



**USE OF HOSPITAL MANAGEMENT INFORMATION SYSTEMS AND
TECHNOLOGY IN HEALTHCARE SERVICE PROVISION AMONGST NON-
GOVERNMENTAL ORGANISATIONS' IN KENYA: A CASE OF LVCT, KENYA**

BY

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(P54/79218/2015)

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A research project submitted in partial fulfillment of the requirement for the award of Master of
Science in Information Communication and Technology Management at the University of
Nairobi.

September, 2018

DECLARATION

This research is my original work and has not been submitted for a Degree in this University or any other University.

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ACKNOWLEDGEMENT

I thank the Almighty God for His guidance, care and providence which enabled me to undertake this project. My sincere thanks also go to the management and staff of LVCT Health for their cooperation in giving me the data that came in handy in doing this research. I am also glad to note that University of Nairobi granted me an admission into the School of Computing & Informatics to undertake this worthy course.

I am also indebted to my supervisor Prof. Robert Oboko and the entire panelist for the role they played in guiding me during the entire research period. They were a source of encouragement and their thoughts contributed greatly to my success.

Lastly but not least I acknowledge my family and friends for both financial and moral support they provided while I was working on this research project.

DEDICATION

I dedicate this research work to my beloved parents Mr. and Mrs. Absalom Afula Mnawe for their financial, spiritual and moral support. Sincere gratitude also goes to my Wife Mrs. Khadija Mutua Khainja for her endless support.

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ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|--|
| HMIS - | Health Management Information System |
| HMISs - | Hospital Management Information Systems |
| IQCARE - | International Quality CARE |
| ADT - | Antiretroviral Dispensing tool |
| ICT - | Information Communication and Technology |
| NASCOP – | National Aids & STI Control Programme |
| USAID – | United States Agency for International Development |
| IS – | Information Systems |
| CDC – | Centers for Disease and Control prevention |

ABSTRACT

Aim: This research study sought to examine use of Hospital Management Information Systems and Technology in Healthcare service delivery amongst Non-Governmental Organizations (NGOs): A case of LVCT, Nairobi.

Methodology: The study was conducted between the Months of March 2018 and May 2018 at four branches of LVCT. These included LVCT HQ, Kisumu Tivoli, Nairobi CBD and Kisumu Naselica. The population of the study was 124 respondents drawn from all departments in the institution. The researcher used stratified sampling followed by purposive sampling where 124 respondents formed part of the study. These respondents were drawn from the departments currently utilizing the Information system and Technology in their service delivery. The 124 respondents were 10 from ICT, 44 from Care Clinic Division, 10 from M&E division, 5 from Senior Management, 6 statistician, 10 Regional Doctors, 20 support staff and 10 from Research Division.

However a response rate of 92 respondents forming 88.46% came back out of the 104 respondent in the study.

Findings: The research findings revealed that the independent variables performance expectancy, effort expectancy, social influence and facilitating conditions all had a positive relationship with the use of hospital Management Information Systems and Technology amongst NGOs in Kenya. Similarly, experience which acted and an intervening variable also had positive correlation with the dependent variable. It also indicated that four independent variables contribute 45.2% to the use of Hospital Management Information System (IS) and Technology in delivery of healthcare services amongst NGOs in Kenya. The analysis further showed that independent variables were highly significant in contributing to dependent variable at significance level of 0.000 as shown in the Sig. F Change in the Anova and model summary. Research findings further revealed that experience has significant moderating effects on the relationship between two independent variables (performance expectancy, facilitating conditions) and use of hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya.

Keywords: Effort expectancy, performance expectancy, Information system, Technology, Use of Information System, Service delivery.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Strengthening health systems is currently a global priority as indicated in SDG 2015, WHO 2010 and Kenya's vision 2030. One of the objectives of Kenya's vision 2030 is to enable the country realize its competitiveness and be a prospective nation. Social empowerment is one of the three pillars. It encompasses provision of health in an accessible and cost effective way to its citizens. The availability and use of Hospital Management Information System is one of the available means of improving access to health (HotchkHMISSs, Diana, & Foreit, 2012; Kihuba et al. 2014). Public, private as well as NGOs are continuously on the look out for the opportunities that present themselves as a result of successfully utilizing Information system and Technology in healthcare service provision.

The implementation and use of HMIS in healthcare sector facilitates efficient health care quality and health- Information exchange amongst the stakeholders (hospitals, governments, patients and even the insurance companies) (Kuperman, 2011). In developing countries, healthcare sector is characterized with increased inefficiencies. It is such inefficiencies that donors from outside African countries have made efforts by allocating their donations to specific areas in health. Such donors include but not limited to only World Bank and The World Health Organization. This has been attempted by these international organizations promoting sustainable use of health information systems.

The use of Information system and Technology in healthcare facilities is generally intended to “facilitate operations in hospital administration for patient billing, accounting systems, personnel and payroll, materials management. Similarly, it can used in clinical order entry for drugs, lab tests, procedures, electronic health records, diagnostic image archiving, lab results, clinical decision support systems, prescription drug fulfillment, error-alert, transcriptions Monitoring of patients in intensive care units. Infrastructure Personal computers Servers and wireless network routers Voice recognition systems for transcription, physician orders, and medical records Bar-coding for drugs, medical device inventory control Information security systems” (Chumba, 2017). Goodman, Gorman & Herrick, (2010) states that the role of HIS in developing countries

is to improve healthcare quality, increase efficiency, and add convenience to the health providing facilities. It is not only intended to routinely collect health services data and transfer the same to senior levels to facilitate decision-making at all levels especially at the point of collection. It also enables patients and other health stakeholders to access medical information ubiquitously. Both developed and developing countries perceive that the use of Information system and Technology in health service provision translate to benefits such as improved Information sharing through continuous sharing of information related to clinical medicine. This is due to availability of integrating databases of patient treatments across large populations thus enhancing outcomes research, yielding information on which treatments work best (Perlin & Kupersmith, 2007). Improved collaboration and information sharing is also another enhanced aspect of networked healthcare. Wallace (2007) noted that information sharing assists researchers in learning about treatments for such diseases as cancer. Furthermore, the use of HIS improves the quality provision of health care since both healthcare providers and patients can access patient related information anywhere and anytime (Burt & Sisk, 2005). This is also seen in other instances where patients see a number of physicians. This enables them to remotely access their medical histories that could help facilitate coordination of care among different providers.

Generally, the healthcare sector in developing countries is one of the sectors that majorly depend on donor funding. In Mozambique for example, “80% of the budget for the health sector is based on international aid (Beattie and Kraushaar, 2000). Some of the challenges facing these countries include large amount of unreliable health data, poor human resources, and poor IT infrastructure (Sahay 2001; Walsham et al., 1988). Other challenges that were apparent in Mozambique and Tanzania include the existence of unfavorable and unsupportive political, socio-economic, and technological factors (Mursu et al. 2000). Donor policies (such as short term funding, top down approaches (lower people not considered in decision making) and focus on Information system and Technology) also significantly contribute to the problem of unsustainable HIS (Heeks et al., 1999). Moreover, donor support for health projects is relatively short term in nature. Given that HIS projects may take a long time to be fully institutionalized, sufficient resources are required to build local capacity (technical, managerial and financial) to support and sustain such projects after the withdrawal of donors. This inadequate support contributes to a lack of human resource capacity, ineffective system design, and a dominant focus on Information system and

Technology rather than on the needs of the users. This contributes to the design and implementation of unsustainable HIS”. Researchers have further noted that sustainability of HIS is required as it will ensure effective and efficient use of Information system and Technology.

Sustainability of Hospital Management Information System refers to the ability of a system to withstand time and space. The system has to be “effectively institutionalized in the workings of the health department. Institutionalization can thus be described as the process by which HIS can be sustained over time. Sustainability implies maintaining something that already exists over time and is often equated with being self-sustaining or self-sufficient, implying that no outside support is needed to continue its existence (Reynolds and Stinson 1993). With regard to IT, sustainability implies the ability to identify and manage risks threatening the long-term viability of IT (Korpela et al. 1998). Misund and Høiberg (2003) define sustainable IT as Information system and Technology that is capable of being maintained over a long span of time independent of shifts in both hardware and software. Because the context is characterized by poor infrastructure, lack of skilled and experienced human resources and, a weak information and computer use culture (Walsham et al. 1988) donor support is required but paradoxically also creates a situation of unsustainability. The risk of failure of donor supported IS projects is very high making sustainability a challenging task (Mursu et al. 2000). Sustainability can be seen as a process, starting from the inception of the system, to the various processes around design, development, support and implementation. Sustainability concerns the longevity of these processes and how they co-exist over time, especially once external support is withdrawn (Braa et al. 2003). While sustainability refers to long term outcomes beyond the direct influence of the project, risk analysis typically concerns the threats to the achievement of objectives within the project time frame. A sustainability strategy defines the specific approaches to ensure that the benefits are sustained and specifies how key constraints to sustainability are addressed in the implementation” (Young and Hampshire 2000). In order to realize sustainability of IT systems, organizations need to strengthen factors such as the ability of the systems to provide reliable and useful information as well empower and encourage users at all levels to effectively use the IT systems. The absence of the “participation, capability and motivation of users, coupled with an inflexible system design, makes it difficult for the system to evolve over time and for

institutional changes to be incrementally adapted (Bisbal et al., 1999). Some of the characteristics of sustainable systems include:

- Long term: IT must be able to survive over time
- Demand: The degree to which IT is needed and output it produces
- Simplicity: IT is easy to use with clear functionalities
- Quality: IT must be supplied with quality data
- Responsiveness: IT satisfies users needs and user participation in the development process
- Scalability: IT must be capable of handling and addressing work loads
- Adaptability: IT allows for easy adaptation of technological innovations and improvements
- Stability: IT should be operated by all key actors in the context and Robustness: IT should be fault tolerant in that it may fail without bringing the system down”.

1.2 Statement of the problem

Public, private and Non-Governmental Organizations (NGOs) health-care institutions are currently integrating Information systems and Technology to provide healthcare services. It is perceived that Information systems and Technology brings efficiencies of processes that include data collection, data processing, reporting and effective use of data to inform strategic and timely decision making (Odhiambo-Otieno, 2005; Kimaro & Nhampossa, 2007). Such attempts, if successful, will ultimately enable the realization of the social empowerment which is one of the three pillars of the Kenya’s vision 2030. LVCT is one of the existing Non-Governmental Organization NGOs in Kenya currently providing healthcare services in HIV prevention, with an ultimate goal of reducing HIV infections to zero. LVCT has 24 facilities in Kenya of which twelve (12) are in Nairobi, one (1) in Mombasa and eleven (11) are in Kisumu. Amongst these facilities, only four (4) are currently using Hospital Management Information Systems and Technology to facilitate service provision to its stakeholders. These Hospital Management Information Systems and Technologies, include ADT systems used to dispense drugs from its stores and also manage drugs logistics; IQCARE-(International Quality Care) - the system facilitates patient management and monitoring and BULK SMS System which is a mobile

integrated system that sends SMS reminders to patients who have mHMISsed appointments, as well as reminding them their appointments. The current institution's strategic plan (2017-2018) is to roll-out IQCARE system, ADT system as well as BULKSMS system to more than 24 health facilities throughout Kenya with support from the CDC-funded program, led by palladium group, in collaboration with the Kenya National AIDS & STI Control Programme (NASCOP) (LVCT Health, 2017). However, in addressing this strategic concern, there is need to understand the circumstances that the four (4) facilities are going through in order to inform successful implementation of the institution's strategy on the remaining twenty (20) facilities. It is because of this that the researcher is conducting this research to examine the factors determining the use of Hospital Management Information System and Technology in provision of health-care services amongst NGOs in Kenya.

