

**DIGITALIZATION AND PERFORMANCE OF HIV
COMPREHENSIVE CARE CENTRE SERVICES IN KENYA**

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DECLARATION

This is my original work and has not been presented to any university for examination.

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This research project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This research project is dedicated to my family, who have always believed in me and supporting me throughout my life, as well as throughout the duration of my studies and successful completion of this course.

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ABBREVIATIONS AND ACRONYMS

ADT	Antiretroviral Dispensing tool
ARV	Antiretroviral
BSC	Balanced Score Card
HIV	Human Immune Virus
ICT	Information Communication and Technology
IHOs	International Humanitarian Organizations
IQCARE	International Quality CARE
MIS	Management Information Systems
NASCOP	National AIDS & STI Control Programme
NGOs	Non-Governmental Organizations
PSK	Population Services Kenya
SDG	Sustainable Development Goals
SME	Small and Medium Enterprises
SMS	Short Message Service
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
WHO	World Health Organization

ABSTRACT

HIV comprehensive care center services in Kenya have embraced digitalization in a bid to enhance their performance. Several investigations have been done globally to identify the connection of digitalization and organization performance but the findings have varied because of the different sectors and industries such as academia and healthcare. Thus, the main intention of this research project was analyzing how digitalization affects the performance of HIV comprehensive care centre services in Kenya. The following objectives were used to provide guidance; (i) to determine the extent to which digitalization has been adopted among HIV comprehensive care centre services in Kenya, (ii) to establish how digitalization impacts performance among HIV comprehensive care centre services in Kenya and (iii) to establish limitations facing the implementation of digitalization among HIV comprehensive care centre services in Kenya. The research adopted the system theory of profound knowledge, technology acceptance model and the Process Approach Model. A descriptive survey design was used in this research. The study population was the 100 HIV comprehensive care center services in Kenya within Nakuru County. A sample of 50 was arrived at using Yamane formula. The target respondents were ICT staff, care clinic staff, M&E division manager and project managers. Questionnaires were useful in the collection of primary data, which were sent by email through Google forms. The data was analysed using descriptive (mean, standard deviation) as well as inferential statistics (correlation and regression) analysis. The study showed that digitalization had been done to a large extent by the HIV comprehensive care centres in Kenya. Regression analysis showed a significant positive relationship between digitalization adoption and performance of HIV comprehensive care centres in Kenya. The regression analysis also showed that collective adoption of digitalization accounted for 62.5 percent of the changes in performance of these centres. The respondents disagreed with the challenges presented as being faced in digitalization adoption by HIV comprehensive care center services in Kenya. According to the findings of this survey, digitalization is critical for firms looking to enhance their performance. Managers as well as board members of HIV comprehensive care centres that have yet to implement digitalization are advised to do so to enhance their performance. While respondents disagreed with presented challenges being faced in digitalization, it is still proposed that HIV comprehensive care centres management develop sound policies to assist them in further overcoming the problems of digitalization deployment.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Business processes are continuously being digitalized to improve efficiency and enhance quality of services or products offered to end-users. Digitalization has been widely recognized as a mechanism on which firms compete to improve market performance. Advancements in Information Communication Technology (ICT) have increased globalization which has subsequently intensified competition in business. The improvements in organizational efficiency and effectiveness can be attributed to digitalization in implementation of optimal business strategies. Improvement in organizational performance can therefore be achieved through digitalization to assist in business processes (Abugabah et al, 2009).

Public, private and Non-Governmental (NGOs) health institutions have recently gone digital in an attempt to provide more efficient and effective healthcare services. It is perceived that digitalization aligns processes such as data collection, analysis, evaluation and its effective utilization to support strategic and timely making of decisions (Kimaro & Nhampossa, 2007). If these attempts are a success, social empowerment which is a Vision 2030 pillar will be achieved. HIV comprehensive center care services in Kenya currently provide healthcare services in HIV management, with the goal of lowering HIV infections to zero. Most of these facilities have digitized their operations and therefore need to investigate whether the digitalization has had an influence on their performance.

The study is based on system theory of profound knowledge by Deming (2000) which advances that constant improvement of processes, growth in knowledge management and understanding of variations will eventually lead to improved performance in

organizations. The second is the Technology Acceptance Model (TAM) by Davis (1989) which is a remodeled version of the theory of reasoned action (TRA) which specifically asserts how and why users accept and adapt information systems and the third theory is the Process Approach Model by Cameron (1986) which is involves the transformation of business resources to produce goods and services.

1.1.1 Digitalization

Digitalization is a popular expression used to imply the digital transformation of societies and the economy as a whole. It defines the transformation for an industrial era dominated by analogue technologies to a new era of information and innovations dominated by digital business innovation and digital technologies (Christensson, 2010). Digitalization involves using computers to obtain, manipulate, analyze, store and send data and information. It can be effectively be used by managers in optimizing firm operations as well as handling change (Englander, 2009). Beckinsale and Ram (2006) assert that any application of scientific knowledge to capture, store, transmit and use data is digitalization. Daft, Lengel and Trevino (1987) define digitalization as use of telecommunications, software, hardware, software, database management and other ICT technology used for data storage, processing and distribution.

As an important aspect, digitalization aids in creativity and innovation, without which an organization will be lagging behind other organizations. Digitalization helps organizations to increase the ease of training new staff, aid in the process of developing marketing strategies, and develop processes for analysis and comparisons within an organization. In addition, digitalization leads to enhancement of productivity, improvement in profitability, enhanced work relations and collaboration, competitive

gain and efficient utilization of resources at all organizational levels (Melville, Kraemer & Gurbaxani, 2004).

Organizations embrace digitalization in their operations to bring about efficiency and what differentiates organizations is the infusion of innovation and creativity in one organization compared to others. Organizations that experience improvement in their operations attribute a great deal of this improvement to digitalization (Ross, Hogaboam & Hannay, 2017). Digitalization has been acknowledged as an important component that enables improved organizational performance in various organizations (Bharati & Berg, 2013). Digitalization improves communication, reduces wastage and ensures proper utilization of resources in an organization (Barton, 2019). Digitalization therefore provides an organization with the required infrastructure which helps an organization gain competitive advantage. Digitalization is usually operationalized as the extent of digitalization in human resource processes, financial management processes, procurement processes, quality assurance processes among other organizational functions (Christensson, 2010).

1.1.2 Organization Performance

Noyé (2002) describes performance as entailing attainment of goals that an organization sets out to achieve. Rolstadas (1998) believes that organizational performance is a complex concept with the following seven criteria: efficiency, reliability, productivity, effectiveness, quality of work, creativity and profitability. Performance is therefore closely linked to the achievement of the above-mentioned criteria, which can be considered as performance goals. Even though there is no commonly settled upon

meaning of performance, an organization ought to have objectives and measure all outcomes based on the set objectives.

To measure performance, organizations use various methods one of which is the Balanced Scorecard (BSC). BSC measures four aspects of an organization which are; consumer viewpoint, internal business perspective, economic perspective and perspective on technology and training (Kaplan & Norton, 2001). Conversely, ICT helps organizations have coordinated and effective ways of communication. Therefore, ICT is adopted to interconnect the organization's systems and processes while BSC is a way in which the efficiency and effectiveness are measured.

For HIV comprehensive care centers, patients are the beneficiaries of its interventions and therefore the care centers need to know how they are meeting the beneficiaries' needs. Performance in this case is measured by outcomes which are the results of the comprehensive centers' programs and/or project and efficiency with which the centers use available resources to achieve planned results (Sharma, 2012). Internally HIV comprehensive care centers need to know what they must excel at in order to achieve the reason for their existence and then look at ways of innovating and improving so as to experience improved performance. In addition, providers of funds need to get value for their money through proper utilization and control of the available resources. A HIV comprehensive care center performance in this regard is measured by how efficiently it achieves the goals it has set (Sharma, 2012). Some of the measures of performance in HIV comprehensive care centers include timeliness, cost reduction, quality of services and flexibility.

