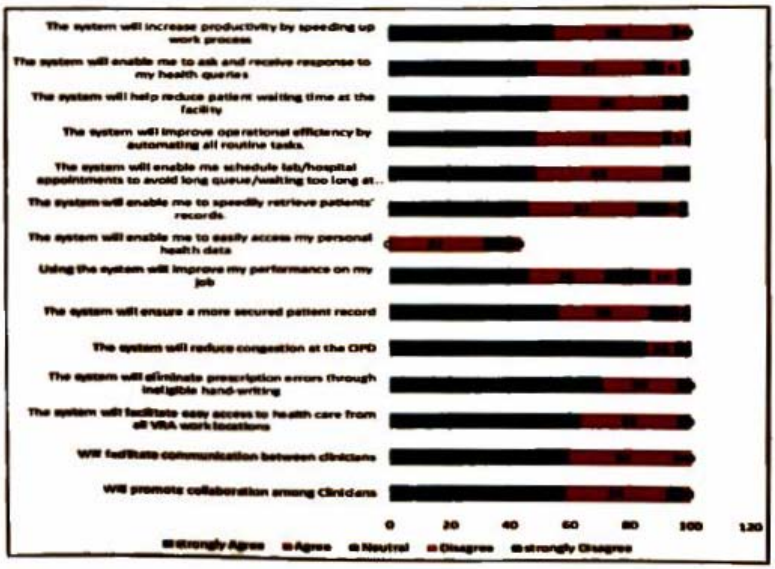

Figure 4.3: Expected benefits of e-health adoption.
Source: Fieldwork data, 2020

4.3 Stakeholders Satisfaction Levels against Demographices

Out of the total respondents, 32 (38.6%) had high satisfaction of the depolored EMR system and 51 (61.4%) had low satisfaction (Figure 4.4). Detailed expression of satisfaction level is illustrated in table 4.3.

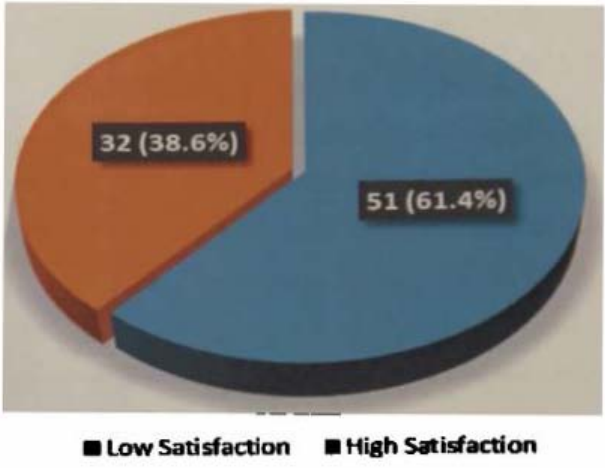

Figure 4.4: Satisfaction Level
Source: Fieldwork data by author, 2020

From table 4.3, 15 (45.5%) of females and 36 (72.0%) of males all had low satisfaction. Eleven (50.0%) of those in the age group of 20 to 29 years, 18 (62.1%) of those in the age group of 30 to 39 years, 16 (76.2%) of those in the age group of 40 to 49 years, and 6 (54.5%) of those in the age group of 50 to 59 years all had low satisfaction. 5 (23.8%) of health workers and 46 (74.2%) of non-health workers all had low satisfaction. 12 (75.0%) of Aboadze workers, 11 (44.0%) of Accra workers, 17 (56.7%) of Akosombo workers and 11 (91.7%) of Akuse workers all had low satisfaction. 21 (80.8%) of having two years or less

experience and 30 (52.6%) of having three to five years' experience all had low satisfaction. And 40 (64.5%) of system users and 11 (52.4%) of system supporters all had low satisfaction. Sex (X^2=5.9132; p-value=0.015), department (X^2=16.8095; p-value=0.000), location of work (X^2=9.3682; p-value=0.025), and experience of work (X^2=5.9674; p-value=0.015) were all associated with satisfaction level. For a male, the odds of being satisfied with the implemented e-health solution was 7 times as low as the odds of a female counterpart being satisfied [COR=0.3; CI(95%)=0.13 – 0.82; p-value=0.017].

The odds of a non-health worker having high satisfaction was 9 times as low as the odds of a health worker having high satisfaction [COR=0.1; CI(95%)=0.03 – 0.34; p-value = 0.000] and [AOR=0.1; CI(95%)=0.01 – 0.32; p-value=0.002]. Workers in Accra were 28.9 times more likely to have high satisfaction compared to workers in Aboadze [AOR=28.9; CI (95%) = 2.77 – 302.19; p-value=0.005] and workers in Akosombo were 10 times more likely to have high satisfaction compared to their Aboadze counterparts [AOR=10; CI (95%) = 1.13 – 88.50; p-value=0.038]. Those who had experience of three to five years were 3.8 times more likely to have high satisfaction compared to their counterparts who had experience of two years or less [COR=3.8; CI(95%)=1.25 – 11.42; p-value=0.018].

Table 4.3: Satisfaction level against demographics

Variable	Satisfaction Level			chi2 (p-value)	COR(95% CI)p-value	AOR(95% CI)p-value
	Low	High	Total			
	N = 51	N = 32	N = 83			
	n (%)	n (%)	n (%)			
Sex						
Female	15 (45.5)	18 (54.5)	33 (100)		R	R
Male	36 (72.0)	14 (28.0)	50 (100)	5.9132 (**0.015**)	0.3(0.13, 0.82)**0.017**	0.3(0.07, 1.13)0.073
Age group						
20-29	11 (50.0)	11 (50.0)	22 (100)		R	
30-39	18 (62.1)	11 (37.9)	29 (100)		0.6(.20, 1.88)0.390	
40-49	16 (76.2)	5 (23.8)	21 (100)		0.3(0.08, 1.15)0.081	
50-59	6 (54.5)	5 (45.5)	11 (100)	3.3696 (0.338)	0.8(0.20, 3.56)0.806	
Department						
Health	5 (23.8)	16 (76.2)	21 (100)		R	R
Non-Health	46 (74.2)	16 (25.8)	62 (100)	16.8095 (**0.000**)	0.1(0.03, 0.34)**0.000**	0.1(0.01, 0.32)**0.002**
Location						
Aboadze	12 (75.0)	4 (25.0)	16 (100)		R	R
Accra	11 (44.0)	14 (56.0)	25 (100)		3.8(0.96, 15.18)0.057	28.9(2.77, 302.19)**0.005**
Akosombo	17 (56.7)	13 (43.3)	30 (100)		2.3(0.60, 8.78)0.225	10(1.13, 88.50)**0.038**
Akuse	11 (91.7)	1 (8.3)	12 (100)	9.3682 (0.025)	0.3(0.03, 2.83)0.276	1.3(0.07, 21.81)0.876
Experience						
2 or less	21 (80.8)	5 (19.2)	26 (100)		R	R
3-5 Years	30 (52.6)	27 (47.4)	57 (100)	5.9674 (**0.015**)	3.8(1.25, 11.42)**0.018**	3.9(0.84, 17.70)0.081
Capacity						
User	40 (64.5)	22 (35.5)	62 (100)		R	
Support	11 (52.4)	10 (47.6)	21 (100)	0.9751 (0.323)	1.7(0.61, 4.50)0.326	