1.3 General objective

The main objective of this research will be to examine the factors determining the use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya.

1.4 Specific objectives

- i. To establish the influence of performance expectancy on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya
- ii. To determine the influence of effort expectancy on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya
- iii. To establish the influence of social aspects on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya
- iv. To examine the influence of facilitating conditions on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya

- v. To examine the moderating effects of experience on the relationships between the performance expectancy and use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya
- vi. To examine the moderating effects of experience on the relationships between the effort expectancy and use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya
- vii. To examine the moderating effects of experience on the relationships between the social influence and use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya
- viii. To examine the moderating effects of experience on the relationships between the facilitating conditions and use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya
- ix. Propose a framework for establishing the factors that determine use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya

1.5 Research hypotheses

H₁ Performance expectancy has a positive influence on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya

H₂ Effort expectancy has a positive influence on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya

H₃ Social influence has a positive influence on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya

H₄ Facilitating conditions has a positive influence on use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya

H₅ Experience has a significance moderating effects on the relationships between the performance expectancy and use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya

H₆ Experience has a significance moderating effects on the relationship between the effort expectancy and use of Hospital Management Information Systems and Technology in delivery of Health-care services at LVCT

H7 Experience has a significance moderating effects on the relationship between the social influence and use of Hospital Management Information Systems and Technology in delivery of Health-care services at LVCT

H8 Experience has a significance moderating effects on the relationship between the facilitating conditions and use of Hospital Management Information Systems and Technology in delivery of Health-care services at LVCT

1.6 Significance of the study

This research study will provide insight on the Hospital Management Information System factors that lead to use of Information System and Technology in health-care service provision service delivery amongst NGOs in Kenya. This is important since both public and private institutions in Kenya are currently attempting to exploit the opportunities that are related to using Information System and Technology to facilitate service delivery. It focuses on critical aspects required for effective and efficient valuable use of Information system and Technology for health care service delivery.

1.7 Limitations of the study

Although the research findings will provide meaningful implications, this study has some limitations. First, the results will only be drawn from NGOs in Kenya and thus the findings could be applicable to NGOs since they operate on conditions that may not necessarily be similar to those facing public and private entities in Kenya.

1.8 Operational definition of terms

Sustainability: “ability of a system to withstand time and space in provision of expected information services

Healthcare: The maintenance or improvement of health via the prevention, diagnosis, and treatment of disease, illness, injury, and other physical and mental impairments in human beings.

System quality: systems' usability aspects and performance characteristics where the following elements were considered important: ease of usage/learning, integration, flexibility/reliability, functionality, response time, interactivity and adoption.

Information quality: accuracy, completeness, relevance, availability and security.

Service quality: This dimension measures how well the service level is delivered and if it matches the expectations of the users. It focuses on the quality of support accorded to the user of a system.

Intention to use: is determined by two beliefs, namely, perceived ease of use and perceived usefulness, which mediate the effects that external variables have on usage intention

User satisfaction: Measure of Information System Effectiveness

Health Management Information System

Health management Information System are building blocks essential for health strengthening. HMIS is a data collection system specifically designed to support planning, management, and decision making in health facilities and organizations.

Hospital Management Information System

Hospital management Information system is a comprehensive, integrated information system designed to manage all the aspect of a hospital's operation, such as medical, administrative, financial, and legal HMISsues and the corresponding processing of services.

Information system and Technology: The collection of techniques, skills, methods, and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation.

Electronic Medical Record (EMR): An electronic medical record (EMR) is a digital version of all the information you'd typically find in a provider's paper chart: medical history, diagnoses, medications, immunization dates, allergies, lab results and doctor's notes. EMRs are online

medical records of the standard medical and clinical data from one provider's office, mostly used by providers for diagnosis and treatment.

Database: A structured set of data held in a computer, especially one that is accessible in various ways.

Cloud: The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.

Information: The communication or reception of knowledge or intelligence

System: A set of things working together as parts of a mechanism or an interconnecting network

Technology: A manner of accomplishing a task especially using technical processes, dashboards, infrastructure, methods, or knowledge.

Dashboard: Is an information management tool that visually tracks, analyzes and displays key performance indicators (KPI), metrics and key data points to monitor the health of a business, department or specific process.

Internet: A global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols.

Intranet: A local or restricted communications network, especially a private network created using World Wide Web software.

Leveraging: The ability to influence a system, or an environment, in a way that multiplies the outcome of one's efforts without a corresponding increase in the consumption of resources.

Healthcare: The maintenance or improvement of health via the prevention, diagnosis, and treatment of disease, illness, injury, and other physical and mental impairments in human beings".

CHAPTER TWO

LITERATURE REVIEW

2.1 HMIS in Kenyan hospitals

Several research findings have shown the necessity to expand healthcare infrastructure in many developing nations to address concerns related to the extent of gap existing in the urban and rural areas, inadequate number of healthcare professionals as well as continuous decline in the quality of care given in many public healthcare facilities. In the year 2000, the Kenyan doctors to patient ratio was only one doctor for 10,150 people. Unfortunately, seven years later in 2007 the situation deteriorated, with the ratio falling to one doctor per 16,000 people (MoH, 2008). This declined further in 2012 to 1 in 17,000. The goal of HMIS stated in the Annual Health Sector Status Report for 2005-2007 is “to generate and use health information for policy preparation, management, planning, implementation, budgeting, monitoring and evaluation of health services and programme interventions in the health sector.

However, HMIS in Kenya is not delivering on this goal, and hence not improving the quality of healthcare. The Hospital Management Information System at the Ministry headquarters are stand-alone and hence focused on a definite vertical function. The county and district level systems, which provide data to the headquarters, manage health care service units and hospitals at their respective regions. Unfortunately they are also fragmented. The public hospitals have health care quality has not benefited from HMIS. Patients often are faced with lack of vital medicine, shortage of doctors, lack of inpatient beds, and long wait for months before surgery, and sometimes negligence of personnel, not to mention industrial strikes by nurses and doctors.

Within the broader Hospital Information Systems (HIS), Hospital Management Information System (HMIS) is one key component, and actions required of hospital management to support data collection and information generation in Kenya are articulated in specific policy documents. The functionalities of these HMIS include vital registration of births and deaths occurring within the facility as part of integrated population-based national reporting systems. In addition, through facility-specific systems, hospitals should report workloads, cause of illness and death by

department, illness-specific indicators (for example antenatal HIV testing rates), and overall outcomes stratified by age and sex among other indicators. These hospital related data are collected and reported in Kenya using a paper based subsystem, for primary data collection, with summarized data periodically submitted within an electronic subsystem of DHIS2 for centralized aggregation of data.

A research conducted by Kihuba et al. (2014) in conducted in 22 hospitals in Kenya revealed that at hospital level, HMIS departments were generally poorly financed. On average 3% of the total annual income, from cost sharing and government grants, was allocated to the HMIS departments with a range of 1% to 8% compared with a policy requiring that at least 10% should be allocated to information services.

In recent times the need for good information for planning and decision making has gained prominence. The utility of health care utilization data aggregated by the national or county HIS depends on the quality of primary data collection and reporting systems (HMIS) at the health facility level. Study findings indicate this process at hospital level is likely to be undermined by inadequate inputs if these are compared with existing policy guidance. Hospitals were often compliant with requirements for one off exercises such as preparation of annual plans, specific departmental performance objectives, and budgets related to HMIS probably because of the high importance attached to these exercises by the Ministry. However the financial resources allocated to HMIS were low and fell short of the recommended levels, with frequent stock outs of stationery and mandatory reporting templates, and inadequate human resources. Task shifting seemed to be the main strategy used by hospitals in a bid to address the deficits in records officers with nurses taking a leading role in data collection and compilation and employment of temporary records staff on short-term contracts”.

2.2 Health Management Information System

The building blocks of Hospital Management Information System (HMIS) are essential for health system strengthening. They include “Health, Management and Information Systems. HMIS facilitates data collection designed to support planning, management, and decision making in health facilities and organizations.

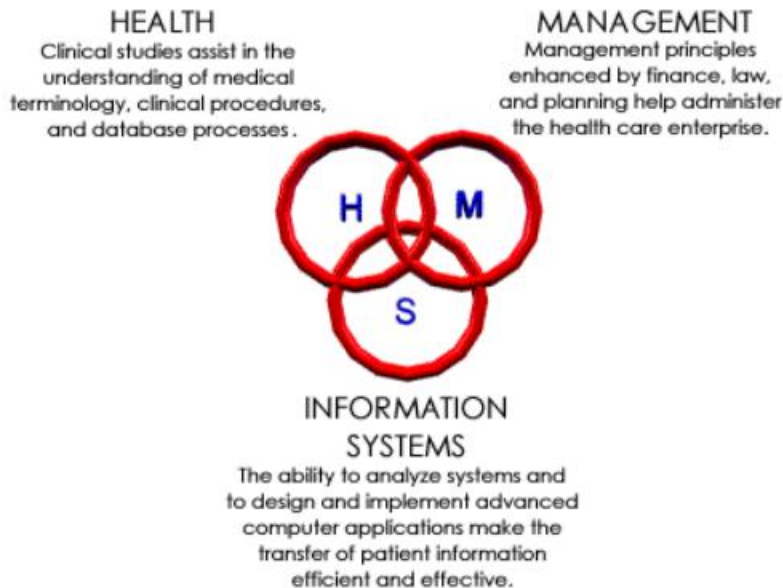


Figure 1: Health Management Information System

It deals with the resources, devices, and methods required to optimize the acquisition, storage, retrieval, and use of information in health and bio medicine. Health informatics tools include not only computers but also clinical guidelines, formal medical terminologies, and information and communication systems. It is applied to the areas of nursing, clinical care, dentistry, pharmacy, public health, occupational therapy, and (bio) medical research.

2.3 Hospital Management Information System

Hospital Management Information System (HMIS) is a comprehensive, integrated information system designed to manage all the aspects of any hospital operations, such as medical, administrative, financial, and legal issues and the corresponding processing of services.



Figure 2: Hospital Management Information System

Hospital Management Information System (HMIS) provides a secure, robust environment for transactions across all departments of the hospital and remote access of patient medical records for physicians and nurses. The system would provide quick response time to the users”.

2.4 HMIS in LVCT Health

LVCT Health has been leveraging in use of Information system and Technology to provide efficient and effective health care services delivery across its offices in Kenya. Some of the EMR’s and HMIS in use include ADT, which is used to dispense antiretroviral drugs to its patients and IQ care which it uses to manage patient register and attendance.

“ARVs work to suppress the viral load and boost the immunity of HIV patients while reducing the risk of opportunistic infections. It’s a complex, life-long treatment that requires strict adherence. Failure to take medication properly can put a patient at risk of developing more severe symptoms, contracting an opportunistic infection, or developing drug resistance. Pharmacist, Doctors and clinicians at LVCT Health clinic, credits the availability of drugs to the use of an Antiretroviral Dispensing Tool (ADT), an easy-to-use electronic pharmacy management software which tracks patient information and monitors the ARVs being prescribed and dispensed.

The ADT tool is being rolled out in more than 24 health facilities throughout Kenya with support from the CDC-funded program, led by palladium group, in collaboration with the Kenya National AIDS & STI Control Programme (NASCO). The data gathered from the tool allow medical staff to accurately forecast the quantity of medicines that will be needed to effectively provide treatment to patients.

