

**CLOUD RECORD MAINTENANCE IN TECHNICAL VOCATIONAL
EDUCATION TRAINING INSTITUTIONS IN KENYA: A CASE STUDY OF
NYANDARUA INSTITUTE OF SCIENCE AND TECHNOLOGY**

BY

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DECLARATION

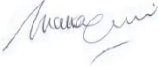
This thesis is my original work and has not been presented for a degree or any other award in any other University.

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DEDICATION

Gracefully dedicated to my amazing mother, Regina Wairimu.

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ABSTRACT

This study aimed at determining the challenges of record maintenance at the Nyandarua Institute of Science and Technology. The specific objectives of the study were; to determine the effect of cloud network accessibility on record maintenance, to establish the effect of cost of cloud on record maintenance, to examine the effect of cloud shared infrastructure on record maintenance, and determine the effect of cloud network security on record maintenance at Nyandarua Institute of Science and Technology. This study involved 125 respondents drawn from the Institution. A mixed research design was used. The researcher used a census of all the teaching staff, HODs, and the administrative staff that added up to 125 respondents. Content and construct validity were done by administering questionnaires to 10 respondents in the Nyeri Technical Institute. The Cronbach alpha coefficients were obtained from the SPSS to determine the internal consistency of the questionnaire in measuring the cost-effectiveness, data security, shareability, and accessibility of the cloud technology. The scores of the alphas were network accessibility $\alpha = .809$, Cost of Cloud $\alpha = .788$ and Shared infrastructure $\alpha = .756$ and Network security $\alpha = .789$ which were all over 0.7 and were sufficient confirmation of data reliability for the independent variables. Data collected was compiled, sorted, edited, classified, and coded in readiness for analysis. It was analyzed using the SPSS software. The relationship between variables was established through correlation analysis. The regression analysis and ANOVA were used to test the significance of the independent variables on record maintenance. The response rate was 92% since 115 out of 125 questionnaires were received and used for analysis. The model explained 75.7% of the variations in record maintenance. The model fit was significant for the data since the F-value was 33.752 at $p = .0051$ which was significant since p was less than 0.05 with 111 degrees of freedom which implies that Network accessibility, Cloud Cost, Shared infrastructure and network security have a significant, combined effect on record maintenance. Therefore, the study stated that cloud technology has a significant effect on record maintenance at the Nyandarua Institute of Science and Technology. Analysis of regression model coefficients was carried out and the results showed a positive constant of 2.875. The constant and all the independent variables were significant since their p -values were all less than 0.05. The study concluded that cloud technology will facilitate record maintenance. The study recommends that cloud network accessibility; cloud cost, cloud shared infrastructure, and cloud network security contribute significantly to cloud record maintenance.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

According to the Armbrust (2018), a record can be described as a document generated by an individual or entity for day to day business operations which require it to be retained for future use. (Sahay, 2017) represent the entity's memory and the definition of a record ranges from the physical description in terms of appearance to the record contents, size, and format which often differs from organization to organization (Kaur &Pateriya, 2017).

Armbrust (2018) states that a record is a piece of information stored in a form that allows further duplication and storage in diverse user-friendly formats which are meant to initiate and enhance business day to day activities of an organization. Such records may be kept to meet legal requirements and organizational policy. Therefore, according to Armbrust (2018) records are actually the product of an entity; they are a tool for appraising employee output as well as ensuring accountability and providing proof of actual organization operations and activities. The same sentiments were shared by Ramandeep and Kumar, (2018) who observed that an organization without proper records cannot keep track of its crucial information and that loss of information trail is the loss of memory. Records are important since they contain legal and evidential values, also records are kept since they contain an administrative and economical value that facilitates in decision-making by organizations, therefore the need for proper care and maintenance of records.

1.1.1 Records Maintenance

The free flow of information within and without the organization is the function of record maintenance. Such information must be available on a real-time basis in the required format with complete content. That calls for efficient and effective records management programs as was advocated by (Sahay, 2017) who also recommended that record officers and managers of information systems should help users execute their job more easily and effectively by availing required information on-demand basis. Further, Sahay noted that

information is an important resource which should be managed and given preference just like financial resources, human resource, and even estate. Therefore, it is essential for any entity be it private or public to document all its activities in the form of records that act as a memory for the organization. Such records should preferably be in reproducible formats to further enhance organization management (Kaur &Pateriya, 2017).

Records offer necessary support to management in the formation and implementation of policy as well as supporting the day to and decision making, they at as a confirmation of selected course of action and safeguard the interests of the organization, the rights of employees, the customers and the general citizenry. Therefore, records enable organizations to operate in a consistent and equitable manner (Nakpodia, 2017). The importance of record management cannot, therefore, be ignored since, without an efficient and reliable record management system, the conduct of business operations will be impossible in a modern business environment which requires accountability of previous events as a basis for decisions about the future. Therefore, records are treated as a corporate asset that provides proof of actions and decisions made. Relevant information ensures certainty in the decision-making process and certainty of the decisions themselves and as such information should flow throughout the organization for easy tapping at the point of need. Such can only be achieved if there is a good, efficient, effective record management system (Joshua &Ogwueleka, 2018).

1.1.2 Cloud Technology

Through cloudtechnology, the organization's users can rapidly access information resources maintained in the form of records without having to involve the service provider directly or with very minimal interaction with the service provider (Mell &Grance, 2017). The common business applications such as electronic mail and document creation are common cloud computing services that can be accessed online through a web browser but retaining the software and data within the servers of the service provider. Therefore, cloud technology can be thought of as comprising both hardware and software that manages the data center and enhances a created cloud computing model. According to De Borja (2018) states that Cloud Technology is an emerging technology that allows and facilitates temporary utilization of computer infrastructure connected to a network created and supplied by the cloud service provider.

Therefore, cloud technology involves supplied applications, hardware, and software that provide services in data centers. The software part is referred to as Software as a service (SaaS) while the data center hardware and software is referred to as a Cloud technology which when made available in a pay-as-you-go manner to the general public, it is called a Public Cloud; the service being sold is Utility (Kaur &Pateriya, 2017).Ogwueleka (2018) noted that the rapid growth of cloud technology in the previous years has created a lot of interest among online and IT users and enthusiasts seeking utility from the available services and applications on the web in what is called a service on-demand model where the billing is based on the usage. Therefore, the cloud technology model is more economic for information and communication technologies. Further, with organizations, institutions that have a cloud technology don't have to spend heavily on older, inefficient and ineffective models but should instead migrate to cloud models that can be purchased or leased online. Such institutions will be free of internal management costs since the Information Technology resources are managed and administered by the cloud technology vendor. The users need not acquire hardware components but to access the storage services, shared files and internet applications, they just need to pay for such services online (De Borja, 2018). Cloud technology will be particularly more useful to Nyandarua Institute of Science and Technology aiming at delivering high-quality services to both internal and external customers on a timely basis.

Cloud technology has been perceived as one of the most notable technological milestones of this century and if applied well can help overcome the challenges of record management related challenges experienced in most organizations both in developing and developed countries as long the supporting technology is implemented in such a manner that makes users have confidence. The current network world in which entities operate in make cloud technology have numerous applications especially with the search engines using cloud technology such as WWW.amazon.com, hot-mail.com, Facebook.com, linkedln.com, etc which demand that for an organization to succeed in employing external services like PaaS, IaaS and SaaS, security threats and risks need to be identified through an effective risk assessment program to get rid of both privacy and compliance risks (De Borja, 2018).

Kambil (2017) states that there are many advantages of using cloud technology which include but not limited to pay-for-use, speedy execution, minimal costs, rapid and easy scalability as well as elasticity, low cost of disaster recovery, data storage solutions, better network accessibility, prompt detection of any system interference, reliable security controls and speedy service resumption after any interruption. Further, Kambil (2017) noted that cloud technology ensures that all data and applications are safely kept in diversely located data centers which at times pose data security challenges due to low levels of trust. The challenges that often lead to low trustworthy include; vulnerability of web-based applications, concerns of controls and privacy emanating from third party control of data. The challenges related to credential and identity management, interference's, verification of data, loss of data, lack of confidentiality and theft, failure to accurately authenticate respondent devices and spoofing of internet protocol are also notable challenges (Munene & Macharia, 2015).

1.1.3 Regional Context

In Africa, many cloud technology projects are still in the development stage are underway (Kambil, 2017). The partnerships between local and foreign players have led to the tremendous growth of cloud technology initiatives making many African players see the benefits of such ventures related to advanced IT service providers such as cloud technology and realizing the appropriate implications to the African context. Therefore, various stakeholders have shown tremendous interest in tapping into the benefits of cloud technology regardless of the few technical challenges and regulatory hindrances associated with the deployment of cloud technology (Kiura, 2017).

The situation in Africa is characterized by technical and financial resources which fail to meet the threshold of the requirements for the new technology making it necessary to institute training and organizational strengthening program within institutions in African countries to enhance the capacity of the African players in the cloud technology (Kambil, 2017). It has not been easy to either access or develops robust information technology infrastructure in Africa's developing countries. However emerging technologies have provided though minimum, access to IT resources that were previously almost impossible to access and therefore the coming up of cloud technology will increase the stakes for users be they entrepreneurs, micro, medium and large businesses, scholars as well as

governments (Greengard,2018). The focus of this study is on the implications of cloud technology on record management in TVET institutions in Kenya. African countries have experienced an increase in internet use in the past four years according to Stork *et al.*, (2018) who also noted that in East Africa the growth has been significant with Uganda, Ethiopia and Rwanda the usage has tripled. Ethiopia experienced a fixed-line penetration with 4% of households having a fixed-line phone and Daily use rose over the past four years compared to once-a-week and once-a-month use, in particular in Rwanda and Ethiopia (Stork *et al.*, 2018).

1.1.4 Kenyan Situation

The government of Kenya, having noted the significant digital disparities between countries that have embraced the usage of information technology and those that have not and also have realized the disparities between the rural and urban population in information technology implementation has made it her objective to act and minimize the disparity existing in various sectors. According to the Kenya IT Policy statement of (2017), the government of Kenya recognizes the important role of IT as a resource that must be organized, secured and preserved for the prosperity of the country (Kenya ICT Policy [KICTP], 2017).

The government is now using e-government as a mechanism to promote and sustain internal efficiency and improve the quality of public service delivery as well as combat corruption. Therefore, the use of information technology is encouraged in learning institutions such as schools, colleges, and universities to improve the quality and manner of delivery in teaching and learning. There has been diffusion of cloud technology in the learning aspects of Kenya's learning institutions. However, managers of learning institutions and ICT managers need to understand clearly the benefits of cloud technology, its challenges and how to overcome them so as to tap on the benefits which accrue from the installation of such platform such as minimized operational costs, data security and increased internal IT efficiency as well as compliance.

According to United Nations Development Programme [UNDP] (2017), the most prevalent challenge facing tertiary institutions in Kenya is fragmentation and donor dependencies and therefore the growth of cloud technology will go a long way in curbing the challenge by enabling such institutions integrate data from several independent to

interdependent programs and allowing data to be maintained in a single, cost-effectiveness, accessible and sustainable repository. Also, the financial aspect has been a factor of cloud technology in tertiary institutions in Kenya. Cloud technology has been found to be cost-effective models elsewhere as opposed to managing on-premises data centers. Therefore, institutions can make use of web-based systems with very little infrastructural costs; they can even pay for services before instituting their own servers (Rukwaro, 2017).

1.1.5 Technical and Vocational Education and Training (TVET) in Kenya

Technical vocational education and training (TVET) is a comprehensive term referring to the educational process. It involves, in addition to general education, the study of technologies and related sciences and the acquisition of practice, skills, and knowledge relating to occupation in various sectors of economic and social life (United Nations Educational, Scientific and Cultural Organization [UNESCO], 1984). In the present study, the concept of vocational education implies the preparation of an individual for an occupation or career. This involves both the liberal and technical aspects of education.

The liberal aspects include the philosophical, moral and cultural elements that an individual must possess to fit into a given society.

Technical aspects include the knowledge and skills required to perform a job successfully. TVET is the major connecting link between the school system and the employment market, which means that developments in TVET are intimately linked to general trends in the economy (UNESCO, 1990). Furthermore, the growing dissatisfaction with formal academic education, particularly its failure to provide the much-needed skill training for employment, self-reliance and so on, implies that Kenya should evolve some positive economic policy measures to be directed at reviving, reactivating, restructuring and reorganizing the informal sector of the economy to satisfy our needs for technological advancement. It is an indisputable fact that a large number of young men and women don't meet the entry requirements for public universities. Their only hope of continuing their education would be through middle-level colleges offering TVET programs. This route is currently being developed into one of the ways through which learners may proceed to higher levels of technical training.