Source: Fieldwork data by author, 2020

4.4 Benefits from e-Health Solution Implementation

In matching pretest and posttest scores from the same group of people, the paired *t* test was employed using SPSS software. For instance, regarding the 14th item (Using the system will improve my performance on my job), the mean pretest is 3.68, while the mean posttest score is 2.39. When subjected to t test for the paired samples, the results show a statistically significant failure (t=9.58; n=82; p=0.000). In all the 14 benefits assessment items, it was observed that the mean pretest score was higher than the post test score. The data was

subjected to the *t* test for paired samples, with the results showing a statistically significant failure for all items. This suggests that the pretest scores are higher than post-test score.

4.5 Challenges in benefits realization and stakeholder knowledge in BRM

In addressing the third and the final objective, a sub-sample of 15 out of the 83 respondents, consisting of managers and members of the project implementation team was used. They were accessed on their knowledge and expertise on BRM processes. These included benefits identification, benefits planning, managing and reporting, benefits evaluation and benefits realization challenges.

4.5.1 Benefits identification

When asked whether key stakeholders were identified, 67% of respondents agreed with 20% disagreeing to this fact. As to whether vision, objectives and potential benefits were aligned with strategic drivers, 13% agreed and 20 % disagreed with over 60% responding in the neutral. Only 13% agreed that management explicitly explained what they expected from their investment while 60% disagreed. 27% of respondents strongly disagreed and 60% disagreed that there was a benefits realization strategy for the project while 20% and 73% of respondents strongly disagreed and disagreed that benefits and outcomes were mapped with stakeholders respectively. None of the respondents agreed that desired benefits from the project was agreed upon by all stakeholders and that sponsorship buy-in and ownership of benefits were obtained.

Table 4.4: Mean Score and ranking of e-Health Solution according to users' expectations and satisfaction

Item	Statements	Mean Pre-test score	Mean Post-test score	Standard deviation	Standard Error	t (p-value)
B1	The system will enable me to easily access my personal health data.	4.87	4.52	0.526	0.06	5.875(0.000)
B2	The system will enable me to speedily retrieve patients' records.	4.06	2.83	0.034	0.114	10.787(0.000)
B3	The system will enable me schedule lab/hospital appointments to avoid long queue/waiting too long at the facility.	4.53	3.74	0.607	0.067	11.72(0.000)
B4	The system will improve operational efficiency by automating all routine tasks.	4.41	2.83	0.84	0.09	17.04(0.000)
B5	The system will help reduce patient waiting time at the facility.	4.47	2.72	0.90	0.10	17.50(0.000)
B6	The system will enable me to ask and receive response to my health queries	4.45	2.66	0.89	0.09	18.06(0.000)
B7	The system will increase productivity by speeding up work process	4.40	2.72	0.90	0.09	16.914(0.000)
B8	Will promote collaboration among Clinicians	4.61	3.57	0.81	0.08	11.62 (0.000)
B9	Will facilitate communication between clinicians	4.64	3.63	0.77	0.085	11.89 (0.000)
B10	The system will facilitate easy access to health care from all VRA work locations	4.60	4.09	0.86	0.09	5.37(0.000)
B11	The system will eliminate prescription errors through ineligible hand-writing	4.57	3.57	0.86	0.09	10.52(0.000)
B12	The system will reduce congestion at the OPD	4.49	2.60	0.922	0.10	18.44(0.000)
B13	The system will ensure a more secured patient record	4.57	3.76	0.85	0.09	8.72(0.000)
B14	Using the system will improve my performance on my job	3.68	2.39	1.22	0.135	9.58(0.000)

Source: Fieldwork data by author, 2020

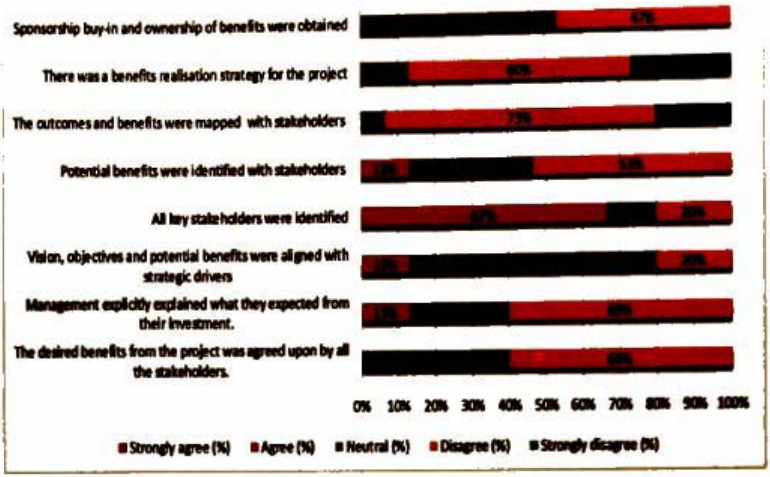

Figure 4.5: Benefits identification; Source: Fieldwork data, 2020

4.5.2 Managing and reporting benefits

In monitoring program process 86% agree, 7% responded in the neutral and 7% disagree. 60% agree on establish reporting on progress while 13% disagree with 27% responding in the neutral. In Operationalizing the benefits register or benefits tracking tool, majority of respondents were neutral (80%) and only 7% of them agreed and 13% disagreed. When asked if an effective and sustainable monitoring, data analysis and reporting process has been established, 40% were neutral and disagreed respectively with 20% responding in the affirmative (agree).