Using the ADT tool, healthcare workers confirms an individual patient personal information, medication history, and current prescriptions, then record the name and batch number of the medicine being dispensed to the patient, along with their next scheduled appointment. The ADT tool has also been put to use at Kisumu Tivoli clinic—serving active patients on ARV treatment—where it has been used to increase the quality of patient care, catch errors in prescriptions or patient information, and alert health workers when patients have an appointment or are in danger of running out of ARVs.

Before the antiretroviral dispensing tool, the organisation used a Daily Activity Register—a thick book in which workers would log dispensing information. With the register there was no way to keep track of patients who had missed their appointments or were at-risk of running out of medicine. Monthly reports would take hours, instead of minutes—as they do using the dispensing tool. With the ADT tool, social workers can run a daily report which identifies patients who are running low on ARVs or who may have missed an appointment and flags them for further follow up”.

2.5 Other Literature reviewed

The researcher also reviewed the following literature, including, performance expectancy and technology use, effort expectancy and technology use, social influence and technology use as well as facilitating condition and technology use.

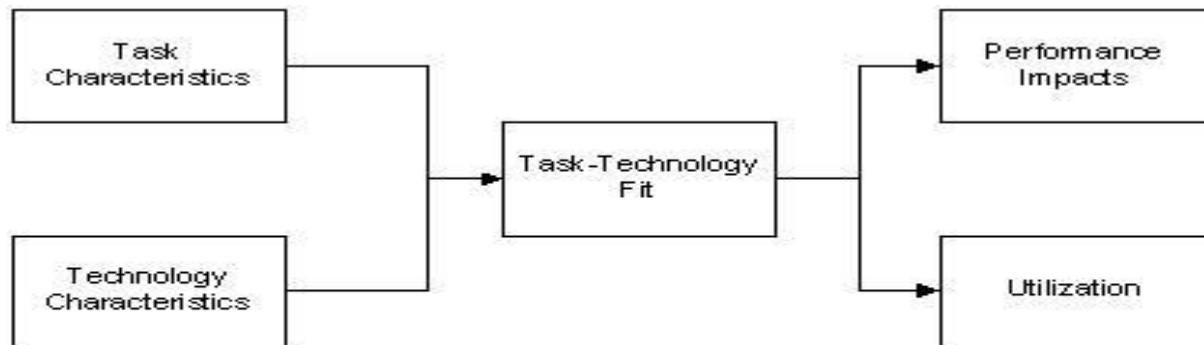
2.6 Challenges facing sustainable HMIS in Kenyan Hospitals

The introduction of Information system and Technology (IT) typically comes with the promise of helping to manage scarce resources, increase efficiencies, reduce workload, and increase work productivity.

In the context of developing countries, the lure of these promises is magnified given the existing conditions and inefficiencies. International donors for example the World Bank, or the World Health Organization play an important role in shaping this promise because developing countries are dependent on them for both technical and financial aspects.

2.7 Review of Theoretical frameworks

2.7.1 Task Technology Fit (TTF)



Source: Goodhue and Thompson, (1995)

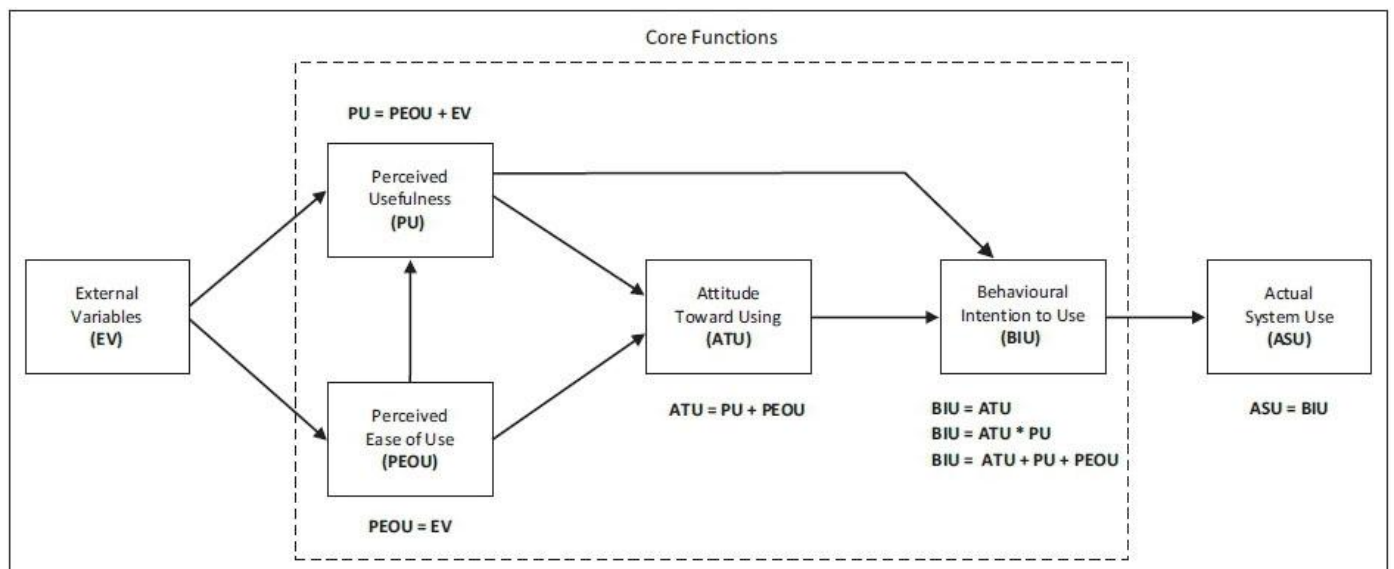
Figure 3: Task Technology Fit (TTF)

The Task Information system and Technology FIT (TTF) is one of the well-known “models in IS used to study the relationship between a system, the task requirements and user needs. This model is based on the idea that when the characteristics of user tasks and characteristics of the information system integrate well together, both system use and user performance will be high. Relationships between factors associated with TTF such as compatibility information (compatibility), understanding the information (meaning) and the ease of information retrieval (locatability) reflect the consistency between the needs of users, or what is called the task requirements and the Information system and Technology used to perform these tasks. Thus, the consistency of the characteristics of the system with the user requirements leads to better performance empirically, the results show that TTF factors directly affect the performance. In other words, the capacity of the system can affect the perceived usefulness in improving user interaction with the system. In this case, individual system ease of use, perceived usefulness and perceived ease of use are linked together. For example, a high quality system provides faster response to users, leading to improvements in the perceived usefulness and performance”.

2.7.2 Technology acceptance model (TAM)

The Technology acceptance model (TAM) is an information systems theory that “models how users come to accept and use an Information system and Technology. The model suggests that when users are presented with a new Information system and Technology, a number of factors influence their decision about how and when they will use it, notably:

- **Perceived usefulness (PU)** – This was defined by Fred Davis as the degree to which a person believes that using a particular system would enhance his or her job performance.
- **Perceived ease-of-use (PEOU)** – Davis defined this as the degree to which a person believes that using a particular system would be free from effort" (Davis 1989).



Source: Adapted from Davis et al. (1989).

FIGURE 1: Technology acceptance model.

Figure 4: Technology acceptance model (TAM)

2.7.3 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT model explains that the acceptance of Information system and Technology is based on eight Information system and Technology acceptance theories or models. In particular, “UTAUT draws on the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behavior (TPB), the combined TAM and TPB, the model of Personal Computer Utilization, the Innovation Diffusion Theory and the Social Cognitive Theory (Venkatesh et al.2003). At the core, the UTAUT model uses behavioral intentions a predictor of the Information system and Technology use behaviour. The included predictors of behavioral intention are based on the components the eight Information system and Technology adoption models reviewed.

UTAUT Model is as shown below

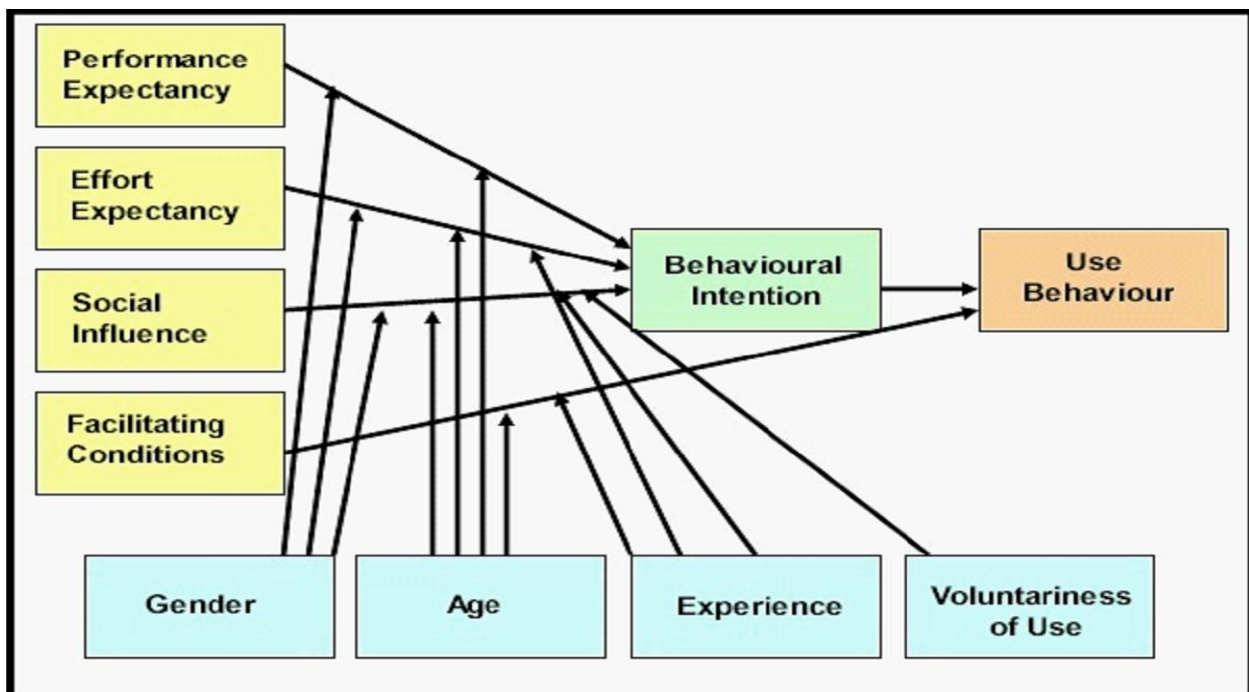


Figure 5: Unified Theory of Acceptance and Use of Technology (UTAUT)

Performance Expectancy

The degree to which an individual believes that using the system will help him or her to attain gains in job performance.

Effort Expectancy

The degree of ease associated with the use of the system.

Social Influence

The degree to which an individual perceives that important others believe he or she should use the new systems.

Facilitating Conditions

Refer to consumers' perceptions of the resources and support available to perform a behavior".