1.1.3 Digitalization and Firm Performance

A number of empirical studies have noted that digitalization has a positive impact on firm performance (Ashrafi & Murtaza, 2008; Chiware & Dick, 2008; Oliveira & Martins, 2011). In contrast, other studies have shown very little or no effect of digitalization on business performance (Brynjolfsson, 1995; Carr, 2003).

According to Anandaraja, Igbara and Anakwe (2002), digitalization in underdeveloped nations have been underutilized and as such, it does not make any significant impact in improving organizational performance among those using it. This statement attests to the fact that proper use of digitalization can lead to improved performances, utilization can bridge between digitalization adoption and performance. As noted by Subramani (2004) in a study which investigated supply chain relationships, organizational relationships that are specific to investments plays an important mediating function between patterns of digitalization appropriations operational and strategic performances.

There is general argument supporting information, communication and technologies as important tools used to manage inter-organization relationships, mainly among supply chain members across countries (Wangs et al., 2006). For instance, Dell Computers company employed successfully digitalization in it business worldwide through virtually integrated value chain with customers, distributors, and suppliers. Organizations are increasing their attention on information communication and technology in developing business solutions, improves organizational effectiveness and efficiency of decision-making processes, improve productivity and service delivery to realize dynamic stability and be able to compete for the new markets (Molloy & Schwebks, 2015).

1.1.4 Challenges Faced in Adoption of Digitalization

Although there has been increased attention of adoption of digitalization in many sectors, several companies are not properly equipped to adequately support and nurture effective exploitation of information, communication and technology, which would lead to greater development. According to Khan, Al-Shihi, Al-Khanjari, and Sarrab, (2015) these organization lack knowledge, expertise or organizational capacity needed to implement digitalization. Moreover, use of digitalization is often viewed as a thorny, problematic issue associated with back office systems. Information, Communication and technology in most instances have questionable reputation especially with regard to its previous unsuccessful or expensive initiatives.

Literature has shown that in the present business environment, many organizational structures, employees and the ways in which operation have been considered as an important element and which is not easy to prevent or redirect (Mingaine, 2013). As such, it has become very easy to utilize digitalization tools in sustaining and improving firm constructs and strategies that make very great and important progress. Moreover, it is extremely challenging to start new ways of working with the organization that are not often similar and requires a shift in the strategy, competencies and skills.

Additionally, there has been a major problem of inadequate planning and financing adoption of digitalization in some organizations. Whereas there are increased pressures to raise money to invest in digitalization, there arises sometimes a problem to the organizations in planning proper and the financial resources as well as the human investments with regard to digitalization as an important business activity used to develop organization's program. The emerging possibilities of new technologies presents

potential and far-reaching concerns that tend to challenge or can even undermine the assumption which the organization depends on to exist. As the organization reflects on why companies are initially started, they tend to differentiate a number of certain gaps between the people and organizations in low-income areas (Ross, Hogaboam & Hannay, 2017).

1.1.5 HIV Comprehensive Care Centre Services in Kenya

HIV comprehensive care centers refer to both public and private institutions that provide HIV linked services to patients. There are currently over 1000 comprehensive care service centers in Kenya distributed across the 47 counties. A significant number of these facilities have fully digitalized their systems to facilitate service provision to their stakeholders. The expectation is that successful digitalization among these centers will eventually lead to social empowerment realization which is a key pillar of Kenya's vision 2030.

The strengthening of health institutions remains a key objective as outlined in SDG 2015, WHO 2010 and Kenya's vision 2030. A key objective of vision 2030 in Kenya is the realization of a country's competitiveness and increased prospects. Social empowerment remains a strategic pillar. It involves provision of accessible and cost-effective healthcare to a country's nationals. The availing and use of digital systems is one measure of improving healthcare access (Kihuba et al. 2014). HIV comprehensive care service centers are constantly looking for the opportunities that are made available as a result of the successful implementation of digital systems in healthcare service provision (Kimaro & Nhampossa, 2007).

The implementation and use of digital systems in the health systems and specifically in the HIV comprehensive care service centers facilitate efficiency in health care provision and health data exchange among stakeholders (Kuperman, 2018). Without digitalization, the HIV comprehensive care service centers have faced challenges such as increased operational costs, are poor quality of services, operational delays, administration headaches and escalating overheads. Digitalization is expected to address most of these challenges. In order for HIV comprehensive care service centers to be successful, they need to be flexible and conform to their customer needs (Ambe & Badenhorst-Weiss, 2011).

1.2 Research Problem

Goodman, Gorman and Herrick (2010) noted that digitalization in healthcare systems of developing nations aims to improve its quality, efficiency and convenience in their facilities. Many studies have been done globally to identify the connection between digitalization and organizational performance. Abugabah et al., (2009), conducted a detailed analysis of the impact that information systems have on organizational performance. Their conclusion was that to identify the role it plays in performance of organizations, a measure of its utilization as opposed to its investment must be made. Madadipouya (2015), evaluated the strategic utilization of IT applications in the achievement and maintenance of a competitive advantage, concluded that IT is a factor that contributes to success if utilized strategically and timely. The researcher noted that IT should be integrated with the adopted strategies and factors like reliability, performance and business environmental alignment should be put into consideration. In a similar study by Hackler & Saxton (2007), the researchers examined how non-profit

firms strategically utilize IT in improving capacity and unearthed potential. The researchers noted that to strategically utilize IT, non-profit organizations must gain support to understand their capacity to utilize IT. These studies were however conducted in different contexts and thus results cannot be applied to the current context.

HIV comprehensive care center services in Kenya have embraced digitalization in a bid to enhance their performance. The digitalization technologies adopted include ADT systems that are utilized in dispensing drugs and managing drug logistics; IQCARE- (International Quality Care)-the system facilitates the management of patients and bulk integrated mobile SMS System that sends SMS reminders to patients of their appointments. Some of the challenges facing the firms and need to be overcome include increasing overhead costs, delayed delivery of services, administration headaches and stock outs. There was need to determine how this digitalization impacts performance and the challenges faced in the digitalization process as not all of these service care centres have fully digitalized their operations.

Several studies have been conducted locally on digitalization and its values, Mobegi (2012) did an analysis of ICT adoption and performance, of business projects in rural areas (case of Kibwezi district in Makueni County). The findings showed that adopting ICT plays a role in allocating of resources since it is automated. Gataua (2013) did a research on determinants of ICT adoption by SME's in Thika municipality. The results showed that communication is a crucial factor influencing ICT adoption by SMEs. A study by Ndeda (2014) on logistics Information Systems (IS) and performance of International Humanitarian Organizations (IHOs) in Kenya concluded that the use of IS enhanced cost effectiveness, on-time delivery, accurate and timely reporting of IHOs.

Although these studies were conducted locally, they conceptualized the variables differently. Further, they were conducted in different contexts, thus their findings are not applicable in this context.

Various studies and researchers have applauded the HIV comprehensive care center services in Kenya, but a few have studied the influence that digitalization has on performance of these centers. It was assumed that digitalization has enabled the development and the implementation of the HIV comprehensive care centers in Kenya. There has been no study on the digitalization and performance of HIV comprehensive care centers in Kenya. Therefore, the identification, analysis and applauding of the role played by digitalization in these centers, must be based on an investigation. In respect of this, the question arises; how does digitalization affect the performance of HIV comprehensive care center services in Kenya?

1.3 Research Objectives

The objective was examining the relation between digitalization and performance of HIV comprehensive care center services in Kenya.

The specific objectives were:

- i. To establish the extent of adoption of digitalization practices by HIV comprehensive care center services in Kenya
- ii. To determine how digitalization impacts the performance of HIV comprehensive care center services in Kenya
- iii. To establish the challenges being faced in adoption of digitalization by HIV comprehensive care center services in Kenya.

1.4 Value of the Study

This investigation will significantly contribute to theories on digitalization and performance of firms. The study may contribute to future references for future academicians. The study may identify further areas of research by highlighting related topics resulting in identification of research gaps. The study contributes significantly to digitalization and organizational performance.