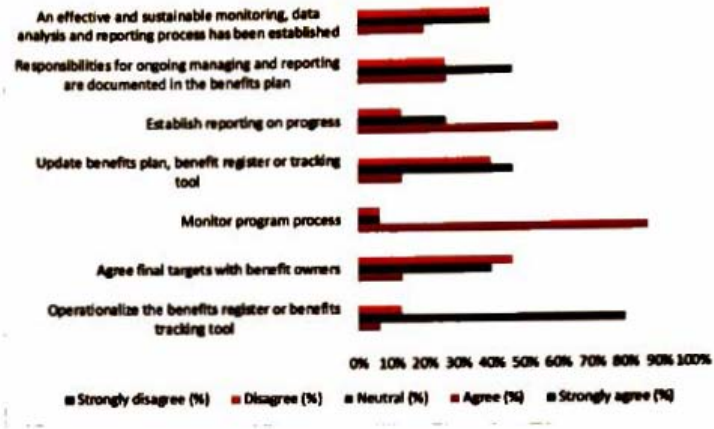

Figure 4.6: Managing & reporting benefits. Source: Fieldwork data, 2020

4.5.3 Benefits plan assessment

Over 80% of respondents agreed and 13% strongly agreed that there was lack of focus on people who will enjoy the benefits and that the focus of the project was on managing deliverables instead of focusing on the benefits. Eighty percent (80%) of respondents agreed and 13% disagreed that they lack understanding in the difference between benefits, outcomes and outputs. 80% also agreed that there was emotional commitment to see to the continuity of the project and so it is not open to changes to benefits that threaten project viability. Out of the fifteen (15) managers interviewed, 33% agreed that they did not have the experience or business awareness to manage benefits, 7% strongly agreed. 27% asserted that they lacked tools to ensure that benefits will be developed with 60% being neutral and 13% disagreeing with this assertion.

Respondents were asked if each expected benefit is assigned an owner, they all disagreed, 93% disagreed that baseline data and targets were agreed with benefit owners and 80% also did not agree that benefits are measurable with measures and data source known. 33% strongly disagreed that benefit profiles are developed. 7% also strongly disagreed that the project has benefits register and benefits governance scheme respectively.

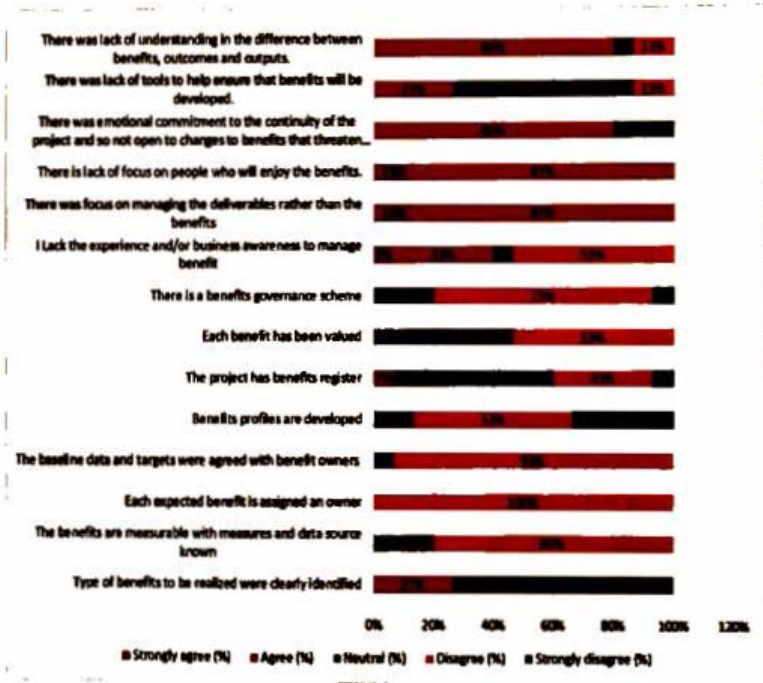

Figure 4.7: Benefits plan assessment.
Source: Field data, 2020

4.5.4 Benefit realization failure

The figure 4.8 shows that the factors contributing to benefit realization failure include ill-defined benefits, unavailability or inaccuracy of benefit measures data and unclear benefits ownership. The data shows that nearly 6 in 10 women (58% including strongly agree and agree) identify benefits ill-defined as a challenge of benefit realization failure. More than 7 in 10 (71%) women identified benefit measures data is unavailable or inaccurate as another factor. The final factor identified as another challenge is "benefits ownership were not clear". The data shows that more than 8 in 10 (83%) women stated that benefits ownership were not clear.

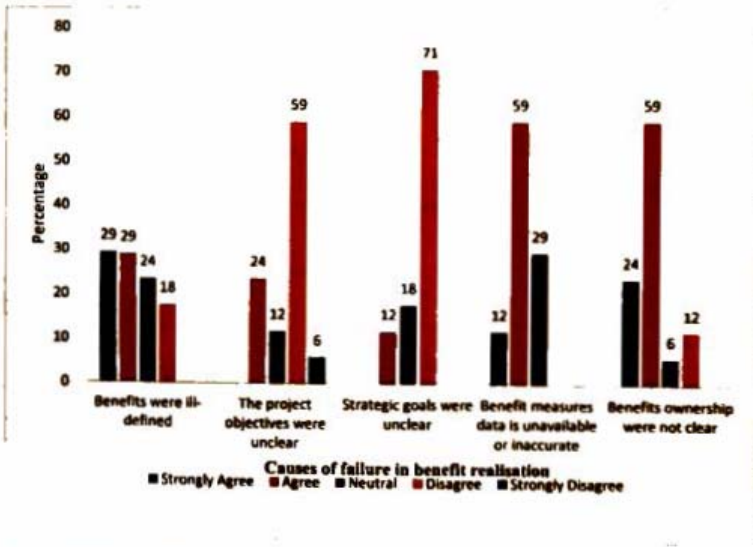

Figure 4.8: Causes of failure in benefits realization.
Source – Fieldwork data, 2020

Based on 15 managers and project implementation team, out of the 83 respondents to measure challenges of benefit realizations, the two variables "*benefit measures data is unavailable or inaccurate*" and "*benefits ownership not clear*" were ranked first with 100% responded for agree and strongly agree. This confirms that data and documentation that could facilitate in measuring benefits were mostly not available to stakeholders, and even where some data exist, it was inaccurate. Again, Benefits owners were not defined clearly. "*Benefits were ill-defined*" was ranked third with 86.7% responded for agree and strongly agree. Fourteen respondents (93.7%) agreed that strategic goals were clearly defined by the stakeholders whiles 13.3% believed that the project objectives were not clear. (Table 4.5).

Table 4.5: Challenges of benefits realization

Variable	Agree & Strongly Agree	Percent	Rank
Benefits were ill-defined	13	86.7	3
The project objectives were unclear	2	13.3	4
Strategic goals were unclear	1	6.7	5
Benefit measures data is unavailable or inaccurate	15	100	1
Benefits ownership were not clear	15	100	1

Source – Fieldwork data, 2020

CHAPTER FIVE

DISCUSSION

5.0 Introduction

The study addresses the question through a case study at VRA Hospitals Services Limited (VHSL) and lays the foundation towards answering the question on a generalized scale. The results of this study could in turn contribute to the development of a best practice methodology for e-Health Solution implementation, recognizing that a single case study is insufficient to generalize for all e-Health solutions implementations.