2.8 Conceptual framework

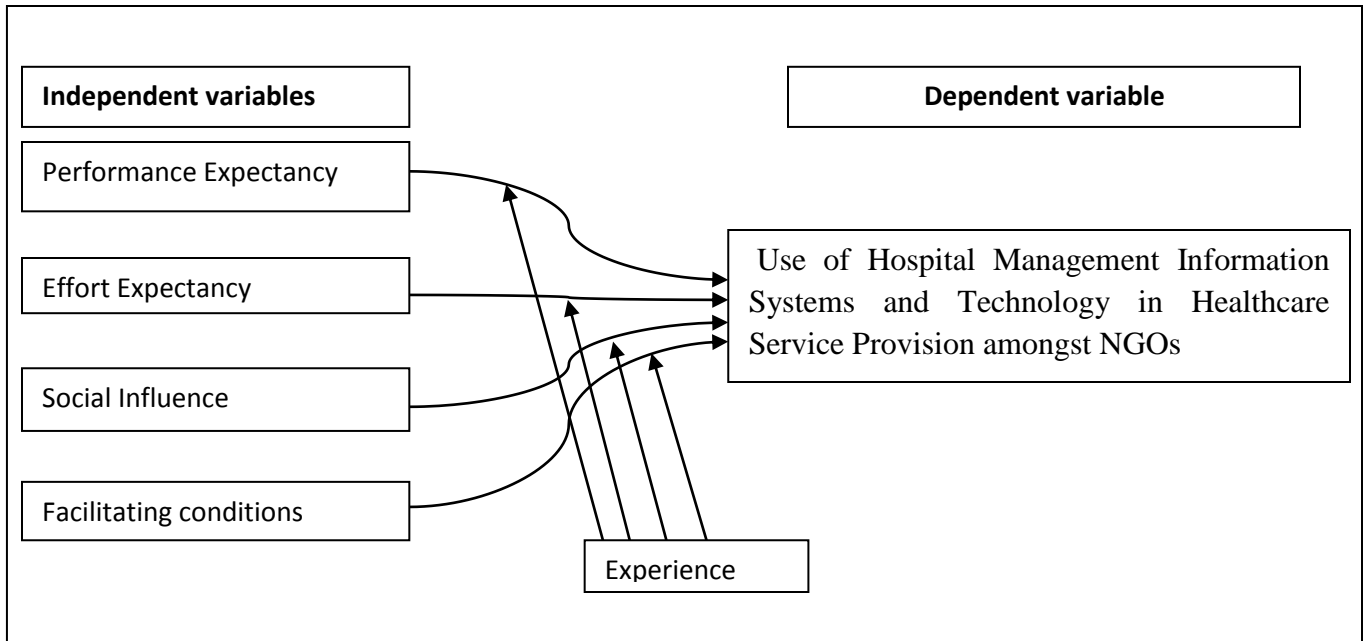


Figure 6: Conceptual framework

The variables included in the conceptual framework were drawn from the variables of the UTAUT model. These include “performance expectancy, effort expectancy, social influence and facilitating Conditions. Performance expectancy is referred to as the degree to which an individual believes that using the system and technology will help him or her to attain gains in job performance. Effort expectancy refers to the extent of convenience perceived for using system. Additionally, social factors refers to the degree to which an individual perceives that other ones are important to him/her in using new system or technology. Furthermore, facilitating conditions refer to the extent to which an individual perceives that technical and organizational infrastructure required to use intended system are available”.

The dependent variable in this study was the use of Hospital management Information Systems and Technology in Healthcare Service Provision amongst NGOs. These systems and technologies include ADT, IQCARE, Total Queue Clinic Ticket system and Bulk SMS.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research philosophy, research design, population of the study, sample size, sample design, and data collection methods that will be used to assess the influence of hospital Management Information System capability on use of Information system and Technology in Healthcare service provision amongst Non-Governmental Organizations' in Kenya, at LVCT. Questionnaires and interviews will be used as instruments of data collection. The study will be guided by objectives namely: To establish the influence of performance expectancy on use of hospital management information systems and Technology to deliver health-care services at LVCT; to determine the influence of effort expectancy on use of hospital management Information systems and Technology to deliver health-care services at LVCT; to examine the influence of social aspects on use of hospital management information systems and Technology to deliver health-care services at LVCT; to examine the influence of facilitating conditions on use of hospital management Information systems and Technology to deliver health-care services at LVCT; to examine the moderating effects of attitude on the relationships between the performance expectancy on use of hospital management information system and Technology to deliver health-care services at LVCT; to examine the moderating effects of experience on the relationships between the effort expectancy and use of hospital management information system and Technology to deliver health-care services at LVCT; to examine the moderating effects of experience on the relationships between the social influence and use of hospital management information system and Technology to deliver health-care services at LVCT; to examine the moderating effects of experience on the relationships between the facilitating conditions and use of hospital management information system and Technology to deliver health-care services at LVCT and finally to propose a framework that can be used to measure the effect of Information System capability on use of hospital management information system and Technology in Healthcare service provision amongst Non-Governmental Organizations' in Kenya.

3.1.1 LVCT Health

“LVCT Health is an indigenous Kenyan Non-Governmental and not-for-profit organization established in 2001. The institution’ goal is to drive Kenya towards HIV prevention, with an ultimate goal of reducing HIV infections to zero by offering integrated HIV services through development of models that are scaled up to the national models. They also carry out sexual and reproductive health research - translating our research to policy and practice; providing evidence for HIV policy reforms and service delivery; and developing capacities of indigenous organizations in building sustainable human resources for community HIV Prevention. They give special attention to those with greatest vulnerability to infection and with special service needs - including survivors of sexual violence, persons living with disabilities, men who have sex with men, Youth and Sex Workers. Our offices are in Nairobi, Western Region, Eastern and Central Region and Rift Valley”.

3.2 Research Philosophy

Positivism, interpretivist and pragmatism are the three research philosophies that can be utilized to guide a research study. Benbasat et al. (1987) explains that “no single research methodology is intrinsically better than the other methodology, and hence the reason for many authors calling for a combination of research methods in order to improve the quality of research”. This research adopted the pragmatism philosophy. This is because pragmatism allows the combination of both positivism and interpretivist. This approach will allow adequate answering of all research questions. One approach may be ‘better’ than the other for answering particular research question/objective as well as instances where questions are not explicitly positivist or interpretivist philosophy.

Tashakkori and Teddlie (1998) suggest that “it is more appropriate for the researcher in a particular study to think of the philosophy adopted as a continuum rather than opposite positions. At some point the knower and the known must be interactive, while at others, one may more easily stand apart from what one is studying, (Tashakkori and Teddlie, 1998:26). Pragmatism is intuitively appealing largely because it avoids the researcher engaging in what they see as rather pointless debates about such concepts as truth and reality. In their view you should study what interests you and is of value to you, study in the different ways in which you deem appropriate,

and use the results in ways that can bring about positive consequences within your value system”, (Tashakkori & Teddlie, 1998).

3.3 Research Choices/Approach

This study adopted the deductive approach. In deductive approach, hypotheses and research design is carefully developed and tested against the adopted framework (Collis and Hussey, 2003).

3.4 Research Design

The study employed a mixed method research design of both qualitative and quantitative designs. The reason for using descriptive research is to depict the existing state of affairs. According to Kothari (2004), studies concerning individuals, groups or situations with the aim of obtaining complete and accurate information are best done using descriptive studies. The researcher has no control over the variables instead will report the situation as it is (Kothari 2004). The researcher must also clearly define the objectives that he/she wants to measure as well as design adequate methods of measuring each of the objectives with clear definition of population under study. Kothari (2004), explains that the design must focus on the following: formulating the objectives of the study; designing data collection methods; choosing the sample; collecting data, processing as well as further analysis to facilitate reporting the findings. In this case the study looked into the Hospital Management Information System factors that would ultimately lead to effective and efficient utilization of Information system and Technology amongst NGOs in provision of health-care services.

3.5 Study Site

This study will be conducted at the four (4) of LVCT facilities in Kenya. These are LVCT Headquarters in Hurlingam - Nairobi, LVCT Tivoli in Kisumu, LVCT Naselica – Kisumu and finally LVCT Commercial house in Nairobi CBD.

3.6 Target Population

The total population in this study was 124 respondents. The sample size was 104 respondents arrived at by employing stratified sampling where respondents were classified according to their

departments. This was then followed by purposive sampling where a census of all respondents (104) in the departments deemed to be using the hospital management information systems and Technology were included in the study. The target population is a group of individuals or object having characteristics that can be observed and measured (Mugenda and Mugenda, 2003). The target population was distributed as depicted in the Table below.

Table 1: Distribution of the target population at LVCT Health

| S.No | Section/designation | Total |
|---------------------------------|----------------------------|--------------|
| 1. | ICT staff | 10 |
| 2. | Care Clinic Division | 44 |
| 3. | M&E division | 10 |
| 4. | Senior Management | 5 |
| 5. | Statistician | 6 |
| 6. | Regional Doctors | 10 |
| 7. | Research Division | 10 |
| 8. | Support Staff | 20 |
| TOTAL NO. OF RESPONDENTS | | 124 |

Source: Researcher, 2018

3.7 Sampling Design

This study will employ purposive sampling where only system users will be sampled to participate in the study.

3.8 Data Collection Instruments

The researcher will employ both questionnaires and interviews as instruments of data collection. Data collection “refers to the process of gathering information to serve or prove some facts” (Kombo & Tromp, 2006).

3.8.1 Questionnaires

Questionnaires always seem to provide a logical and easy way of collecting data from respondents. However, they may prove difficult to design and obtain the required information based on the responses from the respondents. The questionnaires should therefore be designed in

a manner that the questions will be clear and for easier reliability and data management (Saunders, Lewis & Thornhil, 2011). Kumar (2005) observes that a questionnaire is a written list of questions which requires answers to be recorded by respondents. The questionnaire for this study will be designed based on the research objectives.

3.8.2 Interviews

Interviews will also be carried out with the respondents targeted for the study. Interviews were recorded for better future reference and memory. An interview schedule will be drawn up that will entail both closed and open ended questions.

The interviews will help to understand Information system and Technology usage amongst health-care NGOs in Kenya.

3.9 Data Analysis

The analysis of data in the factors determining the use of Hospital Management Information System and Technology in provision of healthcare service delivery amongst NGO’s in Kenya, at LVCT health will employ descriptive, correlation and simple regression data analysis models. These will be used to establish the multiple regression coefficient and correlation coefficients and differences between extents of the relationship between Hospital Management Information System capability and sustainable use of Technology at LVCT health in Kenya. The beta (β) coefficients for each independent variable generated from the model will be subjected to regression analysis that will be used to test the effect of Hospital Management Information Systems and Technology capability on sustainable use of Information system and Technology at LVCT health as shown below.

$$\begin{aligned}
 Y &= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e \dots\dots\dots 1 \\
 y &= \beta_0 + \beta_1X_1 + \varepsilon \dots\dots\dots 2 \\
 y &= \beta_0 + \beta_2X_2 + \varepsilon \dots\dots\dots 3 \\
 y &= \beta_0 + \beta_3X_3 + \varepsilon \dots\dots\dots 4 \\
 y &= \beta_0 + \beta_4X_4 + \varepsilon \dots\dots\dots 4
 \end{aligned}$$

y Sustainable use of Hospital management Information System and Technology at LVCT health

β_0 Is the constant

X_1 Performance Expectancy

X_2 Effort Expectancy

X_3 Social aspects

X_4 Facilitating Conditions

$\beta_1 - \beta_4$ Are the coefficient regression or change induced in y by change in x

ϵ error term

Figure 7: Multiple Regression Formula

3.91 Operationalization of the Research Variables

Operationalization is the process of defining both dependent and independent variables into quantifiable factors. The process defines concepts and allows them to be measured, empirically and quantitatively. The variable factors considered under each of the independent variables are shown in Table 3 below.