Policy makers will be enlightened by its findings by showing them how digitalization influences performance of HIV comprehensive care center services in Kenya and therefore identify the tools to be used by the regulators to boost the efficiency of other similar institutions that are a part of realizing the Vision 2030. More so the study will be aimed on assisting those firms that have not adopted digitalization at the moment. The management of these organizations will have the ability to identify digitalization practices which are appropriate to them so as to improve performance.

Findings will be a basis for effective implementation of digitalization practice. The study will help practitioners in formulation and implementation of policies for improved performance.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter literature review pertinent to the study is reviewed so as to address the research problem. The reason for the review is identifying the gap and increase the knowledge on ways that digitalization will facilitate achievement of better performance at HIV comprehensive care center services in Kenya.

2.2 Theoretical Literature Review

The section outlines theories that are pertinent to the relation between digitalization and performance are reviewed. Three theories forming the theoretical basis of this study are discussed in this section and they are namely; system theory of profound knowledge, the technology acceptance model and the process approach model.

2.2.1 System Theory of Profound Knowledge

The system theory of profound knowledge by Deming (2000) provides a framework for thought processing and auctioning for any leader who has a goal of creating a thriving organization. In this study, it was used to evaluate the relationship between the adoption of digitalization practices and organizational performance. Constant seeking of new knowledge in an organization for continuous improvement, studying and understanding human behavior to gain knowledge for motivating, coordinating and managing people aimed at optimizing a system. Only then can an organization experience the benefits of digitalization. When management of an organization appropriately applies the principles and practices of this theory, an organization can reduce organizational costs through elimination or reduction of waste, rework, staff turnover, and litigation while at the same

time improving quality, maintaining customer loyalty, maintaining a satisfied workforce with a view of attaining improved performance which ultimately leads to profitability (Deming, 2000).

The theory proposes that a leader must understand a system they are managing in order to gain insight on how to improve it for the purpose of improved organizational performance. To optimize a system, there must be coordination and cooperation among system parts which is brought about by proper leadership. Digitalization plays an important role in ensuring coherence in system functionality. This theory was therefore important in this study and helped find out how management in various HIV comprehensive care center services in Kenya have implemented digitalization and how it plays a role in HIV comprehensive care center services in Kenya to improve performance.

2.2.2 Technology Acceptance Model

The model by Davis (1989) attempts to clarify how clients embrace and use a new concept or innovation. This model states that when a client is presented with an alternative innovation, certain factors that affect their decisions on the means and utilization time. This encompasses the perceived usefulness and convenience of the alternative innovation. TAM accepts the existing chain of actual conduct beliefs, intent and temperament. This was developed by social clinicians on the basis of the concept of the operation envisaged. Davis study recognizes two important components that's is perceived usefulness and perceived convenience (Davis, Pallister & Foxall, 2002).

To a large extent this theory has influenced research on how technology is accepted. This

study will apply TAM a part of three different aspects, primarily to establish how use of technology improves hierarchical administration conveyance to natives, how preparation of technology staff affects the use of technology in HIV comprehensive care centres and how the access to technology affects the utilization of technological innovation among HIV comprehensive care centres. This theory informs this study with regards to the benefits that emanate from the use of digitalization that is the perceived usefulness as well as the challenges experienced in the adoption of digitalization among the HIV comprehensive care centres in Kenya that is the perceived ease of use.

2.2.3 Process Approach Model

The process approach model focuses on how resources are converted to create goods or services in an organization (Thomas, Schermerhorn & Dienhart, 2004). This deals with the efficiency and effectiveness of an organization's internal systems and processes to optimize organizational performance. This looks at improved performance in an organization occasioned by relationships among all the staff which is built on honesty, trust and good will leading to seamless stream of information on both vertical and horizontal basis (Cameron, 1986). The model is relevant in the study since it looks at how processes in the organization are interlinked to bring about improved performance in organizations.

There are various tools that are used in organizations to operationalize performance one of which is balanced scorecard. Balance scorecard aims to measure how components of business strategy have been achieved (Kaplan & Norton, 2001). The performance areas assessed primarily by balance scorecard are financial, customers, internal business processes and innovation including learning and growth. The use of balance scorecard

helps an organization to measure the most important aspects of its operations to find out if it is performing as per set goals or not.

2.3 Digitalization

Digitalization combines the use of computer technology (computer software and hardware) and telecommunication technologies like image, voicing and data (Laudon & Laudon, 2004). The role of such technologies is to aid in the collection, gathering, storage, and provision of the necessary output that support organizations (Olise, Anigbogu, Edoko & Okoli, 2014). Additionally, digitalization can involve the utilization of computer applications like customer relationship management, inventory management systems, accounting systems, payroll and HRM systems and business analytics systems in the management of business processes (Apulu, 2012).

The adoption and use of digital systems in developing nations like Kenya is low in comparison to developed nations like UK, US, China, Germany, France and Russia (Apulu & Latham, 2011). Many large firms have made heavy investments in digitalization in business management (Parker & Castleman, 2007). Contrarily, few small enterprises have adopted digitalization as a key business driver when operating (Akomea-Bonsu & Sampong, 2012). Several barriers still exist in the adoption of digitalization by small businesses (Harindranath, Bernes & Dyerson, 2008).

Digitalization stores key information about customers, suppliers and internal users such as employees (Drucker, 2016). Human resource processes, financial management processes, procurement processes, quality assurance processes are some of the processes that have been digitalized in organizations and this has led to increased efficiency

(Markides, 2015). Nickols (2014) posits that having a human resource, customer relationship management systems, and other systems such as digital financial management systems and procurement processes implies a high extent of digitalization.

2.4 Firm Performance

The performance of a firm is a central focus to both business and economist across countries. Nonetheless it is one of the complex and multidimensional phenomena. As such firm performance is characterized through the firm's ability to create results and actions that are acceptable to all stakeholders. For many organizations, to achieve high performance, it depends on the success in the deployment of the available assets and the natural resources as well as effective knowledge management (Lee and Sukoco, 2007). Schemerhorn et al., (2002) posits that performances can be described in terms of quantity and quality of people or groups that are achieved in the organization. For Koh, Demirbag, Bayraktar, Tatoglu, and Zaim (2007) performance can be measured through both financials and market criterion. According to researchers such as Chos and Dansereu (2010), organizational performance is performance of an organization when compared with its objectives and mission.

Wangu (2015) identified type of leadership, internal organization structure and pressure from stakeholders as determinants of firm performance. Other factors identified include established communication channels in the organization, level of accountability of the management to varied stakeholders within the organization, the legal framework in the country and ease at which change is accepted and implemented in the organization. Sharma (2012) identified measures of performance in not for profit organizations to include timeliness, cost reduction, quality of services and flexibility.

2.5 Digitalization and Firm Performance

The acquisition and utilization of digital systems has been on the increase worldwide in the last decade (UNCTAD, 2015). Increased ICT adoption is the result of increased competition, low software and hardware costs, advanced ICT infrastructure, simple systems, trained users and a shift in organizational culture (Apulu, 2012; Ashrafi & Murtaza, 2008).

Falk and Biagi (2015) used globally comparable data for 14 countries in Europe to research the effect of various ICT technologies and e-commerce activities on jobs and productivity. Data was obtained from ESSLait Micro Moments Database containing connected and micro-aggregated information about corporations from national statistical offices. Differences in types of ICT capacities were found to be significantly linked to labor productivity. There is also variation between the effect on productivity of ICT and the ICT type. It was also found that effect of ICT varies considerably between manufacturing and service industries. The findings agree with existing knowledge in that there is a difference between ICT use in either manufacturing or service industries. The study did not use primary data and therefore did not consider the assumptions that gave rise to the secondary data.

Jela (2013) conducted a study on adoption of technology in supply chains for large manufacturing firms in Nairobi. The study was to find out; the determinants of technology adoption in a company's supply chain, determine the level of adoption of supply chain and determine the degree that technology adoption in the firm supply chain affects its performance. A total of 64 firms were randomly selected for interviews using questionnaires. Descriptive statistics and linear regression were the methods used for data

analysis. Outcomes demonstrated that; technology use in supply chain enhances the effectiveness and efficiency of operations. Similarly having supply chains that have embrace technology serves a competitive advantage over other organization.