Education is an important threshold for the socio-economic empowerment of youth. As a transformational tool, it instills in youth the right set of knowledge, skills, and competencies necessary for a fulfilling career and a stable social life. Through education, youth are better equipped with tools to actively engage in economic productivity. Technical and Vocational Education and Training (TVET), as conceptualized by Leon Tikly (UNESCO – UNEVOC 2018) is an important source contributing a pool of skilled workers to the labor market (Kraguland& Hansen, 2018). The skills acquired through TVET enable young people to engage in productive employment, earn income and overcome abject poverty and social exclusion. Developed countries such as Italy, Sweden, Brazil, Japan, and China, are cognizant of these changes and have taken prompt measures to increase funding for TVET institutions. As a result, students from these countries are more exposed to vocational training and to a culture of scientific investigation and application at an early age (Nyerere, 2017). Other countries like Denmark are also undertaking serious TVET reforms, strengthening linkages between schooling and work experience as well as providing adult workers with limited experience and skills an opportunity to upgrade (Kraguland& Hansen, 2018).Europe, in general, has about 50 percent of students in upper secondary education pursuing vocational education while China, India, and South East Asia the figure is about 35 to 40 percent, Africa, however, still lags behind at about 20 percent (Nyerere, 2017).

1.1.6 Nyandarua Institute of Science and Technology

Nyandarua Institute of Science and Technology was started as a Public Technical Training Institution as initiatives of the people of Nyandarua District through a fund drive in 1996. Later in the year 2003, the Constituency development fund (CDF) completed many projects in the institute and the first batch of students was enrolled in 2017. As at the end of the year 2017 the institution had over 1000 students. The institution is now a recognized public Technical training institute mandated to offer technical and Vocational Education. The institution is ISO 9001:2015 certified in the year 2018. The Institution has made efforts in achieving vision 2030. The study was based on the Nyandarua Institute of Science and technology which is a technical training institution.

1.2 Statement of the Problem

Records maintenance has in the recent past received increasing support and attention in the global world as governments embrace information technologies in the management of their corporate records. (Senarathna *et al.*,2018).A World-Bank supported study shows that East Asian countries such as China, South Korea, and Malaysia also achieved their industrialization because they invested heavily in Vocational Training, attaining a 50% percent enrolment compared to other disciplines (World Bank [WB], 2018).

According to UNDP (2017), the most prevalent challenge facing tertiary institutions in Kenya is fragmentation and therefore the provision of connectivity will go a long way in curbing the challenge by enabling such institutions to integrate data. Reforms in Technical and Vocational education and Training were also targeting to broaden the uptake to their enrolment rate over one million students Ministry of Education, Science, and Technology, 2018).

Maintenance of records has been a problem in Nyandarua Institute of Science and Technology due to the difficulties encountered in tracing and retrieving records, the records available have been in a poor state and in some cases cannot be traced at all (Nyandarua Institute Board of Management report, 2018).The process of records accessibility is not easy due to the long-time took causing dissatisfaction to the students. The rapid increase in the number of students at Nyandarua Institute has also led to a corresponding increase in the volume and complexity of students' records due to the reforms in Technical and Vocational education and Training which are targeting to broaden the uptake to their enrolment rate over one million student (Ministry of Education, Science, and Technology, 2018). This has caused problems in the decision-making process and causing ineffectiveness when serving the students. The study sought to address these challenges of record maintenance.

1.3 Aim of the study

This study aimed at determining the challenges of record maintenance at the Nyandarua Institute of Science and Technology.

1.4 Objectives

Specific objectives that guided the study were;

- i. To determine the effect of cloud network accessibility on record maintenance at Nyandarua Institute of Science and Technology.
- ii. To establish the effect of the cost of cloud on record maintenance at Nyandarua Institute of Science and Technology.
- iii. To examine the effect of shared cloud infrastructure on record maintenance at Nyandarua Institute of Science and Technology.
- iv. To investigate the effect of cloud network security on record maintenance at Nyandarua Institute of Science and Technology.

1.5 Research questions

Research questions of the study were;

- i. What is the effect cloud network accessibility on record maintenance at Nyandarua Institute of Science and Technology?
- ii. What is the effect of the cost of cloud on record maintenance at the Nyandarua Institute of Science and Technology?
- iii. What is the effect of shared cloud infrastructure on record maintenance at the Nyandarua Institute of Science and Technology?
- iv. What is the effect of cloud network security on record maintenance at the Nyandarua Institute of Science and Technology?

1.6 Assumptions of the study

The study was guided by the following assumptions:

Network accessibility in the Nyandarua Institute of Science and Technology will positively affect the effective maintenance of records.

ICT infrastructure at Nyandarua Institute of Science and Technology is adequate to support record maintenance.

It is possible to develop a suitable cloud technology for effective record maintenance at the Nyandarua Institute of Science and Technology.

1.7 Justification of the study

The research objectives will emphasize the need to adopt cloud record maintenance so as to promote data security and integrity and therefore get rid of the consequences of insecure data such as legal suits and loss of goodwill. The management of tertiary institutions will be in a position to make good decisions based on the available well-secured data about the institution. Good decisions are made based on correct information. Therefore, cloud technology enables such institutions to keep records for future use in decision making. The staff will experience better service delivery since all the required information, records and data will be readily available in the required format and on-demand. The learners too will enjoy improved service delivery that will translate to better performance.

1.8 Significance of the study

Study will enable the institute and other similar institutions to adopt cloud technology and enjoy the benefits of having electronic record systems. These benefits are in the form of reduced costs, easy sharing of data and security of data. The institution employees and other stakeholders will appreciate the benefits of cloud technology in making their work easier and effective.

It is further hoped that the study will help determine the effect of cloud network accessibility on record maintenance at Nyandarua Institute of Science and Technology.

The study will help establish the effect of the cost of cloud on record maintenance at the Nyandarua Institute of Science and Technology.

The study will examine the effect of shared cloud infrastructure on record maintenance at the Nyandarua Institute of Science and Technology.

The study will investigate the effect of cloud network security on record maintenance at Nyandarua Institute of Science and Technology

1.9 Scope of the study

The research was done in Nyandarua institute of science and technology which was purposively sampled among the technical and vocational education and training institutions between May 2018 and October 2019 and focused on cloud record maintenance. The study involved 115 respondents drawn from the institution.

1.10 Limitations of the study

Study experienced challenges especially in data collection which hampered the smooth progression of the process. The challenges included respondents having a very busy schedule with their routine teaching and administrative work and felt inconvenienced. The researcher organized and booked an appointment to allow the respondents to spare some free time to engage in the research.

Record keeping information for the institute are regarded as confidential and classified. The management was reluctant to have such information investigated. The researcher assured them of the confidential treatment of any information that was accessed.

1.11 Definition of Terms

Cloud – is defined as a computer system that applications run on, or as a base of technologies on which other technologies (such as applications) are built.

Platform as a Service (PaaS) – Platform as a Service (PaaS) is a model of cloud in which a vendor provides the hardware and software tools necessary to create, deploy and manage applications at scale to the user via the internet, as a service. For a more in-depth explanation, check out our article.

Record: A record is defined as information or data about an organization, an individual or activity (Lupşe&Tivadar, 2017).Cornwell Management Consultants (2017) define a record as a document generated or given to an individual or entity and maintained by securing it to enhance or promote the activities of the individual or entity.

Maintenance: Practice and measures implemented to ensure record and information are preserved and stored, for easy accessibility, irretrievability, and future use.

Infrastructure: A means by which organizational records can be accessed by different users simultaneously at any time without compromising the efficiency and security of the information stored therein.

Resources – Shared Resources, also known as network resources, are technology resources that can be accessed remotely through a network, such as a Local Area Network (LAN) or the internet.

Disposition: refer to the actions that are associated with decisions about the retention or destruction of records.

Storage – Cloud storage is a model of computer storage in which data is stored in facilities (often multiple facilities) managed by a hosting company (cloud service provider) and is accessed remotely by the user via a network.

Source – Open Source is a development model in which a product's source code is made openly available to the public. Open source products promote collaborative community development and rapid prototyping. Open Stack and Cloud Foundry are examples of an open-source cloud computing platform

Infrastructure as a Service (IaaS) – Infrastructure as a Service (IaaS) is a model in which the vendor hosts virtualized computing resources, as well as network and storage resources, and provides them to the user as a service via the internet.

Network: This is an interconnection of computer hardware and software in an organization.

Network Security: Refers to organizational policies, practices and other measures implemented to hinder and check on any unauthorized access, unauthorized use, loss and modification of a computer network and other network-related resources.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The following chapter concentrates on reviewing past studies on cloud technology and its role in record maintenance. It is arranged in line with the study objectives and contains the summary of the theoretical review, the literature review and the conceptual framework.

2.2 Theoretical review

“A theoretical framework is a structure that can hold a theory of the research work. It presents the theory which explains why the problem under study exists. The theoretical framework is but a theory that serves as a basis for conducting research” (Swanson, 2018). This section presents a review of the theories and models that best explain the knowledge transfer process.

2.2.1 The Communication Model

The communication model by (Shannon & Weaver, 1949) attempted to explicate how knowledge could be transmitted from the sender to the receiver in the fastest and most efficient way. According to business dictionary.com, communication is a two-way process of reaching mutual understanding in which participants not only exchange information, news, ideas, and feelings but also create and share meaning. The model assumes that a message is chosen from a particular knowledge source by the sender. The sender sends the message through a communication channel which means that the message is exposed to noise which can modify the intended message. The receiver collects the message by decoding it and may take action depending on the meaning of the message. Shannon and Weaver detected three limitations to the communication process in the model. The technical problem limits the accuracy of the message being transmitted. The semantic problem limits the accuracy of the received message in contrast with the sender's intention. The effectiveness problem limits the actual action taken by the receiver of the message. The communication model is significant to the study since knowledge transfer is the process of communicating information/knowledge from the source to the receiver. The models point out the different actors, channels of

communication and possible limitations that are involved in the knowledge transfer process.

2.2.2 Structuration Theory

The theory expounds on the connection between organized structures, rules and resources which form what is defined as a social system. The theory states that organizational and individual actions are controlled and facilitated by available structures and rules which are dependent on each other in a duality state of feedback-feed forward process which creates a social cycle which comprises of structure, modality and interaction (Wilkinson & David, 2017).

As a result, technology is used in structuration theory to examine how various parties or persons interact in their daily activities and practices and how such interaction shapes their actions within the organization (Sillitto *et al.*, 2017). They stated further that structuration theory is all about generation and duplication of social systems that connect the structures and the users without giving priority to either but emphasizing on the benefits of each player in the system. Its proponents have adopted and expanded this balanced position. Though the theory has received much criticism, it remains a pillar of contemporary sociological theory.

This theory was applicable in the study because the record maintenance system is composed of rules and resources which make up a complete social system which is dual. The duality nature makes a social cycle characterized by interaction between system users and the system itself, modalities for its functioning and a well-defined structure.

2.2.3 Systems Theory

The proponent of this theory is Ludwing von Bertalanffy in 1928. He said that a system can be broken down into individual components, which interact with others, and that the components could be added linearly to describe the totality of the system. He proposed that one part of the system enables us to know something about another part. A system can be controlled or non- controlled, and in a controlled system information is sensed, and changes are affected in response to the information (Wilkinson & David, 2017). Wilkinson and David (2017) also stated that systems have inherent features that facilitate their functioning as systems irrespective of their size or type.

A system can better be described as a whole made up of parts that are related and act interdependently in a symbiotic manner and with boundaries separating the parts which are at times referred to as subsystems. Further, due to the system of synergy, the output of the system is greater than the output of the individual parts and that malfunction of any part effects or leads to malfunction of the entire system (Niklas, 2018). Proper adjustment of the system with its internal and external environments often leads to better system results in terms of accomplishing the goal for which the system was set for. Any system ought to be flexible to inculcate new and emerging technology which impacts on its operational efficiency as it operates in socio-political and economic as well as cultural environments. James(2017) describes a systems theory as a study of systems science across many disciplines to establish the dynamics of various systems, the challenges they face, the conditions and principles necessary for effective systems that can deliver desired results as well as achievement of optimal conditions in organizations (Wilkinson, 2017). Generally, the systems theory applies broad concepts and principles not necessarily in single but diverse domains of knowledge. The systems in question are not static but dynamic since their parts are interactive and not passive (Checkl &Holwell, 2018).This theory was applicable in the study of record maintenance in cloud technology since the record management system operates as an entity with interrelated and interdependent parts defined by boundaries and it is more than the sum of its parts (subsystem). Change in one part of the record management system affects other parts and the whole system, with predictable patterns of behavior.

2.2.4 The Records Continuum Model

The Records Continuum Model theory was conceived by among others the Records Continuum Research Group, at Monash University in Australia. The Records Continuum Model has as its fundamental principle the record keeping theory and the structuration theory of (Anthony Giddens Upward, 2016). The Record Continuum Model is a theoretical instrument for analyzing records in record keeping systems. The model explains different elements and the phenomena that embrace records. The model handles records from the continuum perspective, which means that (the model expresses the continuing value of records) records never die if they are in use and are useful. The

model conceives of records as logical entities rather than physical entities and takes into consideration the fact that records can be both on paper and in digital form.

According to Upward (1997), the Records Continuum Model is based on four axes, which is called Continuum. They are: identifying, evidence, transaction and record keeping containers. It also consists of four dimensions which are: create, capture, organize and pluralize. The axes are derived from the foundation thinking in archival science. Every axis presents four coordinates that can be linked dimensionally to each other. Upward (2016) and Mckemmish (1998) noted that the records continuum model provides a graphical tool for framing issues about the relationship between records managers and archivists, past present and future, and for thinking strategically about working collaboratively and building partnerships with other stakeholders. Shepherd and Yeo (2003), state that the records continuum concept was developed in response to criticism of the life-cycle model. In a continuum, there are no separate steps. Managing records is seen as a continuous process in which one element of the continuum passes seamlessly into another.