Table 2: “Independent and Dependent Variables

| No. | Independent variables | Perceived factors | Dependent variable |
|------------|------------------------------|--|--|
| 1. | Performance expectancy | The degree to which an individual believes that using the system will help him or her to attain gains in job performance | Use of Hospital Management Information systems and Technology for provision of health-care services at LVCT health |
| 2. | Effort expectancy | The degree of ease associated with the use of the system. | Use of Hospital Management Information systems and Technology for provision of health-care services at LVCT health |
| 3. | Social influence | The degree to which an individual perceives that important others believe he or she should use the new systems. | Use of Hospital Management Information systems and Technology for provision of health-care services at LVCT health |
| 4 | Facilitating conditions | Refer to consumers’ perceptions of the resources and support available to perform a behavior | Use of Hospital Management Information systems and Technology for provision of health-care services at LVCT health”. |

Source: Venkatesh et al. (2003)

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of the analyzed data obtained through various analysis techniques. As indicated in the research design, due to the nature of the study both qualitative and quantitative methods were used. The data obtained from the study has been clearly tabulated, analyzed, and presented using SPSS version 21.0 analytical tool.

Table 3: Table showing number of questionnaires returned

| No. of questionnaires issued | No. of questionnaires returned | Response rate (%) |
|------------------------------|--------------------------------|-------------------|
| 104 | 92 | 88.46% |

4.2 Summary of Responses

Data collection was carried out in four LVCT branches. These are LVCT HQ, LVCT Tivoli in Kisumu, LVCT CBD in Nairobi and LVCT Naselica in Kisumu. The results from the respondents were analyzed to determine the factors influencing the use of Hospital Management Information Systems and Technology in Healthcare service delivery amongst Non-Governmental Health Organizations in Kenya: A case study of LVCT, Kenya. Out of these 92 respondents, 47 of them representing 51.65% were drawn from Nairobi HQ branch, 19 respondents representing 20.88% were drawn from Kisumu Tivoli branch, 13 respondents representing 14.29% were drawn from Nairobi CBD and finally 12 respondents representing 13.19% were drawn from Kisumu Naselica branch. The chart below depicts the above explained distribution of respondents.

| Name of Station | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------------|-----------------|-----------|---------|---------------|--------------------|
| Valid | HQ | 47 | 51.1 | 51.6 | 51.6 |
| | Kisumu Tivoli | 19 | 20.7 | 20.9 | 72.5 |
| | Nairobi CBD | 13 | 14.1 | 14.3 | 86.8 |
| | Kisumu Naselica | 12 | 13.0 | 13.2 | 100.0 |
| | Total | 91 | 98.9 | 100.0 | |
| MHMISsing | System | 1 | 1.1 | | |
| Total | | 92 | 100.0 | | |

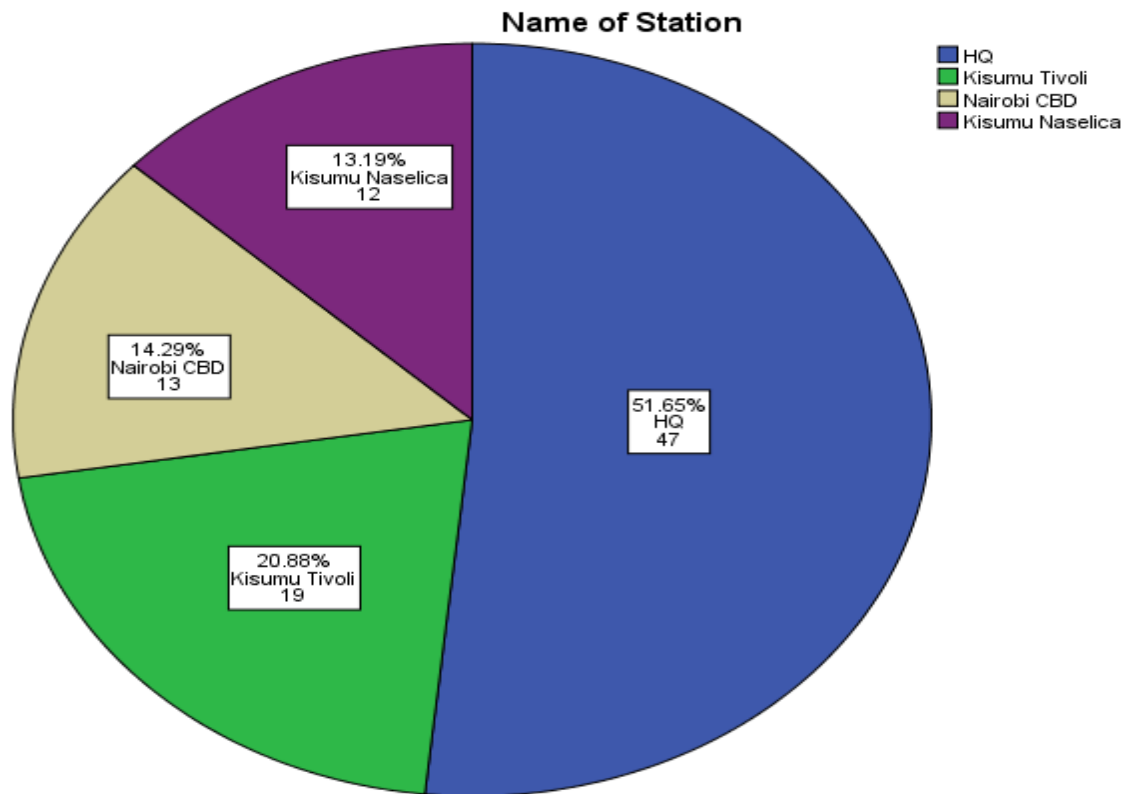


Figure 8: Distribution of respondents

4.3 Descriptive Analysis of Independent Variable

4.3.1 Performance Expectancy

The respondents were tasked to rate the metrics of performance expectancy in a Likert scale of 1-5. In this scale, 1 represented Strongly Disagree and 5 representing Strongly Agree. The descriptive analysis for the independent variable – performance expectancy is as shown in the Table 4 below:

**Table 4: Performance expectancy
Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---------------------|-------------------|----|
| It is useful for me to use of Total Queue, ADT & IQ Care in my work | 4.48 | .620 | 92 |
| Use of Total Queue, ADT & IQ Care enables me accomplish tasks quickly | 4.43 | .716 | 92 |
| Use of Total Queue, ADT & IQ Care enables me increase my productivity | 4.46 4.46 | .670 | 92 |
| Valid N (listwise) | | | 92 |

Source (Research data, 2018)

The respondents generally agreed that the use of HMISs and Technology is will generally improve performance as shown above. The following aspects were asked: It is useful for me to use of Total Queue, ADT & IQ Care in my work (M=4.48, SD=0.620), Use of Total Queue, ADT & IQ Care enables me accomplish tasks quickly (M=4.43, SD=.716), Use of Total Queue, ADT & IQ Care enables me increase my productivity (M=4.46, SD=0.670), The analysis shows that majority of respondents agreed that the use of HMIS and Technology generally improves the performance of individual employee and generally the organization.

4.3.2 Effort expectancy

This was the second independent variable. The study revealed effort expectancy is a very strong reason for use of HMIS and Technology in NGOs. Its average mean of 4.51. The respondents were asked to rate the aspects of effort expectancy and the results are presented in Table below.

Table 5: Descriptive statistics on effort expectancy

Descriptive Statistics

| | Mean | Std. Deviation | N |
|--|-------------|----------------|----|
| My interactions with Total Queue, ADT & IQCare is clear and understandable | 4.48 | .620 | 92 |
| Easy for me to become skillful while using Total Queue, ADT & IQCare | 4.55 | .562 | 92 |
| It easy to use Total Queue, ADT & IQCare at LVCT | 4.46 | .619 | 92 |
| It is easy to learn and use Total Queue, ADT & IQCare at LVCT | 4.55 | .562 | 92 |
| Valid N (listwise) | 4.51 | | 92 |

Source: Research Data 2018

The metrics that were used to measure this variable were My interactions with Total Queue, ADT & IQCare is clear and understandable (M=4.48, SD=0.620), Easy for me to become skillful while using Total Queue, ADT & IQCare (M=4.55, SD=0.562), It easy to use Total Queue, ADT & IQCare at LVCT (M=4.46, SD=0.619) and finally It is easy to learn and use Total Queue, ADT & IQCare at LVCT (M=4.55, SD=0.562).

4.3.3 Social influence

The study also sought to determine aspects of social influence on use of HMISs and Technology. The respondents that were drawn from the four branches generally agreed (M=4.42 and Std. Deviation=0.780) that the social influence determine the use of HMISs and Technology amongst NGOs in Kenya. The following metrics were used to determine this particular variable: Peers influence my decision to use Total Queue, ADT & IQCare at LVCT (M=4.39, SD=0.770), Use of Total Queue, ADT & IQCare at LVCT is influenced by my supervisors (M=4.33, SD=1.007) as well as My supervisors have been helping me use LVCT Total Queue, ADT & IQCare (M=4.53, SD=0.564). The table below shows descriptive analysis of this variable.

Table 6: Descriptive statistics on social influence

| Descriptive Statistics | | | |
|--|-------------|----------------|----|
| | Mean | Std. Deviation | N |
| Peers influence my decision to use Total Queue, ADT & IQCare at LVCT | 4.39 | .770 | 92 |
| Use of Total Queue, ADT & IQCare at LVCT is influenced by my supervisors | 4.33 | 1.007 | 92 |
| My supervisors have been helping me use LVCT Total Queue, ADT & IQCare | 4.53 | .564 | 92 |
| Average | 4.42 | | 92 |

4.3.3 Facilitating conditions

The study also sought to determine facilitating conditions and the influence on use of HMISs and Technology amongst NGOs in Kenya. The respondents that were drawn from the four branches strongly agreed (M=4.55 and Std. Deviation=0.547) that the facilitating conditions are important in NGOs. The following metrics were used to determine this particular variable: Availability of h/w, s/w and networks has enabled me utilize LVCT Total Queue, ADT & IQCare (M=4.52, SD=0.583), Knowledge and skills on use of LVCT Total Queue, ADT & IQCare enables me deliver services (M=4.57, SD=0.561) as well as Presence of ICT assistance on use of LVCT Total Queue, ADT & IQCare (M=4.58, SD=0.497) as shown in Table below.

Table 7: Descriptive statistics on facilitating conditions

| Descriptive Statistics | | | |
|---|-------------|----------------|----|
| | Mean | Std. Deviation | N |
| Availability of h/w, s/w and networks has enabled me utilize LVCT Total Queue, ADT & IQCare | 4.52 | .583 | 92 |
| Knowledge and skills on use of LVCT Total Queue, ADT & IQCare enables me deliver services | 4.57 | .561 | 92 |
| Presence of ICT assistance on use of LVCT Total Queue, ADT & IQCare | 4.58 | .497 | 92 |
| Average Mean and SD | 4.55 | .547 | 92 |

4.3.4 Intervening Variable – Moderating effect of experience on the relationship between Performance expectancy and use of hospital management Information systems and Technology

Table below presents the results of experience as an intervening variable between performance expectancy and use of HMISs and Technology. The respondents strongly agreed that experience positively moderates performance while using Technology. The metrics used to measure this variable are as follows: My experience enables me better use the LVCT Total Queue, ADT & IQCare (M=4.57, SD=0.520), My IT savvy experience enables me better utilize LVCT Total

Queue, ADT & IQCare (M=4.59, SD=.577), as well as my healthcare systems experience enables me perform better while using LVCT Total Queue, ADT & IQCare (M=4.64.SD=.482) as shown on Table 8 below.