Odhiambo (2013) examined ICT use in high schools in the district of Rachuonyo South, Homa-Bay, Kenya. 320 students, 24 teachers and 8 heads of high school were sampled in the research, and a questionnaire administered to them. The study revealed that ICT was an incredibly powerful tool in teaching and learning process. Students who are constantly exposed to ICT skills changed their views on both education and ICT and ICT strengthened teachers ' efficiency and effectiveness in their work. The findings support existing knowledge on how ICT leads to efficiency and effectiveness in service delivery.

Gules et al. (2012) studied the impact supply chains and information technologies might have on business performance in Turkey. Case study approach is used to analyze this objective. More specifically the study was conducted on industries producing Fast Moving Consumer Goods. The authors modeled supply, production and distribution activities to be short, medium and long-term operations. Results showed that including information technologies in supply chains has a linear / direct effect on business performance at different criterions.

Magutu (2012) did an examination of strategies adopted in supply chains, performance and technology of Kenyan Manufacturing firms. The main objectives were establishing how supply chain performance related to supply chain strategies and establish the degree that technology adopted in supply chain impacts performance of large manufacturing firms. Cross sectional data was collected from a total of 63 large scale manufacturing firms in Kenya. Qualitative approaches such as, descriptive statistics and other statistical

tests namely, correlation analysis and cause and effect methods like regression analysis provided basis on which to reject or not to reject the null hypothesis. Findings show that; approximately half of the supply chain performance was explained by supply chain strategies. Similarly, if supply chain strategies and supply chain technology are combined they justify up to 90% of performance of a firm.

In view of the above, there exists few studies on the influence of digitalization on the performance of HIV comprehensive care centers in Kenya. It is assumed that digitalization has enabled the development and implementation of the HIV comprehensive care centers in Kenya but lack of empirical studies implies that a study is needed to test this hypothesized relationship.

2.6 Challenges Facing Digitalization

Typically, implementation of digitalization is expected to assist in better management of resources, decrease workload, improve efficiency and boost work productivity. Considering the prevailing inefficiencies and conditions in developing countries these promises are exaggerated. International organization such as the World Health Organization and World Bank perform a significant part in influencing these promises since developing nations rely on them for both financial and technical aspects (Kuperman, 2018).

Esuh, Ossai and Adegoke (2014) looking at the technical angle of digitalization implementation found out that inability to transform and reconfigure business process to work well within the digitalization system was top at the technical challenges faced by organizations in digitalization implementation. Following closely were lack of requirements for information system and difficulties in upgrading the previous systems to

new versions and having staff adapt accordingly. Aaltonen and Ikävalko (2002) adds to the list of other challenges facing digitalization implementation as follows: difficulties in aligning the digitalization strategy and an organization's business strategy, adopting digitalization strategy behind schedule, inability to measure benefits from digitalization, expenses to be incurred in changing from one system to another, inadequate budgetary allocation for equipment and applications to be used in digitalization adoption. It is quite clear that adoption of digitalization has a myriad of challenges in any organization yet its importance to any business cannot be over emphasized.

Aaltonen and Ikävalko (2002) expounds the management challenge to include, little or no support from top management for digitalization, weak management roles in digitalization, lack or inadequate support from top management in creation and implementing systems and poor coordination and communication to ensure responsibilities are well articulated. Wilson (1989) in his study of 500 companies in the United Kingdom (UK) found that not employing professional staff, inadequate resources for user training, the rapidly changing needs of the digital system users and inability by systems to fulfill the user's expectations as the main human challenges faced in implementation of digitalization.

2.7 Conceptual Framework

This is an illustration that outlines key concepts and variables and the linkages between them. This study seeks to determine how Digitalization has impacted performance.

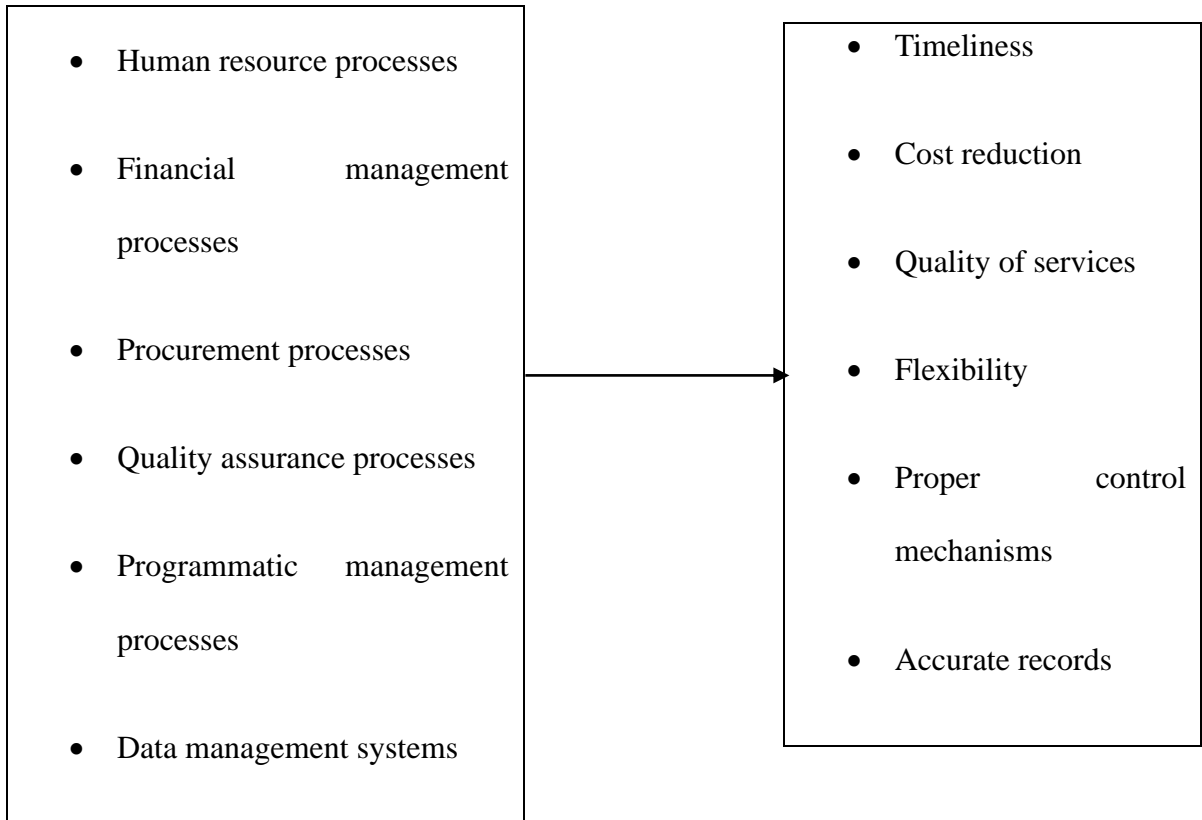
Figure 2.1: The Conceptual Framework

Independent Variables

Digitalization

Dependent Variables

Firm performance



Source: Researcher (2020)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

To ascertain the effect of digitalization on performance of HIV comprehensive care center services in Kenya, a research methodology that lays out the manner in which the investigation would be carried was necessary. Four sections were incorporated in this chapter that comprise of the research design, data collection, population of the study and lastly the technique needed for analysis.

3.2 Research Design

Descriptive research design was used for the study. The aim of a descriptive study is establishing the “what and how” of a condition. The suitability of this design was that it permitted the researcher to use quantitative data to ascertain effect of digitalization on performance of HIV comprehensive care service centers in Kenya. Causal research design was also used to show the relation between digitalization and firm performance. The researcher chooses causal design as it helped to infer on the relationship between digitalization and performance.

3.3 Population of the Study

This research study population comprised of the 100 HIV comprehensive care center services in Kenya within Nakuru County.