2.3 Review of Literature

The day to day business applications such as electronic mail and those used to create documents online and which can be accessed once the user has a web browser are availed by cloud technology but the software and data are domiciled at the service provider's servers (Niklas, 2018). The Kentucky Enterprise Architecture and Standards Committee (EASC) describe cloud technology as a method of technology in which highly expandable Information Technology-enabled capabilities are provided as a service to many diverse users with Internet Technology. According to some scholars, cloud technology does not necessarily refer to one terminology describing a trend in service delivery but rather the shift of application services into the internet and enhanced application of the internet to utilize many services which were earlier on obtained from the organization's data center (De Borja, 2018). According to Gleick (2017), any organization contemplating cloud technology must, first of all, ensure that all the stakeholders including the vendor have a common understanding of the conditions necessary for an efficient, secure and cost-effective cloud technology because it is maybe a big challenge to establish the record keeping consequences of adopting a cloud

infrastructure without having a clear understanding of the exact nature of the cloud technology. The record life cycle of routinely generated records and transactions that commences from generation, application, maintenance, storage or disposal of records is controlled efficiently and systematically by records management system. Therefore, records management thrives on regular reviews where some records are retained and others disposed of to ensure cost-effective organizational processes that meet legal and regulatory thresholds as well as promote corporate accountability.

Similarly, Shepherd & Yeo (2003), emphasizes that records are very valuable and therefore if complete records are kept from the onset of each transaction, they can save lots of time and financial resources as well as ensure that all the organizational obligations are achieved as well as acting as the point of reference for management decisions. Further, accurate records will ensure fewer wastages and implementation of control mechanisms promptly. The framework for records advanced by The International Standard Organization (ISO15489-1) helps to note regulatory operations of the organization and how to apportion responsibilities for record management. However, The IRMT (2017) explains that records management provides an avenue for achieving economic and efficient creation, maintenance, use and even disposal of records in the organization within the entire records life-cycle and availing information to support decision making and general organizational management (Gleick, 2017).

The ISO 15489 Standard on Records Management (2017) recognizes records management as being the cause of increased efficiency, systematic generation and capture, maintenance, application and disposal of records. It stated further that records management should be described in the context of records life-cycle and its ability to provide evidence and therefore promote effective and efficient corporate governance which is a basis for accountability, safeguard rights and effective utilization of resources (Wilkinson, 2017).

According to Ngulube (2011), a good and effective record management system needs to have specific controls at each stage of the record life-cycle which are aligned with the policy requirements of the organization to promote good governance, increased operational efficiency, economy in executing operations of the organization, easy accessibility of the records, maintenance of the organizations 'memory' to provide

evidence whenever needed and form a basis for future decisions and actions(Kohl, 2017). The Wilkinson (2017), definition focuses on the importance of efficient and economical record keeping and management within the records life-cycle to aid management of the organization, keeping evidence of past events and complying with legal requirements. Quality and competent record maintenance is the only sure way to achieving the organizational mission and vision sine they ensure effective and efficient governance, enhanced accountability to stakeholders, the record supported decision making, well-organized documentation, proof of policies, decisions, transactions, and actions in case of any litigation and generally easy document retrieval. Issa and Wamukoya (2018), explain that improper record management leads to information gaps which cause loss of information crucial in the management of the entity and deprives it of all the benefits accruing from easy, real-time document retrieval.

2.3.1 Cloud Technology

According to Chilundo & Aanestand (2018), cloud technology can be described as a service that is internet-oriented which differ from traditional software since the users can access the said web-based platform using their mobile gadget or the desktop computer which doesn't do the actual computing. The actual computing is dedicated to the data center at the vendor's server. The user obtains the results which are displayed on his or her screen. The access to cloud technology is mainly through the browser such as Microsoft Internet Explorer, Microsoft Edge, Mozilla Firefox, or Google Chrome but in some cases, the cloud technology can be accessed through specialized mobile applications, through a tablet or smart-phone. The user does not require complicated and sophisticated computers to run specialized software (Lynch, 2016).

The basis of cloud technology is the Infrastructure as a Service that offers storage, backup and security services as is the case with Amazon Web Services which offers database, storage, virtual private server, and real-time accessible support services on hourly or megabyte basis. Another type of SaaS platform that is cloud-based is the Voice over Internet Protocol (VoIP) telephone service. The next level of the technology is called the Platform as a Service (PaaS) where the supplier offers a framework and specific functions that users can modify in line with their needs such as the Google App

Engine, Force.com from Sales-force, and Microsoft Azure. Software as a Service (SaaS) is actually an internet-based software service availed on a per-user, per-month basis and is the most commonly used type of cloud service for small office use (Lynch, 2016). Records disposition refers to the actions that are associated with decisions about the retention or destruction of records. The degree to which public management activities are performed depends in part, on the underlying records infrastructure. Where the infrastructure is strong and effective the records management system is underpinned by policy and programs on records disposition (Akotia & Balasu, 2017).

Records disposition refers to the actions that are associated with the decisions about the retention or destruction of records. It also includes migration and transfer of records to new storage locations, custodians or owners. One sure sign that an organization has an effective records management program in place is that it stores and maintains its records securely and efficiently. Cost-effective, secure storage systems that provide quick and rapid retrieval will help ensure the ready availability of records in case of litigation and audits, as well as for future reference use especially when providing services to the public (Ngulube, 2016). If records do not survive for the period that they are required for business or accountability purposes, agencies and the wider government may be exposed to unacceptable levels of risk and potentially costly consequences. If records sustain damage during their period of active use due to poor storage conditions, the government may incur significant expenses to repair items that are subsequently transferred into archival custody. Storing records appropriately for their retention periods is, therefore, a good investment for government institutions. Government institutions should be aware that some of the records they create will have archival value and must be transferred to a public archival institution as soon as they are no longer required for immediate business purposes or identified to contain an enduring value. It is important that government institutions store those records in the best possible conditions while they are still in active use to ensure their long-term preservation. The management and monitoring of records storage services should be undertaken by staff with the relevant skills, knowledge, and level of authority (Kemoni, & Ngulube, 2017).

2.3.2 Cloud Network Accessibility and Record Maintenance

Fiber cable and mobile internet have made it very easy to obtain data from cloud-based technology and have enhanced access to online systems where due to good connectivity the customers are able to download data for use wherever they are. The available technology also serve numerous requests simultaneously and allows integration of many different systems such as Human Resource Information systems (HRIS) and Electronic Medical Records (EMRs) where senior health managers have learned to obtain data for themselves and personally evaluate data quality. The tremendous growth in information technology can be attributed to the emergence of cloud computing technology where applications are delivered as internet-based services and the hardware as well as systems found in respective data centers that provide the services. Therefore, as described by the (Greengard, 2018) the National Institute of Standards and Technology cloud is a model for convenient, real-time access to customize and editable resources such as networks, servers, storage, applications, and services that can be accessed and provided with very little management effort. That feature has made cloud very preferable to both public and private sector organizations where resources in cloud technology are pooled and shared among many parties in a cost-effective and efficient manner and payment is only for the usage without spending on hardware.

2.3.3 Cloud Cost Effectiveness and Record Maintenance

Organizations are fast realizing that money can be saved through the use of these individuals instead of employing a full-time staff. By cloud services, management can ensure that contractors have the ability to use the correct software from wherever their office may be. Even taking into account full-time or part-time employees, the ability to work from home due to illness, dependents or other circumstances can keep an Institution going strong. A marketing Institution that never has the need to rent an office space, pay for air conditioning, or any of the other costs in maintaining an office. Cloud file sharing works when a file is stored on an online or cloud file-sharing service. The file is uploaded using the service control panel and upon successful upload, the file is generated with a unique URL (Kemoni &Ngulube, 2017).

File owners can share this URL with multiple users for accessing and downloading the file. The file is stored on the file-sharing provider's cloud storage servers and can be

accessed globally at any time through the Internet. Organizations seek to minimize the cost of storing and processing their data so they transfer all their data and information to cloud-based technology after gaining the trust of the cloud service vendor and provider who is able to put in place data safeguards for data security in cloud technology. However, a number of challenges make these attempts futile since more work still needs to be done to make users accept the cloud services. The asset which the organizations are more concerned about apart from money savings is the data that is stored in the cloud which they share by putting it either directly in the relational database or eventually in a relational database through an application. The trust by the users on the cloud technology is based on the ability of the vendor to provide data protection and prevention measures. Despite the efforts of testing various tools and techniques for data protection, there are still shortcomings that require attention to enhance the process of sharing cloud computer-based files among many users at minimum cost (Lynch, 2016).

2.3.4 Shared Cloud Infrastructure and Record Maintenance

Cloud file sharing refers to a range of cloud services that allow people to store and synchronize documents, photos, videos and other files in the cloud and share them with other people. These services also allow users to share and synchronize data among multiple devices for a single owner. These services are accessible through desktops, notebooks, smart phones, and media tablets, and provide a simple mechanism for synchronizing data across multiple devices. Cloud based technology enables user organizations to make use of IT services more than before and ensure rapid service delivery as a result of the ability to generate, customize, transfer and retrieve data more quickly than ever (Gibson & Eppler, 2017).

The customer retention capability is enhanced, marketing time is shortened and horizontal market expansion is achieved with ease not forgetting the fact that Information Technology optimization is promoted for cost-benefit IT resource configuration. Further Gibson & Eppler, (2017) noted that cloud technology promotes massive scalability aimed at meeting demands while avoiding long periods of underutilized IT capacity. With the click of a mouse, services can be quickly expanded or contracted without requiring overhauls to the core data center. Cloud technology will enable services to be consumed easily on demand. Cloud technology has characteristics such as on-demand self-service,

ubiquitous network access, location independent resource pooling, rapid resource elasticity, usage-based pricing, and transference of risk. These merits of cloud technology have attracted substantial interests from both the industrial world and the academic research world. Cloud technology is currently changing the way to do business in the world (Kambil, 2017).

Cloud technology is very promising for IT applications; however, there are still some problems to be solved for personal users and enterprises to store data and deploy applications in the cloud environment. One of the most significant barriers to cloud technology is data security, which is accompanied by issues including compliance, privacy, trust, and legal matters. In the cloud environment, consumers of cloud services do not need anything and they can get access to their data and finish their tasks just through Internet connectivity. During the access to the data, the clients do not even know where the data are stored and which machines execute the tasks.

2.3.5 Cloud Network Security and Record Maintenance

Organizations pay a premium for security, something that cloud services supply at varying levels depending on the provider. Since security is especially important, it may be prudent to conduct proper research to be positive that a cloud service provider is legitimately protecting information. If an Institution decides to add another layer of security on its end, that is just more security for the Institution. There is debate as to whether or not cloud services provide more or less secure than traditional IT infrastructure. Some argue that data is more secure when managed internally, while others argue that cloud providers have a strong incentive to maintain trust and as such employ a higher level of security. For agencies considering deploying cloud technology services, it will be important to address these issues and others like them upfront. Have the provider demonstrate or describe in detail how they can meet all agency requirements, and clearly delineate those requirements in the contract with the provider. Over the years, data security has been an issue of concern especially in cloud technology environments where data is scattered in different and storage devices including servers, PCs, and various mobile devices such as wireless sensor networks and smart phones. Data security in the cloud system is not as complicated as data security in traditional information systems (Chilundo & Aanestad, 2018).

The individual users and enterprises require that before adopting any cloud technology, there is a need to address the security concerns and have them corrected to increase their confidence in its usage. To win the user confidence can only be achieved if the operating environment is secure and can be trusted. Many scholars envisage that cloud technology will be the next technological advancement that the next generations will adopt since all the applications and resources are delivered on a real-time basis over the web which is cost-effective and efficient (Kaur & Ateriya, 2017). Due to the high demand of users and access points inherent in a cloud technology, it is important to ensure the authorization of only relevant parties to access the data. Authorized access is one way of ensuring users have confidence in the integrity of the contained data. It is essential to establish and determine who can access and alter any data held in the cloud. Therefore, a good mechanism for monitoring and keeping trail of the activities is crucial so that data integrity is not compromised. Also, there is a need to trust cloud vendors and providers as one way of ensuring integrity and accuracy of data but it is necessary to institute a check-mechanism from a third party apart from users and cloud service providers. Finally, it is important to remotely verify the data integrity and as (De Borja, 2017) proposed there has to be proof of irretrievability to achieve checking of data integrity by connecting error correction code and spot-checking.

There is a risk of a breach of privacy and other laws if the risk of unauthorized access to the cloud-based data is not managed. The risk increases especially when there is sub-contracting of some of the operations of the organization which may lead to co-location of records and data with other organizations. Therefore, there is a need to ensure proper partitioning and instituting proper security measures. Again, periods of interruption to cloud-based services because they rely on internet connectivity may make records and data to be inaccessible for some time. That can affect business where continuous access is mandatory and any interrupted access may lead to severe losses (Greengard, 2018).