Table 8: Descriptive statistics on Intervening variable – experience

Descriptive Statistics

| | Mean | Std. Deviation | N |
|---|-------------|----------------|----|
| My experience enables me better use the LVCT Total Queue, ADT & IQCare | 4.57 | .520 | 92 |
| My IT savvy experience enables me better utilize LVCT Total Queue, ADT & IQCare | 4.59 | .577 | 92 |
| My healthcare systems experience enables me perform better while using LVCT Total Queue, ADT & IQCare | 4.64 | .482 | 92 |
| Average | 4.60 | .526 | 92 |

Source: Research Data 2018

4.3.5 Intervening Variable – Moderating effect of experience on the relationship between effort expectancy and use of hospital management Information systems and Technology

The Table below represents the results of experience as an intervening variable. Respondents generally agreed (mean of 4.32) that experience moderates the effort applied while using HMISs and Technology amongst NGOs. The following metrics were used to measure the variable include: My experience in using LVCT Total Queue, ADT & IQCare enables me use less effort (M=4.35.SD=0.791), My IT savvy experience enables me better utilize systems (M=4.36, SD=0.944) and my experience in using systems enables me put less effort in utilizing ICT (M=4.25, SD=0.956) as shown in Table below.

Table 9: Descriptive statistics on Intervening variable – experience on effort expectancy

Descriptive Statistics

| | Mean | Std. Deviation | N |
|--|-------------|----------------|----|
| My experience in using LVCT Total Queue, ADT & IQCare enables me use less effort | 4.35 | .791 | 92 |
| My IT savvy experience enables me better utilize systems | 4.36 | .944 | 92 |
| My experience in using systems enables me put less effort in utilizing ICT | 4.25 | .956 | 92 |
| Average | 4.32 | .897 | 92 |

Source: Research Data 2017

4.3.6 Intervening Variable – Moderating effect of experience on the relationship between Effort expectancy and use of hospital management Information systems and Technology

The Table 10 below represents the results of experience as an intervening variable. Respondents strongly agreed (mean of 4.57) that experience moderates the relationship between social influence and use of HMISs and Technology amongst NGOs. The metrics used to measure the variable included: My experience in using LVCT Total Queue, ADT & IQCare enables me be above peers (M=4.59, SD=0.577), My experience in h/w, s/w and systems enables me utilize LVCT Total Queue, ADT & I Care (M=4.54, SD=0.636). The descriptive analysis is as shown on Table below.

Table 10: Descriptive statistics on Intervening variable – experience on social influence

Descriptive Statistics

| | Mean | Std. Deviation | N |
|---|-------------|----------------|----|
| My experience in using LVCT Total Queue, ADT & IQCare enables me be above peers | 4.59 | .577 | 92 |
| My experience in h/w, s/w and systems enables me utilise LVCT Total Queue, ADT & IQCare | 4.54 | .636 | 92 |
| Average | 4.57 | .607 | 92 |

Source: Research Data 2018

4.3.7 Intervening Variable – Moderating effect of experience on the relationship between facilitating conditions and use of hospital management Information systems and Technology

The Table below represents the results of experience as an intervening variable. Respondents strongly agreed (mean of 4.60) that experience on use of technology promotes the use of HMISs and Technology amongst NGOs. The metrics used to measure the variable included: My experience in LVCT Total Queue, ADT & IQCare enables me utilize IT infrastructure (M=4.57, SD=0.561), My IT savvy knowledge enables me utilize infrastructure thus use of ICT (M=4.61,SD=0.491) and my experience in healthcare service systems enables me put less effort (M=4.62, SD=0.488). The analysis is as shown on Table below.

Table 21: Descriptive statistics on Intervening variable – experience – facilitating conditions

Descriptive Statistics

| | Mean | Std. Deviation | N |
|--|-------------|----------------|-----------|
| My experience in LVCT Total Queue, ADT & IQCare enables me utilize IT infrastructure | 4.57 | .561 | 92 |
| My IT savvy knowledge enables me utilize infrastructure thus use of ICT | 4.61 | .491 | 92 |
| My experience in healthcare service systems enables me put less effort | 4.62 | .488 | 92 |
| Average | 4.60 | .513 | 92 |

Source: Research Data 2017

4.3.5 Dependent Variable – Use of Hospital Management Information System and Technology

The Table below presents the results of dependent variable – Use of Hospital Management Information Systems and Technology amongst NGOs in Kenya. Respondents strongly (mean of 4.54) that LVCT uses HMISs and Technology in delivery of Healthcare services. The metrics used to measure the variable included: Use of LVCT Total Queue, ADT & IQCare facilitates efficient service delivery (M=4.54, SD=0.582), Use of LVCT Total Queue, ADT & IQCare facilitates efficient management of patients data (M=4.58, SD=0.519), Use of LVCT Total Queue, ADT & IQCare is in line with policy and strategy (M=4.50, SD=0.503), Use of LVCT Total Queue, ADT & IQCare facilitates Business Intelligence and Data Analytics (M=4.57, SD=0.498), Use of LVCT Total Queue, ADT & IQCare has improved financial and Admin performances (M=4.38, SD=0.644), Use of LVCT Total Queue, ADT & IQCare has enhanced patient satisfaction (M=4.61, SD=0.554) and finally Use of LVCT Total Queue, ADT & IQCare has made operations effective (M=4.61, SD=0.573) as shown on the Table below.

Table 32: Dependent variable – Use of IS and Technology

Descriptive Statistics

| | Mean | Std. Deviation | N |
|--|-------------|----------------|-----------|
| Use of LVCT Total Queue, ADT & IQCare facilitates efficient service delivery | 4.54 | .582 | 92 |
| Use of LVCT Total Queue, ADT & IQCare facilitates management of patients data | 4.58 | .519 | 92 |
| Use of LVCT Total Queue, ADT & IQCare is in line with policy and strategy | 4.50 | .503 | 92 |
| Use of LVCT Total Queue, ADT & IQCare facilitates Business Intelligence and Data Analytics | 4.57 | .498 | 92 |
| Use of LVCT Total Queue, ADT & IQCare has improved financial and Admin performances | 4.38 | .644 | 92 |
| Use of LVCT Total Queue, ADT & IQCare has enhanced patient satisfaction | 4.61 | .554 | 92 |
| Use of LVCT Total Queue, ADT & IQCare has made operations effective | 4.61 | .573 | 92 |
| Average | 4.54 | .553 | 92 |

Source: Research Data 2018

4.4 Reliability Analysis

4.4.1 Cronbach's Alpha Reliability Analysis

This is the “degree to which an assessment tool produces stable and consistent results. This tested whether the instruments that were used to establish the factors influencing the use of Hospital Management Information System and Technology in Healthcare service delivery amongst NGOs in Kenya. A Cronbach's Alpha test was carried to test the reliability. In instances where coefficient was closer to one (1), it indicates that the tested factor was valid and consistent in measuring use of Hospital Management Information System and Technology in Healthcare service delivery. George and Mallory’s (2003) similarly noted that the rule of the thumb is that any result above 0.7 is acceptable. The results of reliability tests are as shown in the Table 12 below.

Table 43: Cronbach's alpha reliability analysis

| Variable | Reliability Statistics | |
|--------------------------------------|------------------------|------------|
| | Cronbach's Alpha | N of Items |
| Performance Expectancy | .874 | 3 |
| Effort Expectancy | .819 | 4 |
| Social Influence | .680 | 3 |
| Facilitating conditions | .712 | 3 |
| Experience – Performance expectancy | .755 | 3 |
| Experience – Effort expectancy | .939 | 3 |
| Experience – Social Influence | .678 | 2 |
| Experience – Facilitating conditions | .773 | 3 |
| Use of IS and Technology | .848 | 7 |

Source: Research data 2017

4.5 Correlation Analysis

The researcher conducted correlation analysis to test the relationship of independent and dependent variables using the Pearson Correlation method. This was carried out in order to quantify the strength and direction of the relationship between the variables. Pearson correlation coefficient measures the strength of a linear association between two variables i.e. independent variables and dependent variable and is denoted by r . Pearson correlation coefficients range from -1 to +1. Negative value indicates negative correlation/relationship and positive values indicates

positive correlation/relationship. A positive r value expresses a positive relationship between the two variables (the larger the independent variable, the larger the dependent variable) while a negative r value indicates a negative relationship (the larger the independent variable, the smaller/lesser the dependent variable).

Furthermore, the rule is always If the Sig (2-Tailed) value is greater than 0.05, it can always be concluded that there is no statistically significant correlation/relationship between variables”. The research findings showed that performance expectancy, effort expectancy, social influence and facilitating conditions has positive correlation coefficients of ($r=.401^{**}$, $r=.570^{**}$ a, $r=.287^{**}$ $r=.618^{**}$) respectively. The intervening variable experience also has positive correlation coefficients of ($r=.524$, $r=.118^{**}$ a, $r=.589^{**}$, $r=.598^{**}$) respectively. All the independent and intervening variables had their levels of significance being strong Sig. (2 tailed) of $p<0.05$. This meant that the four independent variables and the moderating variable except on effort expectancy were statistically significant in terms of relationship to the use of Hospital Management Information System and Technology in Healthcare service delivery amongst NGOs in Kenya. “Table below shows the Pearson correlation analysis.

Table 14: “Correlations Table

| | | Correlations | | | | | | | | |
|---|---------------------|------------------------|-------------------|------------------|-------------------------|-----------------------------------|------------------------------|------------------------------|------------------------------------|---|
| | | Performance Expectancy | Effort Expectancy | Social Influence | Facilitating Conditions | Experience performance Expectancy | Experience Effort Expectancy | Experience Social Expectancy | Experience Facilitating Conditions | Utilisation of ICT in Healthcare service delivery |
| Performance Expectancy | Pearson Correlation | 1 | | | | | | | | |
| | Sig. (2-tailed) | | | | | | | | | |
| | N | 92 | | | | | | | | |
| Effort Expectancy | Pearson Correlation | .461** | 1 | | | | | | | |
| | Sig. (2-tailed) | .000 | | | | | | | | |
| | N | 92 | 92 | | | | | | | |
| Social Influence | Pearson Correlation | .202 | .274** | 1 | | | | | | |
| | Sig. (2-tailed) | .053 | .008 | | | | | | | |
| | N | 92 | 92 | 92 | | | | | | |
| Facilitating Conditions | Pearson Correlation | .409** | .605** | .487** | 1 | | | | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | | | | | | |
| | N | 92 | 92 | 92 | 92 | | | | | |
| Experience performance Expectancy | Pearson Correlation | .326** | .471** | .310** | .691** | 1 | | | | |
| | Sig. (2-tailed) | .002 | .000 | .003 | .000 | | | | | |
| | N | 92 | 92 | 92 | 92 | 92 | | | | |
| Experience Effort Expectancy | Pearson Correlation | .167 | -.004 | .489** | .425** | .303** | 1 | | | |
| | Sig. (2-tailed) | .112 | .969 | .000 | .000 | .003 | | | | |
| | N | 92 | 92 | 92 | 92 | 92 | 92 | | | |
| Experience Social Expectancy | Pearson Correlation | .406** | .575** | .457** | .595** | .611** | .256* | 1 | | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .014 | | | |
| | N | 92 | 92 | 92 | 92 | 92 | 92 | 92 | | |
| Experience Facilitating Conditions | Pearson Correlation | .387** | .545** | .527** | .665** | .603** | .401** | .527** | 1 | |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | | |
| | N | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | |
| Utilisation of ICT in Healthcare service delivery | Pearson Correlation | .401** | .570** | .287** | .618** | .524** | .118 | .589** | .598** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .006 | .000 | .000 | .262 | .000 | .000 | |
| | N | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Research data 2018”.