5.1 Pre-Implementation Expectations

Generally, there was a high expectation about the deployment of the e-health solution to facilitate the healthcare delivery within the organization, as about 66 percent of the workers expected that the e-health will enable them to improve their work.

Though age group was not all that very associated with the expectations of the e-health solution, which contradict with Treskes, Wildbergh, Schalij, and Scherptong (2019), those found in the age group of 40 to 49 were more likely to have high expectations compared to those in the age group of 20 to 29 (COR=0.2; p-value=0.021). The findings parallel earlier studies that suggest that older adults were less likely to use technology or they usually have a slower adoption rate and are more weary of technology so they may not generally accept that technology can solve all or most problems, centrally to younger adults (Czaja et al., 2006, Ellis & Allaire, 1999). The current study agreed with Adatara, Baku, Atakro, Adedia, and Jonathan (2019) which found that younger nurse managers are more familiar with

computer applications in their service of delivery than their older counterparts. However, though it also agreed with Treskes, Wildbergh, Schalij, and Scherptong (2019) of high expectations of e-health, age was a negative influence on expectations in this study. The difference might be as a result of the choice of study participants. As the current study chose both health and non-health workers, Treskes et al. (2019) used only healthcare setting.

Department at which an individual worked had an associated influence on the one's expectations on the e-health deployment. Non-health workers had a lesser (COR=0.1; p-value=0.014) expectation as compared to health workers. The reason might be that once it was named e-health, the tendency of it benefiting the healthcare workers was higher and non-health workers might not have thought of the system being of any importance to them hence the lesser expectation of benefits of the system.

Despite not being significant statistically, the expectation of staff with IT background and those trained to provide technical support to the system to deliver the intended benefits was 2.7 times higher, compared to the ordinary system user. This was as a result of their better understanding and appreciation of the e-health solution and technology in general. The implication of this finding is that, training impacts the perception and appreciation of the users. Management must therefore ensure that all users are well trained to use the system.

5.2 Post-Implementation Satisfactions

After the e-health deployment the needs of the workers were not met as majority (61.4%) of the respondents had low satisfaction about the system solving their intended problems. Almost the same percent (difference of 4.9%) between high expectations and low satisfactions, meanwhile the intents of using a system most at times predict the exploitation

of that system (Venkatesh, Thong, & Xu, 2012). The current result agreed with Emadi et al. (2017) which also found dissatisfaction of HIS to be user-friendly in an evaluation of HIS function by users on Kowsar and Amiralmomenin hospitals, Iran. Though the current study used a combination of a fourteen question Emadi et al. (2017) used a single question. This implies that though the e-health has been deployed, it has no direct benefits for the workers as their challenges remains unresolved. The reason for this might be that the workers were not trained well enough on the use of the system. Since it did not form part of their academic courses, there is the need for thorough training of the workers to enhance their usage. And those workers that were recruited after the deployment should also be trained well enough before giving the mandate (Darvish, Bahramnezhad, Keyhanian, & Navidhamidi, 2014). The sex of a worker influences the satisfaction level of the worker and males had lesser likelihood (odds) (COR=0.3; p-value=0.017) of being satisfied with the system that has been deployed than female workers. The current finding disagree with Adatara et al. (2019) which found that male nurses had higher knowledge of computer applications in service.

The side of department a worker found him or herself accounted for his or her satisfaction (p-value=0.000). In both non-adjusted and adjusted predictions, non-health workers were about 90% less to have been satisfied with the e-health that has been deployed (COR=0.1; p-value=0.000) and (AOR=0.1, p-value=0.002) respectively. The reason might be that since the system was e-health based system, it was focused on addressing health needs than the other needs hence favoring the healthcare provider users most often than the other users and as there is high demand from the health service, a hospital without a strong HIS lack a powerful tool to meet the demands of their client (Emadi et al., 2017). Moreover, non-health

workers were more likely to be frustrated with issues such as congestions at the OPD and long delays at the facilities than health worker.

The location of a worker also influences the satisfaction level of the worker (p=0.025). Workers who worked in Accra had the highest odds (AOR=28.9; p-value=0.005) of being satisfied with the system compared to their counterparts who worked in Aboadze. Accra being the national capital may have efficient network connectivity and stability than that of Aboadze and since e-health is network based, the workers in Accra may not have network challenges and thus, this might be a factor that made them more satisfied with the system. Akosombo might also have a higher network stability than that of Aboadze. The hosting of the VRA datacenter in Akosombo might have greatly contributed to the low network latency within the location, contributing to the throughput and stability, despite the fact that urban areas generally face less network challenges compared to rural or semi-urban areas.

The frequency of use by an individual improves familiarization with the system. In effect, time of interaction with the system has an influence on the satisfaction of the system (p-value=0.015). The longer one interacted with the system, the higher the satisfaction level of the system. Interaction three to five years with the system increases one's odds of satisfaction by about four (COR=3.8; p-value=0.018). This might be that as one continues to use the system and their familiarization increases or their issues addressed, they are able to interact with the system on their own to meet their desired challenges.

Though not statistically significant, those who give support to the system users were 1.7 times more likely to have high satisfaction of the system.

5.3 Challenges to Benefits Realization

Based on the five question to measure the challenges faced on benefits realization management, the most occurring challenges faced were benefits ownership were not clear and benefit measures data is unavailable or inaccurate, both of which respondents answered and were ranked first among the other questions. The least challenge was strategic goals were unclear which had a 6.7% agree or strongly agree and was ranked fifth. This means the stakeholders did not understand the benefits realization in terms of who it favors which agreed with Ali & Capuno (2019) who identified low level of awareness and understanding of the topic of e-solutions as a challenge. Moreover, ill-defined benefits were another major challenge for 86.7% agreed and strongly agreed on and this was ranked third among the five question measure.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.0 Introduction

The aim of this chapter is to provide conclusion to the objectives of the study and also offer suggestions or recommendations based on the study outcomes. The findings of the study were discussed in the previous chapter.

6.1 Main Findings and Conclusions

The study evaluated the knowledge in BRM and perceived benefits of e-health solution implementation at VRA Health Services Limited (VHSL) health facilities. The three main objectives included for the study was firstly to explore stakeholders' expectation of benefits of e-health solutions adoption. The second was to identify realised benefits from the EMR implementation and thirdly to determine the factors accounting for benefits realization failures in e-health solution projects.

The findings from this study parallel greater part of the literature and other previous studies of the benefits of EMR adoption and implementation. This study, however, has identified the levels of stakeholders' expectation prior to implementation, the actual benefits realized from the implementation and the factors mostly accounting for the failure in realising the expected benefits.