3.4 Sample Design and Sample Size

The sample size is 50. This was arrived at using the Yamane (1967) formula. For the purpose of selecting the specific organizations, Judgmental sampling was used. The study

adopted Yamane (1967) formula with assumption of 90% of confidence level to estimate the sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = sample size; N =size of population; e = precision level; 1 = Constant

$$n = 100/ 1+ 100(0.1)^2 = 50 \text{ respondents}$$

3.5 Data Collection

Primary data for the study was obtained using structured questionnaire. The target respondents were ICT staff, care clinic staff, M&E division manager and project managers. The research instrument was structured into four sections needing responses to different dimensions according to the Likert scale for ease of rating / response ranking and data analysis. The beginning had section A, which consisted of a brief background concerning the biographic data of the respondents. The second section, B, focused on the extent of digitalization among HIV comprehensive care centers in Kenya. The third section, C, focused on performance of HIV comprehensive care centers in Kenya. The fourth section, D focused on challenges facing digitalization among the firms. Google forms were adopted in the administration of the questionnaire.

3.6 Data Analysis

The primary data collected by the questionnaire was checked, edited and coded. For background information, objective i and iii, descriptive statistics were conducted while objective II was achieved by conducting regression analysis. Multiple linear regression model was applied in analyzing quantitative data because there was one dependent variable and several independent variables. This enabled establishing if there exist and

association of the dependent variable with either one or more of the independent variables.

The regression model below was used:

$$Y = \beta_0 + \beta_1 \text{HRP} + \beta_2 \text{FMP} + \beta_3 \text{PP} + \beta_4 \text{QAP} + \beta_5 \text{PMP} + \beta_6 \text{DMS} + \varepsilon$$

Where: Y = Firm performance

β_0 = regression intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = Regression coefficients

HRP = Human Resource Processes, FMP = Financial Management Processes, PP = Procurement Processes, QAP = Quality Assurance Processes, PMP = Programmatic Management Processes, DMS = Data Management Systems, ε = error term

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF RESEARCH FINDINGS

4.1 Introduction

The study's findings are presented in this section. The general information section, which includes the response rate and demographic data, is one of the sections in this chapter. The descriptive as well as inference statistics are also discussed in line with the study objectives.

4.2 Response Rate

The responses received divided by the number of target participants are the rate of response in survey research. The completion rate is the response rate, that is denoted in form of a percentage. Table 4.1 contains the response rate for the investigation.

Table 4.1: Response Rate

Response Rate	Frequency	Percent
Returned	50	100
Unreturned	0	0
Total	50	100

Primary Data (2021)

As part of the study, 50 questionnaires were given to sampled staff. There were 50 questionnaires in total that were completed and returned. This resulted in 100 percent response rate. This was presented in Table 4.1.

4.3 General Information

This segment presents the findings on the descriptive statistics for the demographic outlines of all the participants and the firm's background information.

4.3.1 Gender

Gender specification was a requirement to the target population. Outcomes demonstrate that male participants' percentage was 54% whereas females were 46%. The fact that there is no substantial variance in the number of male as well as female employees among the target participants can imply that the HIV comprehensive care centres value gender diversity. Table 4.2 summarizes the findings.

Table 4.2: Gender

Gender	Frequency	Percentage
Male	27	54%
Female	23	46%
Total	50	100%

Primary Data (2021)

4.3.2 Age

The investigator too had interest in establishing the respondent's age. Table 4.3 gives an illustration of the results. Results illustrate that the most participants (52%) were between 50-45 years old, 46% aged between 25-35 years while 2% were aged between 46 and 55 years. None were aged between 18 and 24 years or above 55 years. The outcomes suggest that of HIV comprehensive care centres workers are relatively young.

Table 4.3: Age of the Respondents

Age	Frequency	Percentage
18-24	0	0%
25-35	23	46%
50-45	26	52%
46-55	1	2%
Above 55	0	0%
Total	50	100%

Primary Data (2021)

4.3.3 Highest Level of Education

The responders were requested to state their education level. The outcomes are summarized in Table 4.4. The majority (62 percent) had a diploma as their highest level of education, 12% had an undergraduate qualification while 26 percent were graduates. This shows that HIV comprehensive care centres are eager to hire employees that are highly educated. In most cases, a high level of education is linked to competency and mastery of the skills required to accomplish one's work duties.

Table 4.4: Highest Level of Education

Education	Frequency	Percentage
Diploma	31	62%
Undergraduate	6	12%
Graduate	13	26%
Total	50	100%

Primary Data (2021)

4.3.4 Years with the Firm

Respondents had worked for their current organization for a variety of years. The amount of time spent with a firm can be used to determine how well they know internal processes, capabilities, or effectiveness. The results indicated that 42% had stayed in their current rank for 5-7 years, 30% for 8-10 years, 18% for 2-4 years, 6% for 0-1 year and 4% for above 10 years.

Table 4.5: Years with the Firm

Years	Frequency	Percentage
0-1 year	3	6%
2-4 years	9	18%
5-7 years	21	42%
8-10 years	15	30%
Above 10 years	2	4%
Total	50	100%

4.3.5 Age of the Firm

The study established the age of the comprehensive care centres. The results in Table 4.6 reveal that 40% of the centres were between 11 and 15 years, 28% were aged between 5 and 10 years, 18% were between 16 and 20 years, 10% were aged above 20 years while 4% were below the age of 5 years. This means that the centres were in operation long enough to provide the required information on digitalization and performance.

Table 4.6: Age of the Firm

Firm age	Frequency	Percentage
Below 5	2	4
5-10	14	28
11-15	20	40
16-20	9	18
Above 20	5	10
Total	50	100

Primary Data (2021)

4.3.6 Sponsorship of the Organization

The research also sought to establish the sponsors of the various HIV comprehensive care centres. Table 4.7 outcomes revealed that 90% of the centres operated as NGOs while 6% were missionaries. Only 4% of the centres were sponsored by the government. This means that majority of the HIV comprehensive care centres are owned by NGOs. This is significant in the study as it helps in acquiring views from different perspectives. Table 4.7 summarizes the findings.

Table 4.7: Firm Ownership

Sponsorship	Frequency	Percentage
Missionary	3	6
NGO	45	90
Government	2	4
Total	50	100

Primary Data (2021)

4.3.7 Number of Employees in The Firm

The results in Table 4.8 below showed that 46% of the firms had 36 – 50 employees, 46% of the firms had 21 – 35 employees, 8% of the firms had 11 – 20 employees while none of the firms had less than 11 employees. This implies that most HIV comprehensive care centres are relatively large.

Table 4.8: Number of Employees in the Firm

Number of employees	Frequency	Percentage
Less than 5	0	0
5 – 10 employees	0	0
11 – 20 employees	4	8
21 – 35 employees	23	46
36 – 50 employees	23	46
	50	100

Primary Data (2021)

4.4 Descriptive Statistics

The descriptive conclusions for every variable under investigation are reported in percentages, means, as well as standard deviations in this part.

4.4.1 Digitalization Adoption

Table 4.9 shows the mean and the standard deviation for the specific features of digitalization adoption.