Lastly, there is a risk of records and data not being disposed of in a timely manner after authorization by the users. Such records may be replicated and sent to unauthorized places and persons. Therefore, if time-expired records are not well and effectively destroyed from all servers in all sites, then there is a big risk especially in cases of data containing personal or proprietary information (Lynch, 2016).

2.4 Conceptual Framework

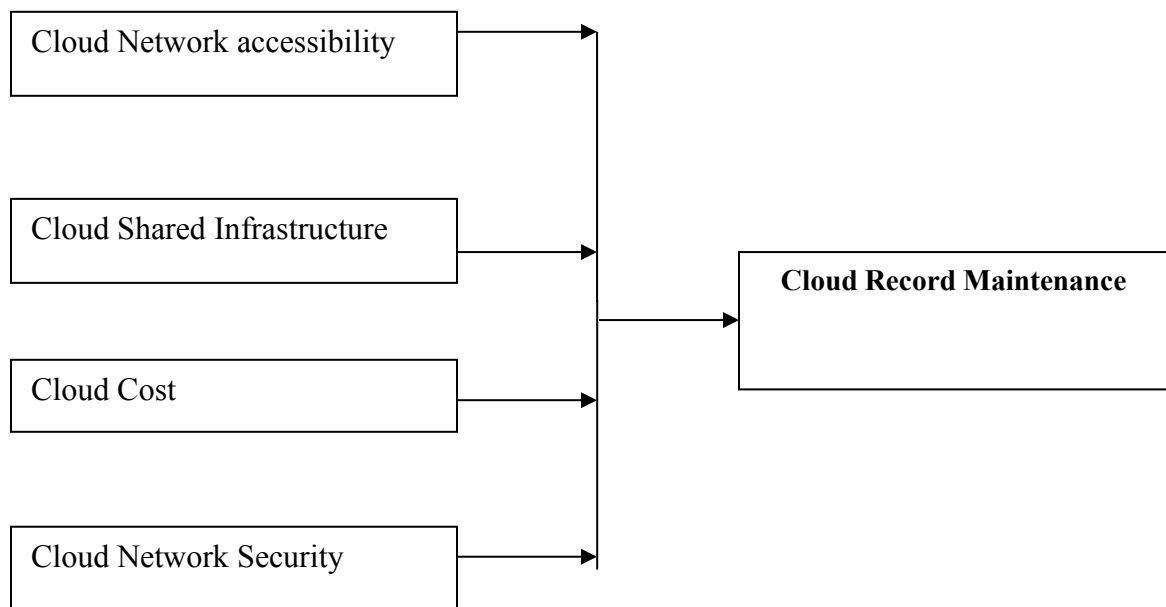
A conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. Strong conceptual frameworks capture something real and do this in a way that is easy to remember and apply. Bowen (2018) defines the conceptual framework as a set of broad ideas taken from relevant fields of inquiry, intended to assist a researcher to develop awareness and understanding of the situation under scrutiny and to communicate. It also aims to assist the researcher to organize her/his thinking and explain the relationship between interlinked concepts.

Figure 2.1

Conceptual Framework

Independent Variables

Dependent Variable



The independent variable is the variable that you have control over and that which impacts or manipulates the dependent variable. The independent variable represents the inputs and causes. In this study, the independent variables are significant intrinsic and extrinsic factors that will potentially influence the dependent variable. They include; network accessibility, cost-effectiveness, shared infrastructure and network security which will be manipulated to influence the dependent variable. The dependent variable is

the result of the independent variable being manipulated. The dependent variable represents the impact, outcome, output, effect or consequences of the study. For this study, the dependent variable is the cloud record maintenance.

Table 2.1***Operationalization of the Variables***

Variable Type	Variable	Operationalization	Measurement
Dependent	Cloud Record Maintenance	E-mails records	-E-mail communications -Online transactions -Electronic tendering -Electronic records
Independent	Network accessibility	Use of passwords	-Ease of accessing records with valid authorization
	Cost effectiveness	-Implementation cost -Maintenance cost	-Manual and electronic costs compared -Frequency of system maintenance
	Shared infrastructure	- File transfers - File sharing	-System interconnectivity
	System security	- Unauthorized access cases	-Physical security measures -Use of passwords

Source: (Author, 2019).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter three study's the research methodology, research design, determination of target population, sampling procedure and sample size, data collection methods, instrument validity and reliability, techniques for data processing.

3.2 Research Design

According to Mugenda and Mugenda (2017), the research design is the outline plan or scheme that will be used to generate answers to the research problems. It is the overall structure and plan of investigation. Lavkaras (2008) describes a research design as a general plan or strategy for conducting a research study to examine specific testable research questions of interest. Finally, a descriptive research design is the blueprint for the collection, measurement, and analysis of data. It is a plan and structure of investment conceived to obtain answers to research questions (Cooper & Schindler, 2017). The most common research designs include a causal design which is used to measure what impact a specific change will have on existing norms and assumptions (Mugenda & Mugenda, 2003). The mixed-methods approach involves combining qualitative and quantitative research and data in a research study. It was the most suitable approach for this study, based on the fact that collecting diverse types of data best provides a more complete understanding of a research problem, and neutralizes the bias and weaknesses of either quantitative or qualitative alone (Creswell & Creswell, 2017). Quantitative research is used to quantify the problem by way of generating numerical data. The quantitative approach is justified because it enabled the researcher to measure the various variables in this study.

According to Amaratunga *et al.*, (2002), the reliability and validity of the quantitative data will be determined more objectively because the collected data will not be inferred subjectively through sensation or intuition. Further, it enabled the researcher to numerically demonstrate the different trends, attitudes, and opinions of the participants relating to the research questions. It employed structured questions in the interviews and presented the analyzed data in numeric form through the use of tables, charts or figures.

The qualitative approach utilized semi-structured questions to collect in-depth information in the interviews and presented the analyzed data in the form of statements and phrases. Due to the emphasis on real-life experience, qualitative data is well suited for explaining the meaning participants place on the processes under study. The rich data that is provided through the qualitative approach enabled this study in presenting vivid descriptions nested in a real-life context. According to Amaratunga *et al.*, (2002), the qualitative approach has been advocated as the best strategy for discovery or exploring a new area. Further, qualitative data are useful when one needs to supplement or validate quantitative data from the same setting. This approach examined the effect of network accessibility on record maintenance, established the effect of cost of cloud, examined the effect of shared infrastructure and determined the effect of network security on record maintenance in the Nyandarua Institute of Science and Technology.

This study triangulated both the qualitative and quantitative data to provide a comprehensive and rich analysis of the data. Triangulation enables the researcher to check and compare types of data, expound or generate analysis that gives more information and therefore acts as a source of new knowledge (Amaratunga *et al.*, 2002). The interpretation of the overall results was used to draw conclusions and inferences on whether or not the research questions were supported.

3.3 Target Population

Population is an entire group of individuals, events or objects having common or observable features Mugenda and Mugenda (2004) defines the target population as the total collection of elements about which the researcher wishes to make some inferences. The target population contains members of a group that a researcher is interested in studying and the results of the study are generalized to this population because they all have significant traits in common (Coopers & Schindler, 2017). According to Kombo and Tromp (2009), the target population for a survey is the entire set of units for which the survey data are to be used to make inferences. Thus, the target population defines those units for which the findings of the survey are meant to generalize.

The target population of the study consisted of teaching staff who keep student records of performance, the records officer is in charge of the institution archives, the heads of department keep all departmental records including those of students and lecturers, the

principal and the deputy keep all the administrative institutions records, the registrar maintains academic records of all the students, the finance officer maintains the financial records of the institution, procurement records including tenders and stock records are maintained by the procurement officer while the quality assurance officer maintains important records of procurement activities. The total target population of the study was 125 members of staff of Nyandarua Institute of Science and Technology which was randomly picked out of the TVET institutions in Kenya because of the homogeneity of such institutions. TVET institutions are uniform in terms of record keeping and maintenance. The results of the study are generalized to this population because they all have significant traits in common (Mugenda & Mugenda, 2017).

Table 3. 1

Target Population

Category	Frequency
Teaching Staff (Lecturers)	111
Records office	1
Heads of departments	7
Principal	1
Deputy Principal	1
Registrar	1
Finance officer	1
Procurement officer	1
Quality Officer	1
Total	115

Source: Nyandarua Institute of Science and Technology Records (2018).

The target population manages the institution's records as follows;

Teaching Staff (Lecturers) creates and maintains students' class registers and attendance, and transcripts which contain the student's performances on assignments and

examinations. Records officer preserves the institution records which have been audited and appraised and found to have permanent value for future use and reference. Heads of departments determine which records will be created, gathered, and maintained and produce records for audit and performances of the institution's core activities. The principal maintains, secures and provides care for the institution records in accordance with the institution's record management program.

Deputy Principal maintains, secures and provides care for the institution academic records in accordance with the institution's record management program. The finance officer preserves records that have financial and evidential value of the institution's transactions and student fees reports. The procurement officer maintains, secures and provides care for tender documents and purchase records of the institution's properties, and facilities and the Quality Officer ensures that the administrative records are appropriately managed, preserved, secured, and can be retrieved as needed.

3.4 Sample and Sampling Technique

A sample is a subset of the population and should be a typical representation of the larger group. Depending upon the size and type of the population and the type of study, different methods are available to help identify a fair sample, such as random sampling which this study adopted. A sample is the number of items selected to represent the whole population (Kothari, 2004). Cooper and Emory (1995) on the other hand, define sample size as the subject on which the measurement is being taken as the unit of study. Sampling design is a method of selecting items to be observed for the given study (Kothari, 2004). Mugenda and Mugenda (2003) stated that there are two main types of sampling namely probability and non-probability sampling and the difference between the two types is whether or not the sampling selection involves randomization.

Randomization occurs when all members of the sampling frame have an equal opportunity of being selected for the study. Mugenda and Mugenda (2003) further state that probability sampling uses randomization and takes steps to ensure all members of a population have a chance of being selected whereas non-probability sampling does not rely on the use of randomization techniques to select members. Probability sampling techniques include random sampling where everyone in the entire target population has an equal chance of being selected and Stratified Sampling where the researcher identifies

the different types of people that make up the target population and works out the proportions needed for the sample to be representative (Kothari, 2004). The researcher used a census of all the teaching staff, HODs and the administrative staff that added up to 125 respondents. The 7 heads of departments were purposively sampled because they keep departmental records and were therefore capable of providing valid responses on cloud record maintenance.

3.5 Data Collection Methods

Information that went into the writing of this study was gathered through primary and secondary data collection methods. The primary research was conducted through the use of face to face interviews. The study proceeded to use secondary research to collect data. This was done through an in-depth study of books, journals, and articles written by scholars on past and present factors affecting cloud technology. The following is the data collection method that was used for this study:

3.5.1 Interviews

An interview is the verbal conversation between two or more people with the objective of collecting relevant information for the purpose of research (Kothari, 2017). There are two types of interviews: structured and unstructured interviews. Structured interviews are those where the questions and the answer categories have been predetermined by the interviewer, whereas, unstructured interviews neither the questions nor the answer categories are predetermined (Gorman & Clayton, 2005). This study used semi-structured interviews, and the list of questions to be covered was derived from the objectives and research questions.

Semi-structured interviews were well suited for this study due to the following advantages of using them as data collection instruments. In cases of misunderstandings, the researcher can clarify or explain the questions by repeating or rephrasing them. It can be used as a guide or starting point to allow the respondent to express their opinions on a wide range of issues as they respond to questions, unlike other data collection methods. The researcher can explore additional questions to fulfill the research objectives. Face to face interviews also has a large number of potential advantages for qualitative data. Face to face interviews allow the researcher to receive an immediate response to their questions, unlike sent questionnaires which may result in delays in the data collection

process. Both the researcher and respondent can explore the meaning of the questions to ensure proper understanding, and clarify the answers to resolve any ambiguities. It allows the researcher to explore the cause and effect of an event, that is, to examine why individuals or organizations behave the way that they do.

Face to face interviews provides personal contact between both parties, thereby creating a friendly and more personal touch on the data collection process. The speed at which a large quantity of rich data is collected during face to face interviews is improved. Face to face interviews was used to collect data from all the respondents in the census inquiry of this study. The quantitative data were collected by asking closed-ended questions followed by open-ended questions in the semi-structured interview.

The researcher used questionnaires as the data collection instrument since the research was quantitative. The questionnaire was subjected to reliability and validity test. Mugenda & Mugenda (2003) stated that a research instrument is reliable if it gives similar results after several tests. Kothari, (2004) states that a research instrument has validity if it measures what it is purposed to measure. According to Mugenda & Mugenda, (2003) reliability refers to consistency or stability of measurement of a research instrument. A test is reliable to the extent that whatever it measures, it measures it consistently. There are three major categories of reliability for most instruments; test-retest, equivalent form, and internal consistency where each measures consistency a bit differently and a given instrument need not meet the requirements of each. Test-retest measures consistency from one time to the next. Equivalent-form measures consistency between two versions of an instrument. Internal-consistency measures consistency within the instrument that is, consistency among the questions.