4.6 Regression Analysis

Multiple regression analysis was conducted to establish the causal relationship of independent variables and dependent variable. The study used SPSS version 21 to code, enter and compute multiple regression. R^2 “is a statistical term saying how good one or many terms (independent variables) is at predicting another (dependent variable). The rule is always if R-Square (R^2) is 1.0 then given the value of one term, you can perfectly predict the value of another term. If R^2 is 0.0, then knowing one term does not help to know the other term at all. More generally, a higher value of R-Square means that you can better predict one term from another.

Combining the four independent variables (Performance expectancy, Effort expectancy, social influence and facilitating conditions) contributed 0.672 R and R –square of 0.452. This means that the four independent variables contribute 45.2% to the use of Hospital Management Information System (IS) and Technology in delivery of healthcare services amongst NGOs in Kenya. The analysis further showed that independent variables were highly significant in contributing to dependent variable at significance level of 0.000 as shown in the Sig. F Change in the Anova and model summary. The regression analysis shows that there exist other factors contributing (54.8%) to the use of Hospital Management Information Systems and Technology in delivery of healthcare services amongst NGOs in Kenya.

Table 15: Regression analysis Table

| Model Summary | | | | | | | | | |
|----------------------|-------------------|-------------|-------------------|----------------------------|--------------------------------------|----------|-----|-----|---------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .672 ^a | .452 | .427 | .30413 | .452 | 17.945 | 4 | 87 | .000 |

a. Predictors: (Constant), Facilitating Conditions, Performance Expectancy, Social Influence, Effort Expectancy

Source: Researcher, 2017

ANOVA Interpretation

ANOVA table shows that the sum of squares of the regression is 6.640 at 4 degrees of freedom and a mean square of 1.660. The residual sum of squares is 8.047 with 87 degrees of freedom and mean square value of 0.092. The Total sum of squares is 14.687 with 91 degrees of freedom. The test for the joint significant which is given by the F statistic is 17.945 and is seen in the table below it is statistically significant at .000 percent level of significance. This implies that the independent variables, that is, performance expectancy, effort expectancy, social influence and facilitating conditions jointly explain the use of Hospital Management Information Systems and Technology in delivery of healthcare services amongst NGOs in Kenya. The Anova analysis is shown in Table below.

Table 16: ANOVA

| ANOVA^a | | | | | | |
|---|------------|----------------|----|-------------|--------|-------------------------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 6.640 | 4 | 1.660 | 17.945 | .000^b |
| | Residual | 8.047 | 87 | .092 | | |
| | Total | 14.687 | 91 | | | |
| a. Dependent Variable: Utilisation of ICT in Healthcare service delivery | | | | | | |
| b. Predictors: (Constant), Facilitating Conditions, Performance Expectancy, Social Influence, Effort Expectancy | | | | | | |

Source: Research data 2018

The output shown in coefficients table below is used to know which independent variables contributed to the prediction of the dependent variable – use of Hospital Management Information Systems and Technology in delivery of healthcare services amongst NGOs in Kenya.

Facilitating conditions makes a strongest unique contribution of .415 and the variable is statistically significant to the equation at **0.000**. Effort expectancy is the second largest contributing uniquely at 0.273. This was also statistically significant at 0.011 as shown in the sig table. Performance expectancy contributed positively at 0.108 and the contribution is not statistically significant .238 as it is greater than 0.05. Furthermore, social influence contributed

0.011 and the contribution was also not statistically significant as it is 0.900 which is greater than 0.05. The results of the analysis are as shown in Table below.

Table 17: Coefficients

| Coefficients^a | | | | | | |
|---------------------------------|-------------------------|-----------------------------|------------|---------------------------|-------|------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.368 | .387 | | 3.539 | .001 |
| | Performance Expectancy | .073 | .061 | .108 | 1.189 | .238 |
| | Effort Expectancy | .230 | .088 | .273 | 2.612 | .011 |
| | Social Influence | -.008 | .062 | -.011 | -.126 | .900 |
| | Facilitating Conditions | .405 | .109 | .415 | 3.728 | .000 |

a. Dependent Variable: Utilisation of ICT in Healthcare service delivery

Source: Researcher, 2018

From the data in the Table above, the study established regression equation was $Y = 1.368 + 0.108X_1 + 0.273X_2 - 0.011X_3 + 0.415X_4 + \epsilon$. Therefore, use of Information System and Technology = $1.368 + 0.108 X$ Performance Expectancy + $0.273 X$ Effort Expectancy – $0.11 x$ Social Influence + $0.415 X$ facilitating Conditions + ϵ .

4.7 Moderating effects of experience on the relationships between independent variables and dependent variable

To explore whether the intervening variable – experience statistically significantly moderated the relationships between independent variables and dependent variable, moderated multiple regression was conducted. The following table shows the results of moderating variable on every relationship.

4.7.1 Effect of experience on the relationship between performance expectancy and use of IS and Technology amongst NGOs in Kenya

The moderating effects of experience on the relationship between performance expectancy and use of HMISs and Technology amongst NGOs is that the change in R-square due to introduction

of experience was 0.173, (0.334 – 0.161). Thus the percentage increase in variation explained by utilization of experience in use of IS and technology is Healthcare service delivery was 17.3%. This change was highly significant as shown in the Sig. F Change of 0.000 ($p < 0.005$). Therefore Hypotheses H₅ was accepted that experience had a significant positive moderating influence on the relationship between performance expectancy and use of IS and Technology amongst NGOs in Kenya. The results are as shown in Table below.

Table 18: Effect of experience on the relationship between performance expectancy and use of HMISs and Technology amongst NGOs in Kenya

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|-------|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .401 ^a | .161 | .152 | .37002 | .161 | 17.272 | 1 | 90 | .000 |
| 2 | .578 ^b | .334 | .319 | .33153 | .173 | 23.107 | 1 | 89 | .000 |

a. Predictors: (Constant), Performance Expectancy

b. Predictors: (Constant), Performance Expectancy, Experience performance Expectancy

4.7.2 Effect of experience on the relationship between effort expectancy and use of IS and Technology amongst NGOs in Kenya.

Table 19: Model summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|-------|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .570 ^a | .325 | .318 | .33182 | .325 | 43.391 | 1 | 90 | .000 |
| 2 | .583 ^b | .340 | .325 | .33006 | .015 | 1.959 | 1 | 89 | .165 |

a. Predictors: (Constant), Effort Expectancy

b. Predictors: (Constant), Effort Expectancy, Experience Effort Expectancy

4.7.3 Effect of experience on the relationship between social influence and use of HMISs and Technology amongst NGOs in Kenya

The moderating effects of experience on the relationship between social influence expectancy and use of IS and Technology amongst NGOs is that the change in R-square due to introduction of experience was 0.266, (0.348 – 0.082). Thus the percentage increase in variation explained by

utilization of experience in use of IS and technology is Healthcare service delivery was 26.6%. This change was statistically significant as shown in the Sig. F Change of 0.000 ($p < 0.005$). Therefore Hypotheses H₇ was accepted that experience had a significant positive moderating influence on the relationship between social influence and use of HMISs and Technology amongst NGOs in Kenya. The results are as shown in Table below.

Effect of experience on the relationship between social influence and use of HMISs and Technology amongst NGOs in Kenya

Table 20: Effect of experience on the relationship between social influence and use of HMISs and Technology amongst NGOs in Kenya

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|-------|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .287 ^a | .082 | .072 | .38698 | .082 | 8.074 | 1 | 90 | .006 |
| 2 | .590 ^b | .348 | .333 | .32812 | .265 | 36.187 | 1 | 89 | .000 |

a. Predictors: (Constant), Social Influence

b. Predictors: (Constant), Social Influence, Experience Social Expectancy

4.7.4 Effect of experience on the relationship between facilitating conditions and use of HMISs and Technology amongst NGOs in Kenya

The moderating effects of experience on the relationship between facilitating conditions and use of IS and Technology amongst NGOs is that the change in R-square due to introduction of experience was 0.063 (0.445 – 0.382). Thus the percentage increase in variation explained by utilization of experience in use of IS and technology is Healthcare service delivery was 6.3%. This change was statistically significant as shown in the Sig. F Change of 0.002 ($p < 0.005$). Therefore Hypotheses H₈ was accepted that experience had a significant positive moderating influence on the relationship between facilitating conditions and use of IS and Technology amongst NGOs in Kenya. The results are as shown in Table below.

Effect of experience on the relationship between facilitating conditions and use of HMISs and Technology amongst NGOs in Kenya.

Table 21: Effect of experience on the relationship between facilitating conditions and use of HMISs and Technology amongst NGOs in Kenya

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|-------|-------------------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .618 ^a | .382 | .376 | .31747 | .382 | 55.719 | 1 | 90 | .000 |
| 2 | .667 ^b | .445 | .432 | .30266 | .063 | 10.021 | 1 | 89 | .002 |

a. Predictors: (Constant), Facilitating Conditions

b. Predictors: (Constant), Facilitating Conditions, Experience Facilitating Conditions”.

Table 22: Hypotheses testing and summary table

| No. | Hypothesis | Accept/Not |
|------------|---|---------------------|
| 1 | Performance expectancy has a positive influence on use of Hospital management Information system and Technology in provision of health-care services at LVCT | Not Rejected |
| 2 | Effort expectancy has a positive influence on use of Hospital management Information system and Technology in provision of health-care services at LVCT | Not Rejected |
| 3 | Social influence has a positive influence on use of Hospital management Information system and Technology in provision of health-care services at LVCT | Reject |
| 4 | Facilitating conditions has a positive influence on use of Hospital management Information system and Technology in provision of health-care services at LVCT | Not Rejected |
| 5. | Experience has a significance moderating effects on the relationship between the performance expectancy and use of Hospital Management Information System and Technology in delivery of Health-care services at LVCT | Not Rejected |
| 6. | Experience has a significance moderating effects on the relationship between the effort expectancy and use of Hospital Management Information System and Technology in delivery of Health-care services at LVCT | Reject |
| 7. | Experience has a significance moderating effects on the relationship between the social influence and use of Hospital Management Information System and Technology in delivery of Health-care services at LVCT | Not Rejected |
| 8. | Experience has a significance moderating effects on the relationship between the facilitating conditions and use of Hospital Management Information System and Technology in delivery of Health-care services at LVCT | Not Rejected |

4.7.5 Optional Model for establishing factors contributing to use of Hospital Management Information System and Technology in Healthcare service delivery amongst NGOs in Kenya