6.1.1 Stakeholders' Expectations and the Benefits Realized.

The first and second objectives were realized from the findings of the study. Fourteen benefit variables (Table 4.4) based on operational efficiency, communication and collaboration, patient safety and participation in care and quality of care were defined based on literature from similar studies (Zwikael & Smyrk, 2019, Serra & Kunc, 2017). Mean Pretest and Posttest scores were matched and in all the 14 benefits assessment variables, it was observed that the mean pretest score was higher than the post test score. This suggests that the stakeholders had higher expectations of the implemented e-health solution to deliver the targeted benefits. The findings show that about 61% of staff and management of VRA had high expectation of realizing the intended benefits.

The mean posttest score of each measurable variable gives an indication of satisfaction level and in effect, a suggestion that the particular benefit is realized. Out of the fourteen benefits variables, seven (50%) had high mean posttest score above the overall mean score of 3.26. A benefit in the upper half is deemed to have been realized, whereas those in the lower half suggests failure. Since the study sought to measure the satisfaction levels of the stakeholders, the significant difference between the expected benefits (expectations) and realized benefits (satisfaction) is an indication that not all benefits realized necessarily met the expectations of the stakeholders.

This means that measures should be put in place to improve the system to fully meet the expectation of stakeholders. Intensive training should also be given to stakeholders especially non- health workers to understand how the e-health system works. When this is done they will appreciate how the system works and its intended benefits to them.

6.1.2 Factors Accounting for Benefits Realization Failures

In addressing the third objective, the study focused on BRM and the survey questions were derived from related literature. Some of the factors identified regarding the stakeholders' failure to realize the targeted benefits include the lack of benefits planning, lack of understanding between benefits and project outcomes, lack of skill in the processes involved in managing, reporting and evaluating benefits. Moreover, inadequate training for users and network infrastructure challenges at Aboadze and Akuse usually leading to long hours of system downtime contributed to the low satisfaction rating of non-health workers. Major challenges from the perspectives of project team members accounting for the failure to realised benefits included ill-defined benefits, unavailable or inaccurate data for measuring benefits as well as failure to clearly assigning benefits ownership.

6.2 Recommendations

The study recommends that VRA as an institution undertake to ensure that:

A Benefits realization management framework is adopted for IT projects. Moreover, awareness workshops on such projects and programs should be thoughtfully planned. Also, staff should be regularly trained and assessed on the system. Finally, the current EMR processes must be reviewed and all the network infrastructure upgraded to improve efficiency.

REFERENCES

Achampong, E. K. (2012). Electronic health record system: a survey in Ghanaian hospitals. *Open Access Scientific Reports*, *1*(2), 1-4.

Adatara, P., Baku, E. A., Atakro, C.A., Adedia, D. M., & Jonathan, J. W. A. (2019). Factors Influencing Information and Communication Technology Knowledge and Use Among Nurse Managers in selected Hospitals in the Volta Region of Ghana. *CIN: Computers, Informatics, Nursing*, 37(3), 171 – 177.

Afarikumah, E. (2014). Electronic health in Ghana: current status and future prospects. *Online journal of public health informatics*, *5*(3), 230.

Aitken, I. (2003). Value Driven IT Management: Commercializing the IT Function. Computer Weekly – Professional Edition. 7

Ali, S. H. M., & Capuno, M. E. A. D. V. (2019). Assessing electronic banking services implementation in Khartoum, Sudan using electronic services dimensions. *Asian J. Management Science Education*, *8*(2), 37-41.

Amatayakul, M. (2013). Electronic Health Records: A Practical Guide for Professionals and Organizations. AHIMA press.

Ashurst, C., & Doherty, N. F. (2003). Towards the formulation of a 'best practice'framework for benefits realisation in IT projects. *Electronic Journal of Information Systems Evaluation*, *6*(2), 1-10.

Badewi, A. (2015). The impact of Project Management (PM) and Benefits Management (BM) practices on project success: Towards developing a project benefits governance framework. *International Journal of Project Management*, *34*(4), 761-778.

Badewi, A. (2015). Project Management, Benefits Management and Program Management. 85-104.

Badewi, A. (2016). *Investigating Benefits Realisation Process for Enterprise Resource Planning Systems. Doctoral Thesis.* Cranfield University.

Ball, M. J., Douglas, J. V. & Garets, D. E. (1999). Health Informatics: *Strategies and Technologies for Healthcare Information: Theory into Practice.*

Bartlett, J. (2006) Managing programmes of business change, Hampshire, UK. *Project Manager Today.*

Bennington, P., & Baccarini, D. (2004). Project benefits management in IT projects–An Australian perspective. *Project management journal*, *35*(2), 20-30.

Bocij, P., Chaffey, D., Greasley, A. & Hickie, S. (2006). *Business Information Systems* 3rd ed. Harlow: Pearson Education.

Bradley, G. (2006). Benefit Realisation Management: A Practical Guide to Achieving Benefits Through Change.

Bradley, G. (2010). *Benefit Realisation Management: A Practical Guide to Achieving Benefits Through Change*. Gower Publishing, Ltd.

Breese, R. (2012). Benefits realisation management: Panacea or false dawn? *International Journal of Project Management*, 30 (3) 341–351.

Breese, R., Jenner, S., Serra, C.E.M., & Thorp, J. (2015). Benefits management: Lost or found in translation. *International Journal of Project Management*, 33 (7), 1438-1451.

Burke, L., & Weill, B. (2018). Information Technology for the Health Professions.

Chittenden, J., & Van Bon, J. (2006). Programme management based on MSP: a management guide (1st ed.) Van Haren Publishing, Zaltbommel.

Clarke, A. Adamson, J., Sheard, L., Cairns, P., Watt, I., Wright, J. (2015). Implementing electronic patient record systems (EPRs) into England's acute, mental health and community care trusts: a mixed methods study: *BMC Medical Informatics and Decision Making*.

Cooke-Davies, T. (2002). The "real" success factors on projects. *International journal of project management*, *20*(3), 185-190.

Coombs, W. T. (2014). *Ongoing crisis communication: Planning, managing, and responding*. Sage Publications.

Creswell, J.W. and Creswell, J.D. (2018). Research Design: Qualitative, Quantitative and Mixed Method Approaches fifth edition

Czaja, S.J., Charness, N., Fisk, A. D., Hertzog, C., Nair, S. N., Rogers, W. A. & Sharit, J. (2006). Factors Predicting the Use of Technology: *Findings from the Center for Research and Education on Aging and Technology Enhancement* (CREATE). https://ncbi.nlm.nhi.gov/pmc1524856/#26 [Accessed: August 20, 2020].

Daim, T. U., Rueda, G., Martin, H., & Gerdsri, P. (2006). Forecasting emerging technologies: Use of bibliometrics and patent analysis. *Technological Forecasting and Social Change*, *73*(8), 981-1012.