3.6 Reliability and Validity of the Research Instruments

Testing for reliability and validity is a complex task but significant in reducing the likelihood of getting the wrong results. Reliability is a measure of the degree to which a research instrument would yield the same results or data after repeated trials (Creswell& Creswell, 2017). Validity refers to the suitability or meaningfulness of the measurement. It is the extent to which an instrument measures what it purports to measure (Mugenda & Mugenda, 2003). Validity requires that an instrument is reliable, but an instrument can be

reliable without being valid. The researcher will test content validity through the expert judgment of the supervisor. This type of validity addresses how well the items developed to operationalize a construct, provide an adequate and representative sample of all the items that might measure the construct of interest. Construct validity will also be tested. Construct validity is a judgment based on the accumulation of evidence from numerous studies using a specific measuring instrument (Kothari, 2004).

3.6.1 Pilot Study

Pilot testing is very significant to scientific research, and studies that neglect it runs the risk of collecting useless data. A pilot study entails carrying out a preliminary test of data collection instruments to make revisions to the instruments to guarantee that suitable questions are asked, the accurate data will be collected, and the data collection methods will function. The pilot was conducted at Nyeri Technical Institute by administering questionnaires to 10 respondents. The Cronbach's alpha coefficients were obtained from the SPSS Version 25.0 to determine the internal consistency of the questionnaire in measuring the cost-effectiveness, data security, shared infrastructure and network accessibility of the cloud technology. The variable on network accessibility had a Cronbach's alpha score of 0.809, cost of cloud with an alpha score of 0.788, shared infrastructure with a score of 0.756 while network security had a Cronbach's alpha score of 0.788.

3.7 Data Analysis

Data collected was compiled, sorted, edited, classified and coded in readiness for analysis using the SPSS software. The relationship between variables was established through correlation analysis. The regression analysis and ANOVA were used to test the maintenance of records at the Nyandarua Institute of Science and Technology. The dependent variable was cloud record maintenance (Y), the four variables were Network accessibility (NA), Cost-effectiveness (CE), Shared infrastructure (SI) and System Security (SS). The relationship between the dependent and independent variables will be expressed as $Y = + NA + CE + SI + SS$. Descriptive analysis was done by the use of frequency distributions and means as measured by percentages and presented in the form of tables and pie-charts. The interview schedule was subjected to content analysis to

extract information from the responses, and the interview schedule was given to the seven heads of departments.

3.8 Ethical consideration

The researcher obtained an introduction letter from Kenya Methodist University and a Government permits which was submitted to the authorities to let them know of the study in Nyandarua Institute of Science and Technology. A friendly atmosphere was created with the respondents, an explanation of the kind of information needed to be given as well as how the information was used. This was done by explaining the aim of the research and the importance to the institution and the Kenyans at large. Mugenda and Mugenda (2003), state that it is unethical to hide the findings of any research from the concerned parties. The researcher ensured confidentiality of all the information provided by the respondents by maintaining anonymity and using the data collected purely for academic purposes.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

The study adopted different statistical approaches to examine cloud record maintenance in Technical and Vocational Education Training Institutions. Other than the descriptive statistics, the reliability test of the research instrument was done by using the Cronbach's alpha coefficients which were generated using the SPSS software.

4.2 Response Rate

Data were collected from employees of the Nyandarua Institute of Science and Technology. The sample of 125 respondents was used of which 115 questionnaires were received duly filled and used for analysis. The responses received formed a 92% response rate as shown in table 4.1.

Table 4.1

Response Rate

Category	Frequency	Percentage (%)
Response	115	92
Non response	10	8
TOTAL	125	100

4.3 Highest Level of Education

The highest level of education was another aspect which the study sought to establish among the respondents and as shown in table 4.2, (50%) had up to tertiary college level of education, (36%) were university graduates and (14%) had up to the secondary level of education. None of the employees had only a primary school level of education implying that the respondents had sufficient knowledge and educational background that was considered useful for this study. The findings based on their education level showed that the respondents had an adequate understanding of challenges of record maintenance in Technical, vocational and Educational training institutions.

Table 4. 2***Distribution of Respondents by Highest Level of Education***

Level of Education	Frequency	Percentage (%)
Primary	0	0
Secondary	0	0
Tertiary College	73	64
University	42	36
Total	115	100

4.4 Cloud Network Accessibility and Record Maintenance

The respondents' opinion on the effect of network accessibility on record maintenance at Nyandarua Institute of Science and Technology was sought. The variables that were considered for network accessibility in this study included; use of manual records, accessibility of manual records and record maintenance in cloud. The study sought to determine if the Institutions promoted the use of cloud technology which was a determinant to effective record maintenance. The respondents were required to indicate their opinion by choosing the following; Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree.

The study sought to determine whether the Nyandarua Institute of Science and Technology maintained manual records. The majority of the respondents (58%) agreed while (42%) strongly agreed. None of the respondents disagreed implying that the institutions maintained manual records. The Institution's emphasis on making records easily accessible was realized since when they were asked if manual records were easily accessible. The majority of the respondents 56% disagreed, 40% strongly disagreed, 3% were neutral and only 1% disagreed. These findings implied that the Institution encouraged employees to maintain electronic records since they were not easy to access by unauthorized persons. The aspect of whether the institution's records were maintained in the cloud was tested and many of the respondents at 49% agreed, 39% strongly agreed, 7% were neutral and 5% disagreed with the statement. Therefore, these results implied that Nyandarua Institute of Science and Technology records in cloud technology. The study sought to establish whether electronic records were more accessible as opposed to manual records. The majority of the respondents 54% strongly agreed and 46% agreed.

The findings implied that the Nyandarua Institute of Science and Technology emphasized on cloud technology in the maintenance of its records.

Table 4.3

Respondents' opinion on network accessibility

NETWORK ACCESSIBILITY	%	Respondents Opinion				
		SA	A	N	D	SD
Nyandarua Institute maintains manual records	%	42	58	0	0	0
Manual records are not easily accessible	%	40	56	3	1	0
Electronic records are not easily accessible to unauthorized persons	%	39	49	7	5	0
Most records for the institution are kept in cloud technology	%	58	40	2	0	0
It is easier to access electronic than manual records	%	54	46	0	0	0
Cloud technology enhances records accessibility	%	22	37	12	8	21

4.5 Cloud Cost Effectiveness and Record Maintenance

On the effect of cloud and cost-effectiveness, the study sought to investigate whether Nyandarua Institute of Science and Technology incurred a cost in record maintenance and 40% strongly agreed, 33% agreed while 14% strongly disagreed and 12% disagreed. Only 1% was neutral. As to whether the institution found it costly to maintain manual records as compared to electronic records, 51% agreed, 48% strongly while only 1% strongly disagreed. Further, on whether the electronic record system was initially costly but cheap in the long-run, 47% agreed, 35% strongly agreed, 10% strongly disagreed and 6% agreed. Only 2% were neutral.

On whether loss of records can have a major impact on the institutions in terms of cost of recovery it was established from the findings that 65% of the respondents agreed, 25% strongly agreed, 5% strongly disagreed and 4% disagreed while only 1% was neutral.

Finally, the respondents were asked to state whether record maintenance in the cloud technology was comparatively cheaper they responded by 65% who agreed, 25% strongly agreed, 5% strongly disagreed, 4% disagreed and only 1% was neutral.

Table 4.4

Cloud Cost Effectiveness and Record Management

Cost effectiveness	SA	A	N	D	SD
	%	%	%	%	%
Maintaining the institutions records has a cost implication.	40	33	1	12	14
Manual records are more costly to maintain.	48	50	0	0	2
Electronic record system is initially costly but cheap in the long run	47	35	2	6	10
The loss of records can have major impact on the institution in terms of costs of recovery.	25	65	1	4	5
Record maintenance in cloud is comparatively cheap.	33	38	2	14	13

4.6 Shared Cloud Infrastructure on Record Maintenance

Regarding the effect of shared infrastructure on record maintenance, the researcher sought to establish whether the Institution achieved real-time record accessibility, simultaneous record sharing and reproduction of records in cloud form and backup of cloud-based records. The respondents were required to indicate their opinion by choosing the following; Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree.

Table 4.5

Cloud Network Security

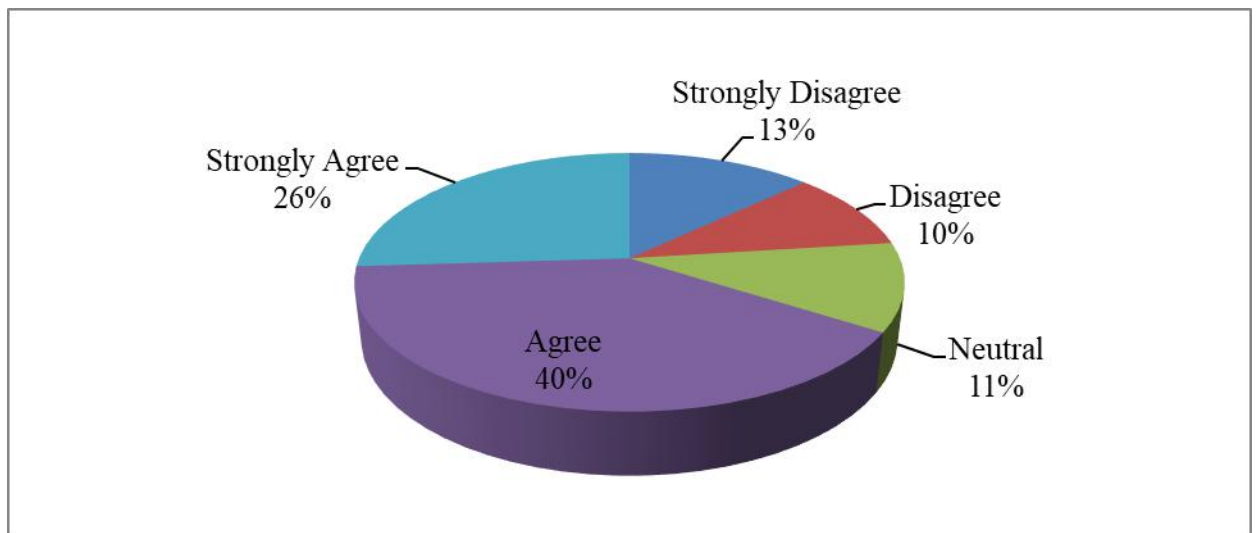
NETWORK SECURITY	SA	A	N	D	SD
	%	%	%	%	%
Manual records are not secure since they can be accessed by unauthorized persons.	55	45	0	0	0
Electronic records require authorization to access and are therefore comparatively secure.	33	43	13	11	0
Records in cloud are highly secure and cannot be lost easily.	44	47	9	0	0

It is comparatively easy to maintain records in a cloud.	40	37	7	14	2
Records in cloud are easy to maintain for future use.	55	40	5	0	0
It is mandatory for all Institutions to keep their records secure	57	43	0	0	0

Figure 4.1

Real-Time Record Accessibility

4.7 Real-Time Cloud Record Accessibility



Real-time record accessibility facilitates speedy decision making and enhanced service delivery by accessing the required information within a short time. As Chilundo&Aanestad (2018) established, timely access to records facilitated quality service delivery. Regarding the aspect of whether cloud technology facilitated real-time accessibility of institutions of records, the majority of the respondents at 40% agreed, 26% strongly agreed, 11% were neutral, 13% strongly disagreed and 10% disagreed as shown in figure 4.8. The results were also in line with the findings of Kaur & Ateriya (2017) who established that it is essential to for any entity be it private or public to document all its activities in the form of records which act as memory for the organization and that such records should preferably be in reproducible formats which users can access within reasonable timelines as long as they have the prerequisite access credentials to further enhance organizations management.

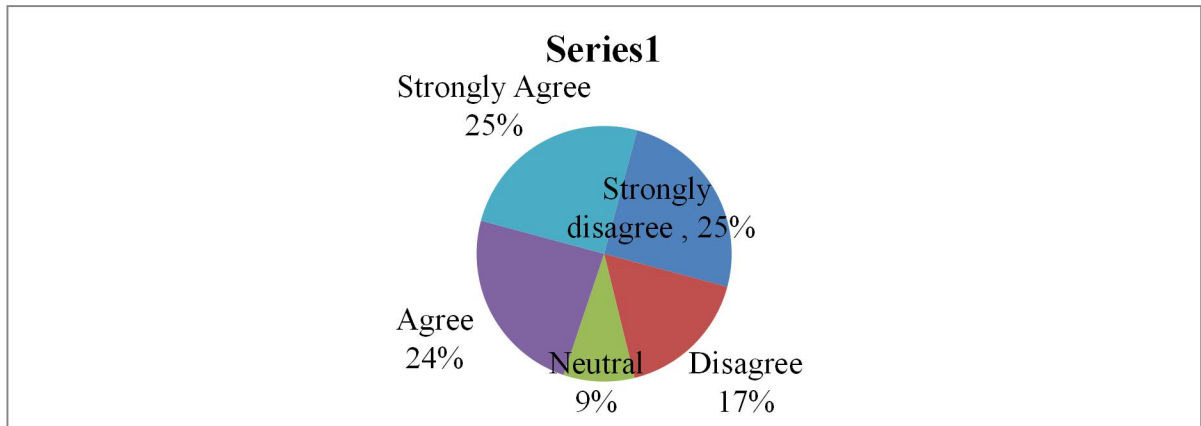
Similarly, Greengard (2018) stated that cloud technology is a model for convenient, real-time access to customized and editable resources such as networks, servers, storage, applications, and services that can be accessed and provided with very little management effort. That feature has made cloud technology very preferable to both public and private sector organizations where resources in cloud technology are pooled and shared among many parties cost-effectively and efficiently and payment is only for the usage without spending on hardware.