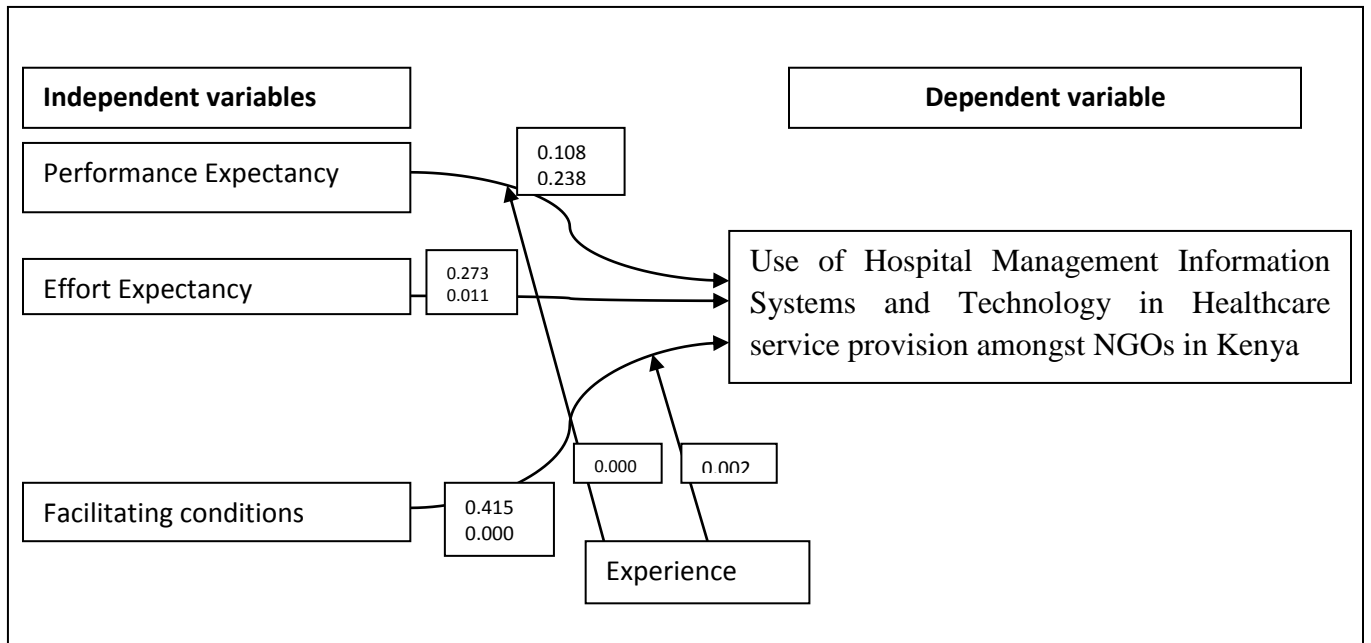


Figure 9: Proposed model for establishing the dictates for HMISs and Technology use in Healthcare service delivery amongst NGOs in Kenya

Conclusion

Performance expectancy, effort expectancy, social influence and facilitating conditions were all independent variables and were found to have strong, positive influence on use of Hospital Management Information System and Technology in Healthcare service delivery amongst NGOs in Kenya except social influence. The intervening variable – experience had moderating influence on the relationships between all independent variables and dependent variable. However, experience was found to have statistically insignificant moderating effect on the relationship between effort expectancy and use of Hospital Management Information System and Technology in Healthcare service delivery amongst NGOs in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the research findings and the implications based on the research objectives. Research conclusions were further drawn from the study followed by recommendations and suggestions for further study.

5.2 Discussion of the Findings

This study investigated the use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya. The specific independent variables that this research focused on were; performance expectancy, effort expectancy, social influence and facilitating conditions. These are the components of the UTAUT model. It also sought to investigate the moderating effect of job experience on the relationships between all independent variables and the dependent variable.

5.2.1 Performance expectancy

The Performance expectancy has a positive and significant relationship with the use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya. The correlation table shows a relationship of .401** and significance of 0.0000 at Correlation is significant at the 0.05 level. This variable looked at the particular aspects as follows (It is useful for me to use of Total Queue, ADT & IQCare in my work, use of Total Queue, ADT & IQCare enables me accomplish tasks quickly as well as use of Total Queue, ADT & IQCare enables me increase my productivity). Furthermore, the standardized Beta Coefficients obtained from regression analysis showed a coefficient of 0.108 and at significance of .238. These particular results indicate that performance expectancy is positively related to the use of HMISs and Technology amongst NGOs in Kenya. Furthermore, this variable contributes to the dependent variable despite of the contribution being insignificant as shown in the Coefficients table 17. Table 18 shows that the introduction of the moderating variable – experience brings a change from .006 to .000. This implies that the moderating variables positively enhances the

relationship performance expectancy and use of Hospital Management Information Systems and Technology amongst NGOs in Kenya.

5.2.2 Effort expectancy

This was the second independent variable. It consisted My interactions with Total Queue, ADT & IQCare is clear and understandable, easy for me to become skillful while using Total Queue, ADT & IQCare, it easy to use Total Queue, ADT & IQCare at LVCT, It is easy to learn and use Total Queue, ADT & IQCare at LVCT. The research findings showed that effort expectancy had a positive and strong correlation of .570** at significance of 0.000 with the use of Hospital Management Information Systems and Technology in Healthcare service delivery amongst NGOs in Kenya. The Standardized Beta Coefficients also showed a value of 0.273 and a significance of 0.011 at ($p < 0.05$). The research findings indicate that the independent variable – effort expectancy is an important factor explaining the use of Hospital Management Information Systems and Technology in Healthcare service delivery amongst NGOs in Kenya. The introduction of moderating variable - experience showed a change of 1.5% increase in explaining the dependent variable. However, the contribution is statistically insignificant as it moves from .000 to .165 which is greater than $p < 0.05$. This therefore can be interpreted to mean that the perceived effortlessness is important in itself in explaining use of electronic systems more than being with or without the experience of Healthcare Hospital Management Information System and Technology.

5.2.3 Social influence

Social influence was the third independent variable that looked at the influence of social setup in explaining the use of systems and Technology in healthcare service provision amongst NGOs in Kenya. This variable sought respondents feedback on particular HMISs user such as peers influence my decision to use Total Queue, ADT & IQCare at LVCT, use of Total Queue, ADT & IQCare at LVCT is influenced by my supervisors and finally my supervisors have been helping me use LVCT Total Queue, ADT & IQCare. The research findings showed that social influence had positive but weak relationship with the dependent variable of correlation coefficient value of .287** and significance of 0.006. This is interpreted to mean that social influence has positive

but weak relationship with the dependent variable and the weak relationship is significant. Furthermore, regression analysis showed a standardized Beta Coefficient of -0.011 and significance of 0.900. The research findings indicates that independent variable – social influence contributes the least and also statistically insignificant to the use of Hospital Management Information Systems and Technology amongst NGOs in Kenya. The findings of both correlation and regression analysis showed weak and insignificant contribution of this variable. Furthermore, the introduction of the moderating variable – experience showed a sig. change from 0.817 to sig. level of 0.000. This is interpreted to mean that in a NGO setup, social aspects determines less the use of electronic systems but whenever it play a role, experience in using these systems would enhance the use of HMISs and Technology in Healthcare service delivery.

5.2.4 Facilitating conditions

This was the fourth independent variable. It consisted of Availability of h/w, s/w and networks has enabled me utilize LVCT Total Queue, ADT & IQCare, knowledge and skills on use of LVCT Total Queue, ADT & IQCare enables me deliver services and finally the presence of ICT assistance on use of LVCT Total Queue, ADT & IQCare. The research findings showed that effort expectancy had a positive and strong correlation coefficient of .618** at significance of 0.000 with the use of Hospital Management Information Systems and Technology in Healthcare service delivery amongst NGOs in Kenya. The Standardized Beta Coefficients also showed a value of 0.415 and a significance of 0.000 at ($p < 0.05$). The research findings indicates that the independent variable – facilitating conditions acts as a major factor in explaining the use of Hospital Management Information System(HMISs) and Technology in Healthcare service delivery amongst NGOs in Kenya. The introduction of moderating variable - experience showed a change of 6.3% increase in explaining the dependent variable. Additionally, the contribution is statistically significant as it moves from .000 to .002 at sig. level of $p < 0.05$. This therefore can be interpreted to mean that the use of HMISs and Technology in Healthcare service provision amongst NGOs is greatly determined by the provision of adequate, appropriate and working h/w, s/w as well as supportive processes. Similarly, the experience that an individual employee has in using such systems (hardware and software) is furthermore helpful in explaining the contribution

of the presence of facilitating conditions on use of HMISs and technology in healthcare service provision amongst NGOs in Kenya.

From the results, it is noted that amongst the four independent variables, presence of facilitating conditions was the most influential and having a significant determination on the use of Hospital Management Information Systems and Technology in Healthcare service delivery amongst NGOs in Kenya. This is then followed by effort expectancy then performance expectancy. Social influence contributed the least to the dependent variable. This means that the respondents acknowledge that the presence of adequate as well as appropriate hardware, software and processes acts as key aspect in an attempt to move towards digital organization.

5.3 Intervening Variables

This study further looked at the moderating effects of experience on use of Hospital Management Information Systems and Technology in Healthcare service delivery amongst NGOs in Kenya. Experience had significant moderating effects on performance expectancy, social influence and facilitating conditions. Experience as a moderating variable was statistically insignificant in moderating the relationship between effort expectancy and use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya.

5.3.1 Experience

This variable had a significant moderating effect on the relationships between three independent variables (performance expectancy, effort expectancy and facilitating conditions) on the use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya. Experience was statistically insignificant in moderating the relationship between social influence and the use of HMISs and Technology.

5.4 Summary of the Findings

The main objective of this study was to examine the influence of UTAUT model variables on the use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya. The study further used experience as an intervening

variable. The dependent variable for this study was use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya. The research findings indicated that up to 45.2% of use of Hospital Management Information Systems and Technology in Healthcare service provision amongst NGOs in Kenya is attributed to the combined effects of all the variables from UTAUT model.

5.5 Recommendation for Practice

The research findings indicated that the UTAUT model variables can be used to provide insight into how NGOs use HMISs and Technology in enhancing healthcare service delivery. Based on the findings, the following recommendations were made to help improve NGOs ability to exploit hospital management information systems and Technology in Healthcare service provision.

NGOs providing health services need to exploit technology to enhance their service provision. This can only be achieved by concentrating on availing relevant hardware and software together with other facilitating conditions. It's also paramount for them to consider performance that is enhanced by availing the right technology. Similarly, effort expectancy that is seen by employees play a critical role in determining the use of HMISs and Technology amongst NGOs.

5.6 Conclusion

In conclusion, this study revealed that the variables borrowed from UTAUT model (performance expectancy, effort expectancy and facilitating conditions) form part of the critical factors contributing to HMISs and Technology use in healthcare service delivery amongst NGOs in Kenya. It is therefore important for such institutions to focus their energies to providing such an enabling environment so as to realize success of a Technological project. Furthermore, social influence do not have a significant contribution to the study. This implies that the social aspects in such studies aren't important and the reason could be because such projects are always donor funded and people employed have clear duties and responsibilities. Furthermore use of hospital management information systems in these organizations are governed by strict policies, thus social influence being less significance.

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Appendix I: Request for authorization to conduct research



**UNIVERSITY OF NAIROBI
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P.O. Box 30197
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Kenya

Our Ref: UON/CBPS/SCI/MSC/ITM/2015

7 May 2018

LUCT Health
P.O. Box 19835-00202
KNH-Nairobi

Dear Sir/Madam

RE: DATA COLLECTION MOSES MNAWE KHAINJA: REG. NO. P54/79218/2015


This is to confirm that the above named is a bona fide student of the University of Nairobi, School of Computing and Informatics.

He is pursuing a MSc. course in Information Technology Management. He would like to collect data for his project entitled: "Information systems Capability on use of Information Communication and Technology in Health Non – governmental organizations in Kenya at LUCT" Under the supervision of Prof. Robert Oboko

Any assistance accorded to him will be highly appreciated.

Yours faithfully

School of Computing & Informatics
University of NAIROBI
P. O. Box 30197
NAIROBI


DR. AGNES N. WAUSI
DIRECTOR
SCHOOL OF COMPUTING & INFORMATICS