Daim, T. U., Behkami, N. A., Basoglu, N., Kök, O. M., & Hogaboam, L.(2016). Healthcare Technology Innovation Adoption: *Electronic Health Records and Other Emerging Health Information Technology Innovations*. Springer.

Darvish, A., Bahramnezhad, F., Keyhanian, S., & Navidhamidi, M. (2014). The role of nursing informatics on promoting quality of health care and the need for appropriate education. *Global Journal of Health Sciences*, *6(6)*, *11*.

Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of management information systems*, *19*(4), 9-30.

Denzin, N. K. & Lincoln, Y.S. (1994a). The Sage *Handbook of Qualitative Research*. London, Sage Publication

Ellis E.R, Allaire A.J.(1999). Modeling computer interest in older adults: The role of age, education, computer knowledge, and computer anxiety. Human Factors. 41:345–355.

Emadi, A., Ghoochani, M., Zarei, J., Mohammadi, A., Hemmat, M., & Valinejadi, A. (2017). Evaluation of hospital information system performance from the perspective of users in educational hospitals. *IJCSNS International Journal of Computer Science and Network Security, VOL. 17 No. 7, July 2017*, *17*(7).

Farbey, B., Land, F. F. & Targett, D. (1993) How to Evaluate Your I/T Investment: *A Study of Methods and Practice*. Oxford. Butterworth Heinemann.

Farbey, B., Land, F., & Targett, D. (1999). Moving IS evaluation forward: learning themes and research issues. *The Journal of Strategic Information Systems*, *8*(2), 189-207.

Glynne, P. (2007). Benefits management-changing the focus of delivery. Association for Progress Management Yearbook 2006/07, 45-49.

Goldkuhl, L. (2005). *Multiple marketing channel conflict with a focus on the internet* (Doctoral dissertation, Luleå tekniska universitet).

González, J. M. F and Ubilla, D. L. L. (2017). Project Termination from a Benefit Realisation Management approach: *An abductive study of IT and R&D projects*.

Grain, H., Schaper, L.K. (2013). Health Informatics: Digital Health Service Delivery - The Future is Now! *Selected Papers from the 21st Australian Health Informatics Conference (HIC 2013)*.

Johnson, R.B. & Christensen, L. (2014). Educational Research: Qualitative, Quantitative and Mixed Method Approaches.

Kaplan, R. S., & Norton, D. P. (2008). *The execution premium: Linking strategy to operations for competitive advantage*. Harvard Business Press.

Kausar, S. (2017). *Examining the Role of Benefits Realization Management in Project Success; Mediating Role of Project Governance and Moderating Role of Readiness for Change*
(Master Thesis; Capital University of Science & Technology, Islamabad)

Leyton, R. (1995). Investment appraisal: the key for IT. *Hard money, soft outcomes. Alfred Waller, Henley on Thames.*

Lin, C. & Pervan, G. (2003). The practice of IS/IT benefits management in large Australian organisations. *Information and Management Journal*, 41, 13-24.

Martinelli, R. J., Milosevic, D. Z.(2016). Project Management Toolbox: *Tools and Techniques for the Practicing Manager*. Wiley 2nd edition

Melton, T., Iles-Smith, P. & Yates, J. (2008). Project Benefits Management: *Linking your Project to the Business*

Ministry of Health.(2005). *Health Sector ICT Policy Strategy*. Retrieved from https://www.ghanahealthservice.org/downloads/Health%20Sector%20ICT%20Policy%20and%20Strategy.pdf

Mintzberg, H. (1983). Structures in Five: Designing Effective Organizations Prentice Hall Englewood Cliffs.

Neuman, W.L. (2009) Social Research Methods Qualitative and Quantitative Approaches. 7th Edition, Pearson Education, Chandler.

Nogeste, K., & Walker, D. H. (2006). Using knowledge management to revise software-testing processes. *Journal of Workplace Learning*.

Nogeste, K. & Walker, D. H. T. (2005). Project outcomes and outputs: making the intangible tangible. *Measuring Business Excellence*, 9, 55 - 68.

Nøhr, C., & Aarts, J. (2010). Socio-technical challenges in implementing safe patient handovers. *Information Technology in Health Care: Socio-Technical Approaches 2010: From Safe Systems to Patient Safety*, *157*, 206.

NSWG. (2018) BRMFramework_Part 1, Principles: *The New South Wales Government Benefits Realization Management Framework*. NSW Government.

NSWG. (2018). BRMFramework_Part 2, Process: *The New South Wales Government Benefits Realization Management Framework*. NSW Government.

NSWG. (2018). BRMFramework_Part 3, Guidelines: *The New South Wales Government Benefits Realization Management Framework*. NSW Government.

NSWG. (2018). BRMFramework_Part 4, Implementation: *The New South Wales Government Benefits Realization Management Framework*. NSW Government.

NSWG. (2018). BRMFramework_Part 5, Glossary: *The New South Wales Government Benefits Realization Management Framework*. NSW Government.

OGC (2003). Managing Successful Programmes. London, *The Stationery Office*.

OGC (2007a). Managing Successful Programmes MSP. London, *The Stationery Office*.

OGC (2007b). STDK Home, Delivery Lifecycle: Benefits Management. Retrieved from http://www.ogc.gov.uk/sdtoolkit/reference/deliverylifecycle/benefits_mgmt.html#benmanagement1. Office of Government and Commerce.

Payne, S. (2007). Resilient carers and caregivers. *Resilience in palliative care–achievement in adversity*, 83-97.

Pellegrinelli, S. (1997). Programme management: organising project-based change. International Journal of Project Management, 15, 141-149.

Pellegrinelli, S., Partington, D., Hemingway, C., Mohdzain, Z., & Shah, M. (2007). The importance of context in programme management: An empirical review of programme practices. *International Journal of Project Management*, *25*(1), 41-55.

Peppard, J. (2007). The conundrum of IT management. *European Journal of Information Systems*, *16*(4), 336-345.

Public Health Informatics Institute. (2018). Building an Informatics-Savvy Health Department: A Self-Assessment Tool.

Peppard, Ward, Daniels (2007), Managing the Realization of Business Benefits from IT Investments, *MIS* Quarterly Executive, March 2007; Also in Ward and Peppard (2002), 449.

Peppard, J., Ward, J., & Daniel, E. (2008). Managing the Realization of Business Benefits from IT Investments. *MIS Quarterly Executive*, *6*(1), 3.

Philips, Z., Whynes, D. K., & Avis, M. (2006). Testing the construct validity of willingness to pay valuations using objective information about risk and health benefit. *Health economics*, *15*(2), 195-204.