Table 4.9: Descriptive Statistics for Digitalization Adoption

Statement	N	Mean	Std. Dev
All human resources (HR) processes in the organization are computerized	50	3.45	1.13
All financial management processes in the organization are computerized	50	3.53	1.09
All procurement processes in our organization are computerized	50	3.36	1.12
All programmatic management processes in the organization are computerized.	50	3.51	1.03
All quality assurance practices in the organization are computerized.	50	3.31	1.15
All staff are trained on basic use of computer system in our organization	50	3.71	1.17
There is always steady internet in the organization	50	3.31	1.29
All staff use the system in their work	50	3.39	1.26
There are data management systems in the organization.	50	4.16	1.14
Average	50	3.53	0.80

Primary Data (2021)

The findings revealed that most of the respondents concurred that the most adopted digitalization aspect is data management system (Mean=4.16, std. dev=1.14). The findings further revealed that there was agreement by the respondents that the comprehensive care centres staff are trained on basic use of computer system (Mean=3.71, std. dev=1.17). The findings also revealed that the comprehensive care centres have their financial management processes computerized (Mean=3.53, std. dev=1.09). Additionally, findings discovered that majority of the respondents agreed that comprehensive care centres have a programmatic management processes in the

organization are computerized (Mean= 3.51, std. dev=1.03). The descriptive results also revealed that the comprehensive care centres HR processes are computerized (Mean=3.45, std. dev=1.13). The findings, furthermore, showed that most respondents agreed on the statement that comprehensive care centres staff use the system in their work (Mean=3.39, std. dev=1.14) and that the comprehensive care centres have procurement processes computerized (Mean=3.36, std. dev=1.12). Lastly, the findings revealed that most respondents concurred that quality assurance practices in the organization are computerized (Mean=3.31, std dev=1.15) and that there is steady internet in the organization (Mean=3.31, std dev=1.29). On average, the results revealed that comprehensive care centres have adopted digitalization to a large extent as shown by an average mean of 3.53 and a standard deviation of 0.80.

4.4.2 Firm Performance

The specific attributes mean as well as standard deviation of HIV comprehensive care centre services' performance are as outlined in Table 4.10. From the findings, most respondents concurred that their organization maintains proper records (Mean=4.09, std. dev=1.07). The findings also discovered that expenditure in the organization is incurred as per the work plans (Mean=3.95, std. dev=0.96). The findings also show that most of the respondents agreed that all services are offered within the set timelines (Mean=3.91, std. dev=0.83). Additionally, findings revealed that most of the respondents agreed that their organization has proper control mechanisms over all payment processes (Mean=3.89, std. dev=1.08).

Table 4.10: Descriptive Statistics for Firm Performance

Statement	N	Mean	Std. Dev.
All our services are offered within the set timelines	50	3.91	0.83
The cost of running our services has been reducing with time	50	3.50	1.09
The quality of our services has been increasing over time	50	3.82	1.19
Expenditure in the organization is incurred as per the work plans	50	3.95	0.96
The organization has flexibility to adjust budgets to meet changes in programming.	50	3.79	0.88
The organization maintains proper records	50	4.09	1.07
Expenditure deviation is always within the acceptable variance of ($\pm 10\%$)	50	3.61	0.94
The organization has proper control mechanism over purchases	50	3.81	0.94
The organization has proper control mechanisms over all payment processes	50	3.89	1.08
Average	50	3.82	0.76

Primary Data (2021)

Further, findings shown that many respondents concurred that quality of services has been increasing over time (Mean=3.82, std. dev=1.19). Further, findings showed that most respondents concurred that their organization has proper control mechanism over purchases (Mean=3.81, std. dev=0.94). A significant number of respondents agreed that organization has flexibility to adjust budgets to meet changes in programming (Mean=3.79, std. dev=0.88). Finally, the respondents agreed with the statement that expenditure deviation is always within the acceptable variance of ($\pm 10\%$) (Mean=3.61, std. dev=0.94). The overall mean was 3.82 and the standard deviation was 0.76 suggesting that for most of the statements regarding firm performance, respondents were agreeing.

4.5 Inferential Statistics

This part comprises the inferential statistics for all of the variables. Pearson correlations as well as multiple regressions were used as inferential statistics. To establish the association between all the variables Pearson correlation was utilized whereas regression was done to establish the association between Digitalization (materials management, production planning, distribution management and quality management) and HIV comprehensive care centre services' performance.

4.5.1 Correlation Analysis

The correlation analysis assisted in signifying the association between the dependent and independent variables. This involved the r coefficient as well as whether the association is positive or negative. This is as exemplified in Table 4.11.

The correlation outcomes demonstrate a weak, positive association between human resource processes and HIV comprehensive care centre services' performance as reflected by a 0.232 Pearson correlation coefficient as well as a 0.019 P-value. Results of correlation too establish a weak, positive association between financial management processes and HIV comprehensive care centre services' performance as depicted by a 0.272 Pearson correlation coefficient and a 0.006 P-value.

The results also demonstrate a weak, positive association between procurement processes and HIV comprehensive care centre services' performance as reflected by a 0.324 Pearson correlation coefficient and a 0.001 P-value. Results of correlation too establish a weak, positive and substantial association between programmatic management processes and HIV comprehensive care centre services' performance as depicted by a 0.358 Pearson correlation coefficient and a 0.000 P-value.

Table 4.11: Correlation Results

		Firm performance	HRP	FMP	PP	PMP	QAP	DMS
Firm performance	Pearson Correlation	1						
	Sig. (2-tailed)							
HRP	Pearson Correlation	.232*	1					
	Sig. (2-tailed)	.019						
FMP	Pearson Correlation	.272**	.540**	1				
	Sig. (2-tailed)	.006	.000					
PP	Pearson Correlation	.324**	.470**	.718**	1			
	Sig. (2-tailed)	.001	.000	.000				
PMP	Pearson Correlation	.358**	.378**	.529**	.736**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
QAP	Pearson Correlation	.322**	.419**	.460**	.694**	.725**	1	
	Sig. (2-tailed)	.001	.000	.000	.000	.000		
DMS	Pearson Correlation	.595**	.310**	.342**	.362**	.383**	.364**	1
	Sig. (2-tailed)	.000	.001	.000	.000	.000	.000	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
c. Listwise N=50

Primary Data (2021)

Moreover, the results of correlation demonstrate a weak, positive as well as substantial association between quality assurance practices and HIV comprehensive care centers' performance as depicted by a 0.322 Pearson correlation coefficient and a 0.000 P-value.

Finally, the outcomes of correlation revealed the existence of a strong, positive and

substantial correlation between data management systems and HIV comprehensive care centre services' performance as evidenced by a 0.576 Pearson correlation and a 0.000 P value.

4.5.2 Regression Analysis

The regression analysis incorporates the model fitness, the Analysis of Variance (ANOVA) as well as the regression coefficients. This is as verified in underneath.

Table 4.12: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791 ^a	.625	.621	.29172

a. Predictors: (Constant), Data management systems, Human resource processes, Programmatic management processes, Financial management processes, Quality assurance practices, Procurement processes

Primary Data (2021)

Data management systems, Human resource processes, Programmatic management processes, financial management processes, Quality assurance practices and Procurement processes were considered satisfactory in explaining HIV comprehensive care centre services' performance as presented in Table 4.12. This is as reflected by an R square of 0.625. This thus implies that materials management, production planning, distribution management and quality management account for 62.5% in HIV comprehensive care centre services' performance variations with factors beyond the research explaining the difference. The other inference is that the model linking the variables relationships is satisfactory. The 0.791 R value implies presence of strong relationship between the predictor variables (data management systems, human resource processes, programmatic

management processes, financial management processes, quality assurance practices, procurement processes) and performance of HIV comprehensive care centre services.

Table 4.13: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.661	6	1.777	4.247	.000 ^b
	Residual	17.988	43	.418		
	Total	28.649	49			

a. Dependent Variable: Firm performance
b. Predictors: (Constant), Data management systems, Human resource processes, Programmatic management processes, Financial management processes, Quality assurance practices, Procurement processes

Primary Data (2021)

Table 4.13 outcomes confirm the model appropriateness and this is depicted by 4.247 F statistic as well as 0.000 p value. This shows that data management systems, human resource processes, programmatic management processes, financial management processes, quality assurance practices and procurement processes are good predictors of HIV comprehensive care centre services' performance. The regression analysis helped to demonstrate the magnitude of influence of data management systems, human resource processes, programmatic management processes, financial management processes, quality assurance practices and procurement processes have on HIV comprehensive care centre services' performance.