4.7.2 Simultaneous Record Sharing

Another aspect the study sought to determine was whether cloud technology enabled users to share records with various other users simultaneously. The findings as indicated in figure 4.7 showed diverse responses on the sharing of records since 25% strongly agreed, 24% agreed, 25% strongly disagreed with 17% disagreeing with the statement and 9% were neutral. These results were similar to the sentiments of Armbrust, (2018) who stated that a record is information stored in a form that allows further duplication and storage in diverse user-friendly formats which are meant to initiate and enhance business day to day activities of an organization. Such records may be kept to meet legal requirements and organizational policy. Further, Joshua and Ogwueleka, (2018) noted that relevant information ensures certainty in the decision-making process and certainty of the decisions themselves and as such information should flow throughout the organization for easy tapping at the point of need. Such can only be achieved if there is a good, efficient, effective record management system. Therefore, cloud technology facilitates simultaneous use and sharing of organizational records which makes it easier for such records to be maintained.

Figure 4.2

Record Sharing

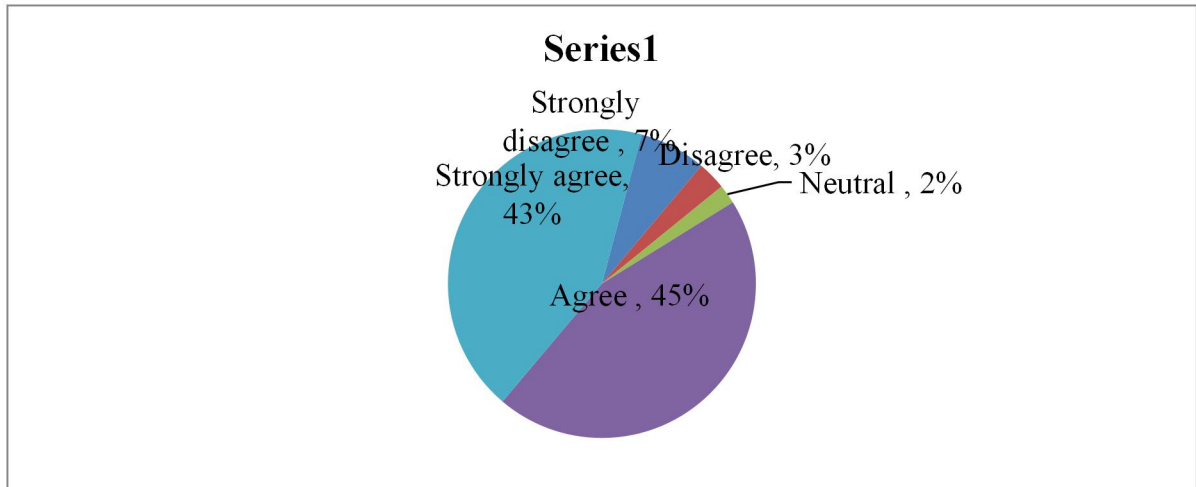


4.7.3 Cloud Record Sharing and Record Maintenance

The aspect of being able to share records among users across different geographical regions using cloud technology and 45% agreed, 43% strongly agreed, 7% strongly disagreed and 3% disagreed. Only 2% were neutral. These findings shown in figure 4.10 implied that cloud technology enabled users in different geographical regions within and outside the institution to share records with ease. These findings were in agreement with Armbrust, (2018) who established that cloud technology facilitated inter-unit communications by adequately sharing information.

Figure 4.3

Cloud technology and Record Sharing

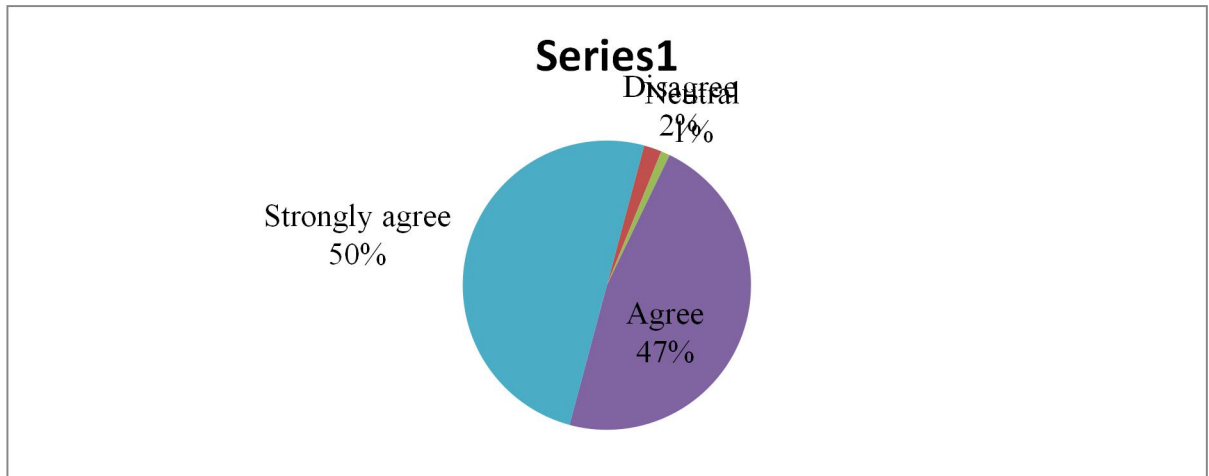


4.7.4 Reproduction of Cloud-based Records

The study sought to determine whether the records in the cloud were easy and cheap to reproduce to multiple users. The majority of the respondents at 50% strongly agreed with the statement, 47% agreed, 2% disagreed and only 1% was neutral as shown in figure 4.4

Figure 4.4

Reproduction of Cloud-based Records

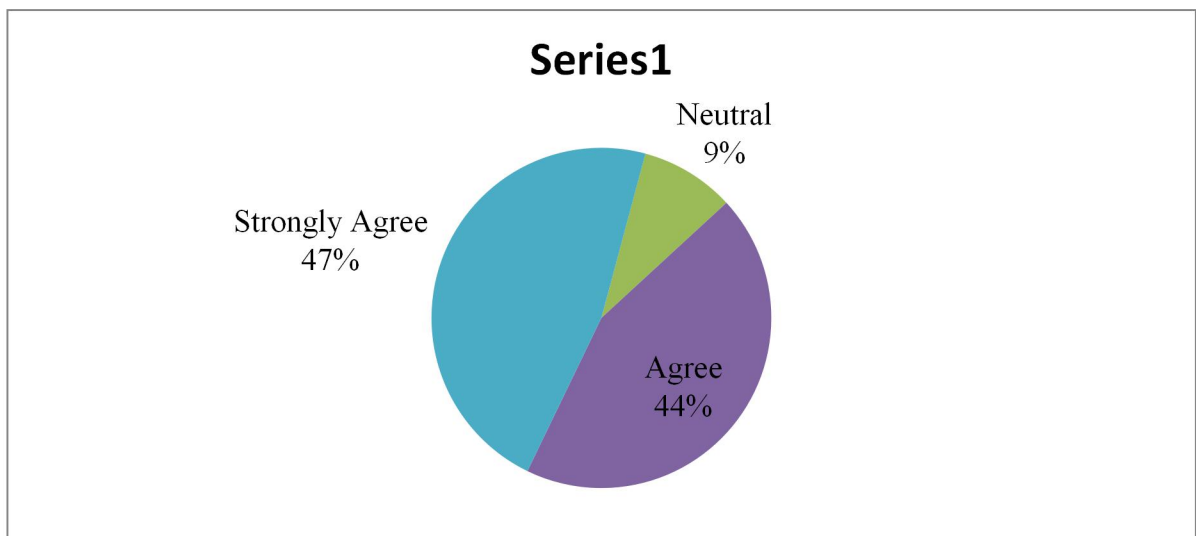


4.7.5 Back-up of Records

The other aspect which the study sought to determine was whether the records in the cloud were easily shareable and maintainable due to available back-up in different locations within and outside the institution. The majority of the respondents as shown in figure 4.12 strongly agreed at 47%, while those who agreed comprised 44% of the total. Only 9% were neutral. The findings were in agreement with those of Lynch (2016) who concluded that the basis of cloud technology is the Infrastructure as a service that offers storage, backup and security services.

Figure4.5

Back-up of Records



4.8 Cloud Network Security

The researcher sought the respondents' opinion on various aspects related to network security such as security of manual versus electronic records, the requirement of authorization to access electronic records, level of security of electronic records and ease of maintenance of cloud-based records. When they were asked whether manual record maintenance was relatively easy, 55% of the respondents strongly disagreed while 45% disagreed. They were further asked whether electronic records access required authorization and they responded as shown in table 4.8 whereby 43% agreed, 33% strongly, 13% were neutral and 11% disagreed with the statement. The study further sought to determine whether the cloud-based records were highly secure as compared to manual records and 47% agreed while 44% strongly agreed. Only 9% were neutral. Further, it was sought if electronic records were comparatively easy to maintain in the cloud and 40% strongly agreed. These results were in agreement with those of Chilundo & Aanestad (2018) who established that data security in the cloud not as complicated as data security in the traditional information systems and that the individual users and enterprises just before adopting cloud, need to address the security concerns and have

them corrected to increase their confidence on its usage and also to win user confidence which can only be achieved if the operating environment is secure and can be trusted.

4.9 Inferential Statistics

The inferential statistics were done on the data through the analysis of variance (ANOVA) to determine the goodness of fit of the model, the correlation between variables as well as the multiple regression models which is presented in this section.

4.9.1 Analysis of Variance (ANOVA) for Network Accessibility on Record Maintenance

The ANOVA results in table 4.6 indicate that the model was appropriate for this data since F –Value was 40.037 and the p-value of 0.000 was less than p-critical of 0.05 implying a significantly positive relationship between network accessibility and record maintenance. Therefore, network accessibility has a statistically significant positive effect on record maintenance.

Table 4.6

Analysis of variance (ANOVA) for Network accessibility

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	1039.522	1	1039.522	40.307	.000 ^a
	Residual	2448.055	114	21.47		
	Total	3487.577	115			

Predictors: (Constant), Network Accessibility

The results in table 4.7 further indicated a significant positive effect of Network accessibility on record maintenance. The fitted model $Y=7.951+0.464X_1$. These findings implied that a unit change in X_1 will increase record maintenance by 0.464 units and that in the absence of Network accessibility, the record maintenance will still be positive at 7.951 since other factors affect the record maintenance such as cloud shared infrastructure and network security.

Table 4. 7:

Regression Coefficient of the Relationship between Network Accessibility and Record Maintenance

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
	B		Beta		
(Constant)	7.951	1.710		4.649	0.007
Network Accessibility	.566	0.076	0.303	7.447	0.000

Dependent variable: Record Maintenance

4.9.2 Regression model of Network accessibility on Record maintenance

Regression analysis was carried out to determine the amount of variation in record maintenance explained by network accessibility. The calculated R-value was 0.57. The R square was equal to 0.325 while the adjusted R square was 0.323 which means that 32.3% of the corresponding variation in record maintenance can be explained by the change in network accessibility.

The rest 67.7% was attributable to other factors not in the model. The Pearson correlation coefficient r was 0.57 with a p-value of 0.00 which was less than 0.05. Therefore, the correlation coefficient of 0.57 implied a significant positive relationship between network accessibility and record maintenance. The results were as presented in Table 4.8.

Table 4. 8:***Correlations of Network accessibility and Record maintenance***

		Correlation	
Record maintenance			Network accessibility
Network accessibility	Pearson Correlation	.57**	1
	Sig (2-tailed)	.000	.000
N		115	
R		0.57	
R Square		0.325	
Adjusted R square		0.323	
Std. Error of the estimate		1.5792	

** means significant at 5%.

4.9.3 Analysis of variance (ANOVA) for Cost of Cloud Record Maintenance

The ANOVA results in table 4.9 indicate that model fit was appropriate for this data with an F-value of 29.59 since the p-value of 0.000 was less than p-critical of 0.05 implying that the model is significant in predicting record maintenance in Nyandarua Institute of Science and technology. Hence, this study confirms that indeed the cost of cloud has a significant effect on record maintenance in Nyandarua Institute of Science and Technology.

Table 4.9:***Analysis of Variance (ANOVA) for Cloud Cost***

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	881.772	1	881.772	29.580	.000 ^a
	Residual	2864.4361	114	25.123		
	Total	3746.208	115			

Analysis of regression model coefficients was carried out and the results are shown in Table 4.10. The table shows that there is a negative beta coefficient of 0.631 as indicated in the coefficient's matrix with a p-value= 0.00 and a constant of 8.765 with a p-value of 0.000 which is less than 0.05. Hence, both the constant and cloud cost contribute significantly to the model. The model can provide the information needed to predict record maintenance from cloud cost. The regression equation is presented as; $Y = 8.765 - 0.631X_2$ where Y is the record maintenance and X_2 is the cloud cost. These findings implied that a unit change in X_2 will increase the effectiveness of record maintenance by 0.631 units and that in the absence of cloud cost, the record maintenance will still be positive at 8.765 since there are other factors which affect the record maintenance such as network accessibility, shared infrastructure, and network security.