PMI (2016c). *The High Cost of Low Performance*. Pulse of the Profession [online] PMI. Retrieved from:http://www.pmi.org//media/pmi/documents/public/pdf/learning/thoughtleadership/pulse/pulse-of-the-profession-2016.pdf

PMI (2017). *Success Rates Rise. Transforming the high cost of low performance*. Pulse of the Profession. [electronic] PMI. Available at: http://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/pulse-of-theprofession-2017.pdf

Reiss, G. (2006). *Handbook of Programme Management*, Gower Publishing Company, Limited

Remenyi, D., & Sherwood-Smith, M. (1998). Business benefits from information systems through an active benefits realisation programme. *International Journal of Project Management*, *16*(2), 81-98.

Sapountzis, S., Harris, K., & Kagioglou, M. (2008). Benefits Management and Benefits Realisation–A Literature Review. *HaCIRIC, the University of Salford*.

Scholes, K., Johnson, G., & Whittington, R. (2002). *Exploring corporate strategy*. Financial Times Prentice Hall.

Schwalbe K. (2016).Information Technology Project Management. 8th Edition, Cengage Learning.

Serra, C. E. M., & Kunc, M. (2015). Benefits realisation management and its influence on project success and on the execution of business strategies. *International Journal of Project Management*, *33*(1), 53-66.

Simon, T. (2003). What is Benefits Realisation? *The Public Manager*. 59-60.

Smyrk, J. (1995). The ITO model: A framework for developing and classifying performance indicators. *In The international conference of the Australasian evaluation society*. Sydney.

Tan, J. (2008). *Healthcare Information Systems and Informatics: Research and Practices: Research and Practices*, IGI Global.

Thorp, J. (2003). *The information paradox: realizing the business benefits of information technology*. McGraw-Hill Ryerson.

Treskes, R. W., Wildbergh, T. X., Schalij, M. J., & Scherptong, R. W. C. (2019). Expectations and perceived barriers to widespread implementation of e-Health in Cardiology practice: Results from a national survey in the Netherlands. *Netherlands Heart Journal*, 27(1), 18.

Truax, J. (1997). Investing with benefits in mind: curing investment myopia. *The DMR White Paper*, *1*(6).

Ul Musawir, A., Serra, C. E. M., Zwikael, O., & Ali, I. (2017). Project governance, benefit management, and project success: Towards a framework for supporting organizational strategy implementation. *International Journal of Project Management*, *35*(8), 1658-1672.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 157 – 178

Wager, K. A., Lee, F. W., & Glaser, J. P. (2017). *Health care information systems: a practical approach for health care management*, John Wiley & Sons.

Ward, J. M., & Griffiths, P. M. (1996). *Strategic planning for information systems*. John Wiley & Sons, Inc.

Ward, J., Taylor, P., & Bond, P. (1996). Evaluation and realisation of IS/IT benefits: an empirical study of current practice. *European Journal of Information Systems*, *4*(4), 214-225.

Ward, J., Murray, P., & David, E. (1997). *Benefits management: Best practice guidelines*. Cranfield School of Management, Information Systems Research Centre.

Ward, J., & Daniel, E. (2006). *Benefits management: Delivering value from IS & IT investments* (Vol. 30). Chichester: John Wiley & Sons.

Ward, J., & Daniel, E. (2012). *Benefits management: How to increase the business value of your IT projects*. John Wiley & Sons.

Ward, J. & Peppard, J. (2002). Strategic Planning for Information Systems (3rd Ed.) Chichester: Wiley.

Weaver, B., Lindsay, B., & Gitelman, B. (2012). Communication technology and social media: opportunities and implications for healthcare systems. *Online J Issues Nurs*, *17*(3).

Wolper, L. F. (2010). *Health care administration: managing organized delivery systems*. Jones & Bartlett Publishers.

Xierali, I. M., Hsiao, C. J., Puffer, J. C., Green, L. A., Rinaldo, J. C., Bazemore, A. W., ... & Phillips, R. L. (2013). The rise of electronic health record adoption among family physicians. *The Annals of Family Medicine*, *11*(1), 14-19.

Zielinski, K., Duplaga, M., & Ingram, D. (2007). *Information technology solutions for healthcare*. Springer Science & Business Media.

Zwikael, O., & Smyrk, J. (2011). Project management for the creation of organisational value. London: Springer.

Zwikael, O., & Smyrk, J. R. (2019). Project Management: A Benefit Realisation Approach. Springer

APPENDICES

Appendix A: Questionnaire

BENEFITS REALIZATION IN E-HEALTH SOLUTIONS IMPLEMENTATION: A CASE STUDY OF VOLTA RIVER AUTHORITY'S HEALTH SERVICES LIMITED (VHSL)

This questionnaire is designed to collect data on users' perception and project implementation team members' knowledge of the benefits and benefits realization processes respectively of the implementation of e-Health solution. The information provided will be solely used for academic purposes and will be treated with utmost confidentiality. The questionnaire contains four sections. I shall appreciate if you could kindly respond to each question by mark ticking (√) appropriately of filling in the spaces provided, where appropriate.

SECTION A: DEMOGRAPHIC DATA

1. **What is your gender?** 1. Male ( ) 2. Female ( )
2. **State your age (in years)** .....
3. **Select your department from the list provided** .....
   i. VRA Health Services Limited (VHSL) [ ],
   ii. Hydro Generation Department (HGD) [ ],
   iii. Thermal Generation Department (TGD) [ ],
   iv. Procurement Department (PRD) [ ],
   v. Engineering Services Department (ESD) [ ],
   vi. VRA Academy (VAD) [ ],

vii. Management Information System (MIS) [ ].

viii. Finance Department (FND) [ ].

ix. Technical Services Department (TSD) [ ] and

x. Human Resources Department (HRD) [ ]

4. Select your work location

i. Aboadze [ ]

ii. Accra [ ]

iii. Akosombo [ ]

iv. Akuse [ ]

5. What is your designation?

1. Medical Doctor [ ]
2. Nurse [ ]
3. Administrator (Hospital) [ ]
4. Administrator (Other department) [ ]
5. Pharmacist [ ]
6. Laboratory Technician [ ]
7. Computer Technician [ ]
8. Computer Programmer [ ]
9. Systems Administrator [ ]
10. Network Administrator [ ]
11. Engineer [ ]

12. Technician Engineer [ ]

13. Director [ ]

14. Any other (please specify) .....

6. **How long have you interacted with the Hospital Information Management System (HIMS)?**

.....