Table 4.14: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
	(Constant)	1.945	.287		6.773	.000
1	HRP	.414	.065	.397	3.978	.000
	FMP	.675	.075	.604	6.108	.000
	PP	.464	.150	.447	4.428	.000
	PMP	.514	.097	.566	5.297	.000
	QAP	.312	.111	.300	3.649	.000
	DMS	.552	.060	.532	5.880	.000

a. Dependent Variable: Performance

Conclusions depicted a positive significant effect of human resource processes on HIV comprehensive care centre services' performance (β 0.414, P 0.000). The results also portrayed a positive significant effect of financial management processes on HIV comprehensive care centre services' performance (β 0.675, P 0.000). The outcomes demonstrated a positive significant effect of procurement processes on HIV comprehensive care centre services' performance (β 0.464, P 0.000). Further, results demonstrated a positive substantial effect of programmatic management processes on HIV comprehensive care centre services' performance (β 0.514, P 0.000). Results also demonstrated a positive substantial effect of quality management practices on HIV comprehensive care centre services' performance (β 0.312, P 0.000). Finally, results revealed a positive substantial effect of data management systems on HIV comprehensive care centre services' performance (β 0.552, P 0.000)

The following is the regression model that resulted:

$$Y = 1.945 + 0.414X_1 + 0.675X_2 + 0.464X_3 + 0.514X_4 + 0.312X_5 + 0.552X_6 + \epsilon$$

Where

Y = Firm performance,

X₁ – Human resource processes,

X₂ – Financial management processes,

X₃ – Procurement processes,

X₄ – Programmatic management processes

X₅ – Quality management practices,

X₆ – Data management systems

4.6 Challenges Facing Adoption of Digitalization

The mean and standard deviation for the specific challenges facing digitalization adoption are as Table 4.15 displays. The results reveal that HIV comprehensive care centres are not facing digitalization challenges to a great extent. This is evidenced by the fact that the mean scores for all of the listed challenges were less than 3 on a five-point Likert scale.

The respondents disagreed that they are facing poor technical support from ICT vendors, lack of technical knowhow among the staff, lack of top management support and change resistance. The respondents failed to agree or disagree with the statement that they face high financial costs and patients' inability to use digital systems. Further, the respondents also disagreed that they are facing a challenge of poor coordination and communication, inadequate resources for user training and concerns by patients on matters of privacy and confidentiality.

Table 4.15: Descriptive Statistics for Challenges Facing Digitalization

Statement	N	Mean	Std. Dev
Poor technical support from ICT vendors	50	2.47	1.14
High financial costs	50	3.10	1.11
Lack of technical knowhow among the staff	50	2.75	1.14
Lack of top management support	50	2.26	1.04
Resistance to change	50	2.48	1.19
Poor coordination and communication	50	2.28	1.00
Inadequate resources for user training	50	2.89	1.17
Patients inability to use digital systems	50	3.06	1.17
Concerns by patients on matters of Privacy and Confidentiality	50	2.77	1.39
Average	50	2.68	0.76

Primary Data (2021)**4.7 Discussion of Findings**

This research sought to determine the degree of digitalization adoption among HIV comprehensive care centres in Kenya and to determine the influence of digitalization adoption on performance among these centres. Further, the study also sought to establish challenges facing HIV comprehensive care centre services in adopting digitalization. Digitalization adoption was broken down into data management systems, human resource processes, programmatic management processes, financial management processes, quality assurance practices and procurement processes while performance was operationalized in terms of timeliness, cost reduction, quality of services and flexibility. The findings indicate that digitalization has been adopted by HIV comprehensive care centres to great extent and that this has significantly enhanced performance among these firms.

The research conclusions correspond with those of Jela (2013) who conducted a study on adoption of technology in supply chains for large manufacturing firms in Nairobi. The study sought to find out; the determinants of technology adoption in a company's supply chain, determine supply chain adoption level and determine the degree that technology adoption in the firm supply chain affects its performance. A total of 64 firms were randomly selected for interviews using questionnaires. Descriptive statistics and linear regression were the methods used for data analysis. Outcomes demonstrated that; technology use in supply chain enhances the effectiveness and efficiency of operations. Similarly having supply chains that have embrace technology serves a competitive advantage over other organization.

The conclusions are also support Odhiambo (2013) who examined ICT use in high schools in the district of Rachuonyo South, Homa-Bay, Kenya. 320 students, 24 teachers and 8 heads of high school were sampled in the research, and a questionnaire administered to them. The study revealed that ICT was an incredibly powerful tool in teaching and learning process. Students who are constantly exposed to ICT skills changed their views on both education and ICT and ICT strengthened teachers ' efficiency and effectiveness in their work. The findings support existing knowledge on how ICT leads to efficiency and effectiveness in service delivery.

This was also supported by Gules et al. (2012) who studied the impact supply chains and information technologies might have on business performance in Turkey. Case study approach is used to analyze this objective. More specifically the study was conducted on industries producing Fast Moving Consumer Goods. The authors modeled supply, production and distribution activities to be short, medium and long-term operations.

Results showed that including information technologies in supply chains has a linear / direct effect on business performance at different criterion.

In regard to challenges facing digitalization adoption, respondents disagreed that they are facing poor technical support from ICT vendors, lack of technical knowhow among the staff, lack of top management support and change resistance. The respondents failed to agree or disagree with the statement that they face high financial costs and patients' inability to use digital systems. Further, the respondents also disagreed that they are facing a challenge of poor coordination and communication, inadequate resources for user training and concerns by patients on matters of privacy and confidentiality.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Outlined in this section is the summary, conclusion, as well as recommendations. The study's summary, conclusion, and suggestions for improvement are all presented in accordance with the study's research objectives. Recommendations for further research and limitations of the study are too offered in the chapter.

5.2 Summary of Findings

The research's main objective was determining digitalization adoption influence on HIV comprehensive care centre services' in Kenya performance. The research was anchored on system theory of profound knowledge, the technology acceptance model and the process approach model. Firm performance was the dependent variable that was represented by timeliness, cost reduction, quality of services and flexibility operationalized using likert scale questions. The independent variables were data management systems, human resource processes, programmatic management processes, financial management processes, quality assurance practices and procurement processes. Descriptive survey design was adopted in the research. All 100 HIV comprehensive care centre services within Nakuru County were included in the target population.

The sample size was arrived at using Yamane formula. A structured questionnaire was presented to ICT staff, care clinic staff, M&E division manager and project managers of HIV comprehensive care centres in Kenya via Google forms to obtain primary data. 50 questionnaires were obtained in the follow-up, yielding a response rate of 66.7 percent. Descriptive statistics, correlation, and regression analysis were utilized to analyze the

data. The significance every independent variable on performance was determined through a multivariate linear regression model as well as the t-statistic.

The research's first objective was assessing the extent of digitalization among HIV comprehensive care centres in Kenya. The findings show that HIV comprehensive care centres have embraced digitalization to a large extent. The fact that the mean scores for qualities linked to digitalization were more than 3 on a five-point likert scale supports this. The descriptive analysis too discovered that HIV comprehensive care centres in Kenya have digitalized data management systems, human resource processes, programmatic management processes, financial management processes, quality assurance practices and procurement processes.

The research's second objective was determining influence of digitalization adoption on performance of Kenya's HIV comprehensive care centre services. Conclusions depicted a positive significant effect of human resource processes on HIV comprehensive care centre services' performance. The results also portrayed a positive significant effect of financial management processes on HIV comprehensive care centre services' performance. The outcomes yielded a positive significant effect of procurement processes on HIV comprehensive care centre services' performance. Further, results demonstrated a positive substantial effect of programmatic management processes on HIV comprehensive care centre services' performance. Results also demonstrated a positive substantial effect of quality management practices on HIV comprehensive care centre services' performance. Finally, results showed a positive substantial effect of data management systems on HIV comprehensive care centre services' performance.

The research's third objective was to establish challenges facing HIV comprehensive care centres in adopting Digitalization. The study revealed that that respondents disagreed that they are facing poor technical support from ICT vendors, lack of technical knowhow among the staff, lack of top management support and change resistance. The respondents failed to agree or disagree with the statement that they face high financial costs and patients' inability to use digital systems. Further, the respondents also disagreed that they are facing a challenge of poor coordination and communication, inadequate resources for user training and concerns by patients on matters of privacy and confidentiality.