Table 4.10***Cloud Cost and Record maintenance***

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
	B		Beta		
(Constant)	8.765	1.699		1.611	0.000
Cloud Cost	-0.631	0.184	0.452	-3.429	0.000

a. Dependent variable: Record maintenance**4.9.4 Regression model of Cloud Cost on Record Maintenance**

Regression analysis was carried out to determine the amount of variation in record maintenance explained by the cloud cost. The calculated R-value was 0.453. The R square was equal to 0.205 while the adjusted R square was 0.202 which means that 20.2% of the corresponding variation in record maintenance can be explained by change in the cloud cost. The rest 79.8% was attributable to other factors not in the model. The Pearson correlation coefficient r was -0.557 with a p -value of 0.00 which was less than 0.05. Therefore, the correlation coefficient of -0.557 implied a significant negative relationship between the cloud cost and record maintenance. The results were as presented in table 4.11

Table 4.11***Correlations of Cloud Cost and Record Maintenance***

		Correlation	
Record maintenance			Cloud Cost
Cloud Cost	Pearson Correlation	-.557**	1
	Sig (2-tailed)	.000	.000
	N	115	115
R		0.453	
R Square		0.205	
Adjusted R square		0.202	
Std. Error of the estimate		1.6811	

**** means significant at 5%**

4.9.5 Analysis of variance (ANOVA) for Shared infrastructure

The ANOVA results in table 4.12 indicate that the model fit was appropriate for this data since the F-value was 46.992 with the p-value of 0.000 which was less than 0.05 implies that the model is significant in predicting record maintenance in Nyandarua Institute of Science and technology. Hence, this study confirms that indeed the cloud shared infrastructure has a significant effect on record maintenance.

Table 4. 12

Analysis of Variance (ANOVA) for Shared Infrastructure

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	1135.183	1	1135.183	46.992	.000 ^a
	Residual	2562.080	114	22.474		
	Total	3696.263	115			

a. Predictors: (Constant), Shared infrastructure.

Analysis of regression model coefficients was carried out and the results are shown in Table 4.13. The table shows that there is a negative beta coefficient of 0.725 as indicated in the coefficient's matrix with a p-value= 0.00 and a constant of 6.408 with a p-value of 0.000 which is less than 0.05. Hence, both the constant and shared contribute significantly to the model. The model can provide the information needed to predict record maintenance from shared infrastructure. The regression equation is presented as; $Y = 6.408 + 0.725X_3$ where Y is the record maintenance and X_3 is shared infrastructure. These findings implied that a unit change in X_3 will increase the effectiveness of record maintenance by 0.725 units and that in the absence of shared infrastructure, the record maintenance will still be positive at 6.408 since other factors affect the record maintenance.

Table 4. 13:***Shared Infrastructure and Record maintenance***

Model	Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.
	B		Beta		
(Constant)	6.408	1.877		3.414	0.000
Cloud computing cost	0.725	0.192	0.435	3.776	0.000

a. Dependent variable: Record maintenance**4.9.6 Regression model of Shared infrastructure on Record maintenance**

Regression analysis was carried out to determine the amount of variation in record maintenance explained by shared infrastructure. The calculated R-value was 0.39. The R square was equal to 0.1521 while the adjusted R square was 0.1520 which means that 15.2% of the corresponding variation in record maintenance can be explained by change in shared infrastructure. The rest 84.8% was attributable to other factors not in the model. The Pearson correlation coefficient r was 0.39 with a p-value of 0.008 which was less than 0.05. Therefore, the correlation coefficient of 0.39 implied a significant positive relationship between shared infrastructure and record maintenance. The results were as presented in table 4.14.

Table 4. 14***Correlations of Shared Infrastructure and Record Maintenance***

Correlation			
Record Maintenance	Network Accessibility		
Network Accessibility	Pearson Correlation	.39**	1
	Sig (2-tailed)	.0008	.000
	N	115	115
R		0.39	
R Square		0.1521	
Adjusted R square		0.1520	

Std. Error of the estimate

1.7530

**** means significant at 5%**

4.9.7 Analysis of variance (ANOVA) for Network Security

The ANOVA results in table 4.15 indicate that the model fit was appropriate for this data since the F-value was 28.577 with a p-value of 0.003 which was less than 0.05 implies that the model is significant in predicting record maintenance in Nyandarua Institute of Science and Technology. Hence, this study confirms that indeed the cloud Network Security has a significant effect on record maintenance.

Table 4. 15:

Analysis of Variance (ANOVA) for Network Security

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	953.46	1	953.46	28.577	.003 ^a
	Residual	1643.06	114	14.413		
	Total	2596.52	115			

a. Predictors: (Constant), Network Security.

Analysis of regression model coefficients was carried out and the results are shown in Table 4.16. The table shows that there is a positive beta coefficient of 0.833 as indicated in the coefficient's matrix with a p-value= 0.00 and a constant of 3.744 with a p-value of 0.000 which is less than 0.05. Hence, both constant and network security contribute significantly to the model. The model can provide the information needed to predict record maintenance from Network Security. The regression equation is presented as; $Y = 3.744 + 0.833X_4$ where Y is the record maintenance and X_4 is Network Security. These findings implied that a unit change in X_4 will increase the effectiveness of record maintenance by 0.833 units and that in the absence of Network Security, the record maintenance will still be positive at 3.744 since other factors affect the record maintenance.

Table 4. 16:

Network Security and Record Maintenance

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	3.744	1.742		2.1493	0.000
Network Security	0.833	0.256	0.675	3.254	0.000

a. Dependent variable: Record maintenance

4.9.8 Regression Model of Network Security on Record maintenance

Regression analysis was carried out to determine the amount of variation in record maintenance explained by network security. The calculated R-value was 0.652. The R square was equal to 0.425 while the adjusted R square was 0.424 which means that 42.4% of the corresponding variation in record maintenance can be explained by the change in network security. The rest 57.6% was attributable to other factors not in the model. The Pearson correlation coefficient r was 0.76 with a p-value of 0.011 which was less than 0.05. Therefore, the correlation coefficient of 0.76 implied a significant positive relationship between network security and record maintenance. The results were as presented in table 4.16

Table 4. 17:

Correlations of Network Security and Record maintenance

		Correlation	
Record Maintenance	Network Accessibility		
Network Accessibility	Pearson Correlation	.76**	1
	Sig (2-tailed)	.0011	.000
	N	115	115
R		0.652	
R Square		0.425	
Adjusted R square		0.424	
Std. Error of the estimate		1.9860	

** means significant at 5%

4.10 Combined Effect of all the Independent Variables on Record Maintenance

The study aimed at establishing the effect of the independent variables that are network accessibility, Cloud cost, shared infrastructure and network security on the Record maintenance. The model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$ explained 75.7% of the variations in record maintenance as shown in model summary table 4.5.17 which implied that network accessibility, Cloud cost, shared infrastructure, and network security explained 75.7% of the variations in Record maintenance. The remaining 24.7% was attributed to other factors not included in this model.

Table 4.18:

Model Summary of the Combined Effect

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.873 ^a	.763	.757	4.70382

a. Predictors: Network accessibility, Cloud cost, shared infrastructure and network security

Analyzing the results presented in table 4.19 the model fit is significant for this data since the F-value was 33.752 at $p = 0.0051$ which was significant since p was less than 0.05 with 111 degrees of freedom which implies that Network accessibility, Cloud cost, Shared infrastructure, and network security have a significant, combined effect on record maintenance. Therefore, the study stated that cloud technology has a significant effect on record maintenance at the Nyandarua Institute of Science and Technology.

Table 4. 19:

Analysis of Variance (ANOVA) for all the independent variables

Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	3629.835	4	3629.835	33.752	.0051 ^a
	Residual	2301.721	111	20.730		
	Total	5931.556	115			

Analysis of regression model coefficients was carried out and the results are shown in Table 4.5.19. The table shows that there is a positive constant of 2.875 and beta coefficient of 0.121 for network accessibility (X_1) with a p-value of 0.0283, a negative beta coefficient of 0.274 for cloud computing cost (X_2) with a p-value of 0.0371, positive beta coefficient of 0.463 for shared infrastructure (X_3) with a p-value of 0.000 and positive 0.652 for network security (X_4) with a p-value of 0.0287. The constant and all the independent variables were significant since their p-values were all less than 0.05. The constant value was zero and therefore the model was passing through the origin. Hence, network accessibility, cloud cost, shared infrastructure, and network security contribute significantly to the model which therefore can provide the information needed to predict record maintenance. Table 4.20 shows that the fitted model was $Y = 2.875 + 0.121X_1 - 0.274X_2 + 0.463X_3 + 0.652X_4$ where Y is record maintenance.

Table 4.20***Effect of Cloud technology on Record Maintenance***

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	2.875	0.153	0.675	18.791	0.000
Network Accessibility	0.121	0.057	0.261	2.123	0.0283
Cloud Cost	-0.274	0.081	0.075	-3.383	0.0371
Shared Infrastructure	0.463	0.140	0.031	3.307	0.000
Network Security	0.652	0.074	0.059	8.811	0.0287

a. Dependent variable: Record Maintenance**4.11 Content Analysis**

Content analysis of data was also done on the qualitative responses provided by the 7 HODs on the interview questions provided. Information is provided in the following section.

4.11.1 Network Accessibility and Record Maintenance

The respondents' opinion on the effect of network accessibility on record maintenance at Nyandarua Institute of Science and Technology was sought. The variables that were considered for network accessibility in this study was; use of manual accessibility, accessibility of manual records verses electronic records.

The Head of Department for ICT stated that;

“Electronic records are easy of access once the user has the required access credentials as opposed to manual records which are bulky and located at a specific place. Electronic records can be accessed by the users in different locations within and outside the institute on a real-time basis”

The records officer noted that the Institution encouraged employees to maintain electronic records since they were not easy to access by unauthorized persons. Therefore, these results implied a belief among Nyandarua Institute of Science and Technology employees that records in the cloud were easy to maintain, unlike manual files. The findings implied that the Nyandarua Institute of Science and Technology emphasized on cloud technology intending to achieve effective record maintenance.

4.11.2 Cloud Cost Effectiveness and Record Maintenance

On the effect of cloud cost-effectiveness, the study sought to investigate whether the Nyandarua Institute of Science and Technology incurred a cost in record maintenance. *The Finance officer who keeps the institute's financial records stated that;* “It is costly to initially have a cloud-based record management system but the long-run costs declined. However, manual record management was found to be comparatively more costly compared to cloud-based”.

Again, the officer noted that manual records in hard copy files were costly to purchase occupied a lot of space and required a clerical officer to keep or trace them whenever they were required. The officer recommended for electronic records to cut on cost implications when using manual records.

4.11.3 Shared Cloud Infrastructure and Record Maintenance

The registrar, when asked whether files and other records were easy to share across departments and users, stated that;

“Cloud-based records were easy to share on a real-time basis without compromising the integrity of the information store in the records. The units within the institution were able to share records without having to search for the manual records in files”.

The same views were shared by the head of Liberal Studies department who when asked why the department advocated for an electronic method of record maintenance such as the cloud-based systems and stated that;

“For easy sharing of records and other information, cloud provides an efficient mechanism in which all the required data, information and records could be accessed easily between departments which are often not under the same roof”

The records officer was asked the same question on whether a cloud-based record system made their work easier and the response was in the affirmative. The officer stated that;

“Users of cloud-based records spend less time tracing them; they don’t move up and down looking for hard copy documents and don’t have to worry on the share -ability of any records”

4.11.4 Cloud System Security and Record Maintenance

The respondents indicated that the cloud-based record system was more secure since access was for only approved personnel with relevant access credentials such as passwords. The security was further enhanced by the fact that the records were not physical and hence not exposed to physical damage or deterioration ad even theft. The examinations officer was asked on the security level of students’ examination related records and the response was as follows;

“Since the majority of essential student examination related information is kept in soft copy form, no unauthorized person can access such information since the office is always under lock and key, the computers having such information are accessible only through an encrypted password and access to them is highly restricted. Such measures ensure that all the records are not interfered with and therefore maintenance is assured since information relating to a learner can be retained for many years”.

The academic registrar who is tasked with maintaining the records of all the trainees in the institute was asked to compare manual and electronic, cloud-based records. His response was as follows;

“Cloud-based record maintenance is more secure as compared to hard copy files that can easily be lost or destroyed by malicious persons. The cloud-based records can be kept in intangible form, accessible only through credentials such as passwords and have a backup maintained in a server in a different location. Therefore, security-wise, cloud-based records are preferred since they guarantee record maintenance in the institute”.

Table 4. 21

Comparative matrix

Variable	Manual Records	Electronic Records
Security	30% secure	70% Secure
Accessibility	Between 10-20 minutes after inquiry	Real time/ Instant
Cost	Highly costly in terms of required space, equipment and personnel	Cheap in terms of space, storage capacity e.g 4GB flash disk can hold voluminous data.
Share-ability	Not easy to share files and data in hard copy	Simultaneous sharing is possible

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, the conclusions drawn from the findings, the study recommendations and the suggested areas for further studies. The study sought to examine the effect of cloud on record maintenance in the Nyandarua Institute of Science and Technology.