7. **In what capacity did you interact with the system? (Please select all that applies)**

i. User (Clinician) [ ]

ii. User (Non-Clinician) [ ]

iii. Support (IT) [ ]

iv. Support (Hospital) [ ]

SECTION B: STAFF/USERS EXPECTATION PRIOR TO THE IMPLEMENTATION OF THE E-HEALTH SOLUTION THROUGH AWARENESS WORKSHOPS

This section of the questionnaire is structured to assess respondents expected /targete benefits based on their perception from the solution to be implemented on efficienc collaboration and communication, quality of care and patient's safety

Please rate how much you agree that, before the e-Health solution implementation, yo expected to realize the benefits stated. (Please kindly indicate your choice by writing th corresponding to the choice in the appropriate box against each statement)

Item	Statement	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
B1	The system will enable me to easily access my personal health data					
B2	The system will enable me to speedily retrieve patients' records.					
B3	The system will enable me schedule lab/hospital appointments to avoid long queue/waiting too long at the facility.					
B4	The system will improve operational efficiency by automating all routine tasks.					
B5	The system will help reduce patient waiting time at the facility.					
B6	The system will enable me to ask and receive response to my health queries					
B7	The system will increase productivity by speeding up work process					
B8	Will promote collaboration among Clinicians					
B9	Will facilitate communication between clinicians					
B10	The system will facilitate easy access to health care from all VRA work locations					
B11	The system will eliminate prescription errors through ineligible hand-writing					
B12	The system will reduce congestion at the OPD					
B13	The system will ensure a more secured patient record					
B14	Using the system will improve my performance on my job					

SECTION C: BENEFITS REALIZED POST IMPLEMENTATION OF THE e-HEALTH (EMR) SOLUTION.

This section of the questionnaire is structured to assess respondents' satisfaction on the expected outcomes (benefits) directly or indirectly derived from the implemented solution.

Please rate how much you agree that, since the e-Health solution implementation, you have realized the benefits stated. (Please kindly indicate your choice by writing the number corresponding to the choice in the appropriate box against each statement)

Item	Statement	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
C1	The system enables me to easily access my personal health data .					
C2	The system enables me to speedily retrieve patients' records.					
C3	The system enables me to schedule lab/hospital appointments to avoid long queue/waiting too long at the facility.					
C4	The system has improved operational efficiency by automating all routine tasks.					
C5	The system has helped to reduce patient waiting time at the facility.					
C6	The system enables me to ask and receive response to my health queries					
C7	The system has increased productivity by speeding up work process					
C8	Promotes collaboration among Clinicians					
C9	Will facilitate communication between clinicians					
C10	The system enables me to easily access to health care from all VRA work locations					
C11	The system has eliminated prescription errors through ineligible hand-writing					
C12	The system has reduced congestion at the OPD					
C13	The system has ensured a more secured patient record					
C14	Using the system has improve my performance on my job					

SECTION D: BENEFITS REALIZATION MANAGEMENT (TOOLS AND TECHNIQUES) ADOPTED DURING THE E-HEALTH SOLUTION PROJECT IMPLEMENTATION, CHALLENGES ENCOUNTERED IN BENEFITS REALIZATION AND STAKEHOLDER KNOWLEDGE IN BRM.

This section of the questionnaire is administered to staff from VHSL, MIS, PMU, Change Management who were directly involved in the implementation of the e-Health Solution (EMR) and the implementation of similar projects.

Please rate how much you agree on each of the following statements, during and after the e-Health solution project execution. (Please kindly indicate your choice by writing the number corresponding to the choice in the appropriate box against each statement).

Item	Statement	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
D	***BENEFITS IDENTIFICATION***					
D1	The desired benefits from the project was agreed upon by all the stakeholders.					
D2	Management explicitly explained what they expected from their investment.					
D3	Vision, objectives and potential benefits were aligned with strategic drivers					
D4	All key stakeholders were identified					
D5	Potential benefits were identified with stakeholders					
D6	The outcomes and benefits were mapped with stakeholders					
D7	There was a benefits realisation strategy for the project					
D8	Sponsorship buy-in and ownership of benefits were obtained					
	BENEFITS PLAN					
D9	Type of benefits to be realized were clearly identified					
D10	The benefits are measurable with measures and data source known					
D11	Each expected benefit is assigned an owner					
D12	The baseline data and targets were agreed with benefit owners					

D13	Benefits profiles are developed					
D14	The project has benefits register					
D15	Each benefit has been valued					
D16	There is a benefits governance scheme					
D17	I Lack the experience and/or business awareness to manage benefit					
D18	There was focus on managing the deliverables rather than the benefits.					
D19	There is lack of focus on people who will enjoy the benefits.					
D20	There was emotional commitment to the continuity of the project and so not open to changes to benefits that threaten project viability.					
D21	There was lack of tools to help ensure that benefits will be developed.					
D22	There was lack of understanding in the difference between benefits, outcomes and outputs.					
	MANAGING & REPORTING BNEFITS					
D23	**Operationalize the benefits register or benefits tracking tool**					
D24	**Agree final targets with benefit owners**					
D25	**Monitor program process**					
D26	**Update benefits plan, benefit register or tracking tool**					
D27	**Establish reporting on progress**					
D28	**Responsibilities for ongoing managing and reporting are documented in the benefits plan**					
D29	**An effective and sustainable monitoring, data analysis and reporting process has been established**					
	BENEFITS EVALUATION					
D30	**The expected program outcomes were realised**					

D31	The benefit management deliverables provide sufficient evidence to evaluate the project					
D32	The stakeholders realise the benefits they expected					
D33	Progress towards the vision end state have been reported against					
D34	Lessons learnt are captured to inform continuous improvement					
D35	The benefits deliverables are reviewed					
	CHALLENGES ENCOUNTERED IN BENEFITS REALISATION					
D36	Benefits were ill-defined					
D37	The project objectives were unclear					
D38	Strategic goals were unclear					
D39	Benefit measures data is unavailable or inaccurate					
D40	Benefits ownership were not clear					
	KNOWLEDGE OF STAKEHOLDERS ON BENEFITS REALIZATION MANAGEMENT					
D41	**A benefit is a measurable improvement resulting from an outcome which is perceived as an advantage by a stakeholder**					
D42	**Benefits must be aligned to the organization's strategic goals**					
D43	**Benefits need to be first understood as outcomes. Benefits are the reason an investment is made**					
D44	**Benefits must be measurable and evidence-based in order to demonstrate that an investment provides value**					
D45	**Benefits can only be realised through change and change can only be sustained by realising benefits**					
D46	**Benefits need to be owned by appropriate sponsors and managers, not by the program/project manager**					
D47	**Intermediate benefits are needed to realise end benefits (and are just as important).**					

D48	Benefits are dynamic; they need to be regularly reviewed and updated					
D49	Keep the number of benefits monitored and reported to a sensible, manageable number					
D50	Benefits management should be integrated with other organisational processes, including Project Management and Program Evaluation					