5.3 Conclusions

For each of the research objectives, this segment summarizes the conclusions taken from the research results. The conclusion was that digitalization have been adopted to a great level by Kenyan HIV comprehensive care centres. This is reinforced by the reality that in a 5-point Likert scale, all the selected measures of digitalization adoption had means greater than three. Data management systems, human resource processes, programmatic management processes, financial management processes, quality assurance practices and procurement processes have all been adopted to a significant level.

The conclusion was that there exists a positive substantial effect of human resource processes on HIV comprehensive care centre services' performance. Financial management processes also have a positive effect on HIV comprehensive care centre services' performance. Further, the study concludes that there is a positive substantial effect of procurement processes on HIV comprehensive care centre services' performance.

The study further concludes that a positive substantial effect of programmatic management processes on HIV comprehensive care centre services' performance exists and that quality management practices have a positive significant effect on HIV comprehensive care centre services' performance. Finally, the study concludes that a positive substantial effect of data management systems on HIV comprehensive care centre services' performance exists.

The study also concludes that HIV comprehensive care centres in Kenya are not facing poor technical support from ICT vendors, have technical knowhow among the staff, have top management support and there is no resistance to change. The study never agreed or disagreed with the statements that they face high financial costs and patients' inability to use digital systems. Further, HIV comprehensive care centres in Kenya are not facing a challenge of poor coordination and communication, inadequate resources for user training and concerns by patients on matters of privacy and confidentiality.

5.4 Recommendations for Policy and Practice

The research revealed that digitalization of human resource processes influenced HIV comprehensive care centre services' performance positively. According to the findings, management of HIV comprehensive care centres that are yet to digitize their human resource processes should do so as this will positively affect firm performance. Correspondingly, the research suggests that providers of digitalization should ensure that the systems are well equipped with features that will enable efficient human resource processes.

The research revealed that digitalization of financial management processes influenced HIV comprehensive care centre services' performance positively. According to the findings, management of HIV comprehensive care centres that are yet to digitize their financial management processes should do so as this will positively affect firm performance. Correspondingly, the research suggests that providers of digitalization should ensure that the systems are well equipped with features that will enable efficient financial management processes

The research revealed that digitalization of procurement processes influenced HIV comprehensive care centre services' performance positively. According to the findings, management of HIV comprehensive care centres that are yet to digitize their procurement processes should do so as this will positively affect firm performance. Correspondingly, the research suggests that providers of digitalization should ensure that the systems are well equipped with features that will enable efficient procurement resource processes.

The research revealed that digitalization of data management systems influenced HIV comprehensive care centre services' performance positively. According to the findings, management of HIV comprehensive care centres that are yet to digitize their data management systems should do so as this positively affect firm performance. Correspondingly, the research suggests that providers of digitalization should ensure that the systems are well equipped with features that will enable efficient data management systems.

5.5 Limitations of the Study

Primary data was utilized in this study. To minimize the number of likely outliers, a structured questionnaire was used in the research. This may, however, pose the issue of biased data collecting because the respondents in question are restricted in how and how much they should provide. In this respect, the researcher made sure that the data collecting instrument enables complete data gathering which meets study aims as easily as feasible.

In addition, several of the respondents were skeptical about participating in the research. The researcher rectified this issue by obtaining required permission, authorization and permissions from the authorities concerned, including the University. In addition, ethical concerns were taken into account. Finally, the researcher stated willingness to share the study with interested participants.

The focus was on some of the characteristics that are thought to influence performance among Kenyan HIV comprehensive care centres. The research centered on six explanatory variables in particular. Nevertheless, there are additional factors that are expected to influence the performance of these firms. Others are external, political interference, whereas some are internal, like organization culture, process improvements, as well as top management support.

5.6 Suggestions for Further Research

The R^2 showed a variation of 62.5% which implies that other variables not considered in this study explains 37.5% of changes in firm performance. As a consequence, future study may concentrate on other variables influencing firm performance such as top

management support and the type of systems in place. Policymakers would be able to devise and firmly implement an effective apparatus to improve performance by determining how each of the factor influences firm performance.

This research focus was on digitalization adoption effect on performance among Kenyan HIV comprehensive care centre services. As a result, for comparative purposes, comparable research can be conducted across firms in various sectors such as manufacturing, tourism, insurance, banking, investment, commercial, as well as service firms, among others.

Finally, this research relied on a multiple linear regression model, which has drawbacks, such as errors and misleading results when a variable is changed. Future academics should investigate the many relationships between digitalization and firm performance using models like the Vector Error Correction Model (VECM).

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APPENDICES

Appendix I: Research Questionnaire

Instructions

Data collected in this survey is intended for academic purposes only and will be used in partial fulfillment of a Masters Research project to examine the effect of Digitalization on performance of HIV comprehensive care centers in Kenya. All information gathered will be handled with strict confidentiality. There are 5 sections.

SECTION A: BACKGROUND INFORMATION

Respondents General Information

1. Gender

Male []

Female []

2. Age

18-24 []

25-35 []

50-45 []

46-55 []

Above 55 []

3. Highest level of education (tick one)

Diploma

Undergraduate

- Graduate
- Others (Please specify)_____

4. Years of experience in the organization

- 0-1 year []
- 2-4 years []
- 5-7 years []
- 8-10 years []
- Above 10 years []

5. Position in the organization

Firm General Information

6. How old is the organization

- Below 5 years []
- 5-10 years []
- 11-15 years []
- 16-20 years []
- Above 20 years []

7. Who is the sponsor of the organization

- Missionary (Christian, Muslim, Hindu, Jewish etc.) []
- Non-Governmental Organization []
- Government []
- Others (Specify) []

8. How many employees do you have in the organization?

a) Less than 5 [] b) 5 – 10 employees [] c) 11 – 20 employees []

d) 21 – 35 employees [] e) 50 – 50 employees []

SECTION B: DIGITALIZATION ADOPTION

9. Kindly indicate the extent to which you agree to each of the following statements in regard to digitalization in your organization. Use the following scale: **1- Strongly Disagree, 2- Disagree, 3- Neither Disagree nor Agree, 4- Agree, 5- Strongly Agree**

	Statement	1	2	3	4	5
1	All human resources (HR) processes in the organization are computerized					
2	All financial management processes in the organization are computerized					
3	All procurement processes in our organization are computerized					
4	All programmatic management processes in the organization are computerized.					
5	All quality assurance practices in the organization are computerized.					
6	All staff are trained on basic use of computer system in our organization					
7	There is always steady internet in the organization					
8	All staff use the system in their work					
9	There are data management systems in the organization.					

PART C: FIRM PERFORMANCE

10. Kindly indicate the extent to which you agree with each of the statements on your HIV comprehensive care service centre performance by using the following scale:

Use the following scale: **1- Strongly Disagree, 2- Disagree, 3- Neither Disagree nor Agree, 4- Agree, 5- Strongly Agree**

	Statement	1	2	3	4	5
1	All our services are offered within the set timelines					
2	The cost of running our services has been reducing with time					
3	The quality of our services has been increasing over time					
4	Expenditure in the organization is incurred as per the work plans					
5	The organization has flexibility to adjust budgets to meet changes in programming.					
6	The organization maintains proper records					
7	Expenditure deviation is always within the acceptable variance of ($\pm 10\%$)					
8	The organization has proper control mechanism over purchases					
9	The organization has proper control mechanisms over all payment processes					

PART D: CHALLENGES FACING DIGITALIZATION

11. In a scale of 1 to 5, indicate the extent to which you are facing the following challenges, where **1- Strongly Disagree, 2- Disagree, 3- Neither Disagree nor Agree, 4- Agree, 5- Strongly Agree**

	Statement	1	2	3	4	5
1	Poor technical support from ICT vendors					
2	High financial costs					
3	Lack of technical knowhow among the staff					
4	Lack of top management support					
5	Resistance to change					
6	Poor coordination and communication					
7	Inadequate resources for user training					
8	Patients inability to use digital systems					
9	Concerns by patients on matters of Privacy and Confidentiality					

Thank you for your participation