5.2 Summary of the Findings

The study examined the determinants of cloud record maintenance at the Nyandarua Institute of Science and Technology. The study was guided by the following specific objectives; to determine the effect of cloud network accessibility on record maintenance at Nyandarua Institute of Science and Technology, to establish the effect of cloud cost and record maintenance at Nyandarua Institute of Science and Technology, examine the effect of cloud shared infrastructure on record maintenance at Nyandarua Institute of Science and Technology, investigate the effect of cloud network security on record maintenance at Nyandarua Institute of Science and Technology. The sample was 125 respondents out of which 115 questionnaires were received duly filled and used for analysis. The study aimed at establishing the effect of the independent variables that are cloud network accessibility, Cloud cost, cloud shared infrastructure and cloud network security on the Record maintenance. The model explained 75.7% of the variations in record maintenance which implied that network accessibility, Cloud cost, shared infrastructure, and network security explained 75.7% of the variations in Record maintenance. The remaining 24.7% was attributed to other factors not included in this model.

The model fit is significant for this data since the F-value was 33.752 at $p = .0051$ which was significant since p was less than 0.05 with 111 degrees of freedom which implies that Network accessibility, Cloud Cost, Shared infrastructure and network security have a significant, combined effect on record maintenance. Therefore, the study stated that cloud technology has a significant effect on record maintenance at the Nyandarua Institute of Science and Technology. There is a positive constant of 2.875 and beta coefficient of 0.121 for network accessibility (X_1) with a p -value of 0.0283, a negative beta co-efficient

of 0.274 for cloud computing cost (X_2) with a p-value of 0.0371, positive beta coefficient of 0.463 for shared infrastructure (X_3) with a p-value of 0.000 and positive 0.652 for network security (X_4) with a p-value of 0.0287. The constant and all the independent variables were significant since their p-values were all less than 0.05. Hence, cloud network accessibility, cloud cost, cloud shared infrastructure, and cloud network security contribute significantly to the model which therefore can provide the information needed to predict cloud record maintenance. The fitted model was $Y = 0.121 X_1 - 0.274 X_2 + 0.463 X_3 + 0.652 X_4$ where Y is record maintenance.

5.2.1 Relationship between Cloud Network Accessibility and Record Maintenance

The results indicated that model fit was appropriate for this data since F –Value was 40.037 and the p-value of 0.000 was less than p-critical of 0.05 implying a significantly positive relationship between network accessibility and record maintenance. Therefore, network accessibility has a statistically significant positive effect on record maintenance.

The calculated R-value was 0.57. The R square was equal to 0.325 while the adjusted R square was 0.323 which means that 32.3% of the corresponding variation in record maintenance can be explained by the change in network accessibility. The rest 67.7% was attributable to other factors not in the model. The Pearson correlation coefficient r was 0.57 with a p-value of 0.00 which was less than 0.05. Therefore, the correlation coefficient of 0.57 implied a significant positive relationship between network accessibility and record maintenance and the fitted model $Y = 7.951 + 0.464 X_1$. These findings implied that a unit change in X_1 will increase record maintenance by 0.464 units and that in the absence of Network accessibility, the record maintenance will still be positive at 7.951 since there are other factors that affect the record maintenance such as Cloud cost, shared infrastructure and network security.

The respondents' opinion on the effect of network accessibility on record maintenance at Nyandarua Institute of Science and Technology was sought. The variables that were considered for network accessibility in this study were; use of manual and electronic records, accessibility of manual and electronic records, record maintenance in the cloud technology to manage record maintenance. The study sought to determine if the Institutions promoted the use of cloud technology that is a determinant to effective record management. The Nyandarua Institute of Science and Technology maintained manual

records. The Institution's emphasis on making records easily accessible was realized. These findings implied that the Institution encouraged employees to maintain electronic records since they were not easy to access by unauthorized persons. The aspect of whether the institution's records were maintained in cloud technology was tested. The study sought to establish whether the Institution records in cloud was more accessible and that the Nyandarua Institute of Science and Technology emphasized on cloud technology with the aim of achieving record maintenance.

5.2.2 Relationship between Cloud Cost on Record Maintenance

On the effect of cloud technology, the study sought to investigate whether the Nyandarua Institute of Science and Technology incurred a cost in record maintenance. It was established that it is costly to maintain manual records as compared to electronic records, further; it was determined that electronic record system was initially costly but cheap in the long-run.

The ANOVA results indicated that model fit was appropriate for this data with an F-value of 29.59 since the p-value of 0.000 was less than p-critical of 0.05 implying that the model is significant in predicting record maintenance in Nyandarua Institute of Science and technology. Hence, this study confirms that indeed the cost of cloud technology has a significant effect on record maintenance.

Analysis of regression model coefficients was carried out and the results indicated a negative beta coefficient of 0.631 as indicated in the coefficient's matrix with a p-value= 0.00 and a constant of 8.765 with a p-value of 0.000 which is less than 0.05. Hence, both the constant and cost of cloud technology contribute significantly to the model. The model can provide the information needed to predict record maintenance from the cost of cloud technology. The regression equation is presented as; $Y = 8.765 - 0.631X_2$ where Y is the record maintenance and X_2 is the cost of cloud technology. These findings implied that a unit change in X_2 will increase the effectiveness of record maintenance by 0.631 units and that in the absence of Cloud cost, the record maintenance will still be positive at 8.765 since there are other factors which affect the record maintenance such as network accessibility, shared infrastructure, and network security.

Regression analysis indicated that the calculated R-value was 0.453. The R square was equal to 0.205 while the adjusted R square was 0.202 which means that 20.2% of the

corresponding variation in record maintenance can be explained by change in the cloud cost. The rest 79.8% was attributable to other factors not in the model. The Pearson correlation coefficient r was -0.557 with a p -value of 0.00 which was less than 0.05 . Therefore, the correlation coefficient of -0.557 implied a significant negative relationship between the cloud cost and record maintenance.

5.2.3 Relationship between Cloud Shared Infrastructure and Record Maintenance

Regarding the effect of shared infrastructure on record maintenance, it was established that cloud technology led to the development of shared infrastructure and hence effective records maintenance since cloud technology enabled the users to share records with various other users simultaneously. The study established that the records in the cloud were easy and cheap to reproduce to multiple users.

The ANOVA results indicated that the model fit was appropriate for this data since the F -value was 46.992 with the p -value of 0.000 which was less than 0.05 implies that the model is significant in predicting record maintenance in Nyandarua Institute of Science and Technology. Hence, this study confirms that indeed the shared infrastructure as a result of cloud technology has a significant effect on record maintenance in the Nyandarua Institute of Science and Technology.

Analysis of regression model coefficients was carried out and the results indicated a beta coefficient of 0.725 as indicated in the coefficient's matrix with a p -value = 0.00 and a constant of 6.408 with a p -value of 0.000 which is less than 0.05 . Hence, both the constant and shared contribute significantly to the model. The model can provide the information needed to predict record maintenance from shared infrastructure. The regression equation is presented as; $Y = 6.408 + 0.725X_3$ where Y is the record maintenance and X_3 is shared infrastructure. These findings implied that a unit change in X_3 will increase the effectiveness of record maintenance by 0.725 units and that in the absence of shared infrastructure, the record maintenance will still be positive at 6.408 since other factors affect the record maintenance.

Regression analysis was carried out to determine the amount of variation in record maintenance explained by shared infrastructure. The calculated R -value was 0.39 . The R square was equal to 0.1521 while the adjusted R square was 0.1520 which means that 15.2% of the corresponding variation in record maintenance can be explained by change

in shared infrastructure. The rest 84.8% was attributable to other factors not in the model. The Pearson correlation coefficient r was 0.39 with a p -value of 0.008 which was less than 0.05. Therefore, the correlation coefficient of 0.39 implied a significant positive relationship between shared infrastructure and record maintenance.

5.2.4 Cloud System Security and Record Maintenance

It was established that cloud-based records were cost-effective to maintain as was ascertained by lower costs of maintaining records in a cloud. Further, the study established that record security was paramount for institutions and therefore the findings from the study showed a strong correlation between cloud technology and system security. The records were secure in cloud and, therefore easy to maintain. The ANOVA results indicated that the model fit was appropriate for this data since the F -value was 28.577 with the p -value of 0.003 which was less than 0.05 implies that the model is significant in predicting record maintenance in Nyandarua Institute of Science and Technology. Hence, this study confirms that indeed the Network Security as a result of cloud technology has a significant effect on record maintenance. Analysis of regression model coefficients was carried out and the results showed a positive beta coefficient of 0.833 as indicated in the coefficient's matrix with a p -value= 0.00 and a constant of 3.744 with a p -value of 0.000 which is less than 0.05. Hence, both constant and network security contribute significantly to the model. The model can provide the information needed to predict record maintenance from Network Security. The regression equation is presented as; $Y = 3.744 + 0.833X_4$ where Y is the record maintenance and X_4 is Network Security. These findings implied that a unit change in X_4 will increase the effectiveness of record maintenance by 0.833 units and that in the absence of Network Security, the record maintenance will still be positive at 3.744 since other factors affect the record maintenance. Regression analysis was carried out to determine the amount of variation in record maintenance explained by network security. The calculated R -value was 0.652. The R square was equal to 0.425 while the adjusted R square was 0.424 which means that 42.4% of the corresponding variation in record maintenance can be explained by the change in network security. The rest 57.6% was attributable to other factors not in the model. The Pearson correlation coefficient r was 0.76 with a p -value of 0.011 which was

less than 0.05. Therefore, the correlation coefficient of 0.76 implied a significant positive relationship between network security and record maintenance.

5.3 Conclusion

From the study findings, it can be concluded that Network accessibility has a significant effect on record maintenances and is one aspect that Nyandarua Institute of Science and Technology seeking to have a smooth and effective record maintenance process and should put much focus in. Further, it can be concluded that to benefit from records that are well maintained, the Nyandarua Institute of Science and Technology must encourage employees to keep the records in online electronic forms where they are easy to maintain. Electronic records are easy to access once the user has the required access credentials as opposed to manual records which are bulky and located at a specific place. Electronic records can be accessed by users in different locations within and outside the institute on a real-time basis.

Secondly, Cloud technology is cost-effective since maintaining records in cloud is cheaper as compared to manual records in which hard files are expensive to acquire and maintain. It is costly to initially have a cloud-based record management system but the long-run costs declined. However, manual record management was found to be comparatively more costly compared to cloud-based.

Thirdly, Cloud technology facilitates the sharing of records across departments in real-time and ensures easy control of sensitive records. For easy sharing of records and other information, the cloud technology provided an efficient mechanism in which all the required data, information and records could be accessed easily between departments which are often not under the same roof and users of cloud-based records spend less time tracing them, they don't move up and down looking for hard copy documents and don't have to worry on the share-ability of any records.

Lastly, it is easier to maintain record security in a cloud technology. The use of passwords and encryption codes promotes record security in the institution. Therefore, Cloud-based records are more secured as compared to hard copy files which can easily be lost or destroyed by malicious persons. The cloud-based records can be kept in intangible form, accessible only through credentials such as a password and have a back-up

maintained in a server in a different location. Therefore, security-wise, cloud-based records are preferred since they guarantee record maintenance in the institution.

5.4 Recommendations

The following recommendations were made from the study to the Nyandarua Institute of Science and Technology:

5.4.1 Cloud Network Accessibility and Record Maintenance

To have effective records maintenance, there should be a greater focus on building effective record maintenance systems through the cloud technology where records are easy to share, cheap to maintain, less costly to maintain and secure.

5.4.2 Cloud Cost and Record Maintenance

The Institution management should focus on employee empowerment through a series of training programs, seminars and workshops to equip them with knowledge and skills essential in implementing the records maintenance system. The employees should also be recognized and rewarded to motivate them for their engagement in the cloud records maintenance. Lastly, the Nyandarua Institute of Science and Technology should be ready to experiment on new ideas and accept trial ideas from outside sources on how well to have effective records maintenance.

5.4.3 Cloud System Security and Record Maintenance

It is easier to maintain record security in a cloud technology. The use of passwords and encryption codes promotes record security in the institution. Therefore, a Cloud-based record platform is more secured as compared to hard copy files that can easily be lost or destroyed by malicious persons. The cloud-based records can be kept in intangible form, accessible only through credentials such as a password and have a back-up maintained in a server in a different location.

5.4.4 Shared Cloud Infrastructure and Record Maintenance

Cloud technology facilitates the development of shared infrastructure and hence effective records maintenance since cloud technology enables the users to share records with various other users simultaneously. The study established that the records in the cloud were easy and cheap to reproduce to multiple users.

5.4.5 Recommendation to the Government

There is a need for the government to support effective record maintenance in cloud since electronic records are easy to access once the user has the required access credentials as opposed to manual records which are bulky and located at a specific place. Electronic records can be accessed by users in different locations within and outside the institute on a real-time basis. Records in the cloud are cost-effective since maintaining records in the cloud is cheaper as compared to manual records in which hard files are expensive to acquire and maintain. It is costly to have a cloud-based record management system but the long-run costs declined. However, manual record management was found to be comparatively more costly compared to cloud-based records.

Cloud technology also facilitates the sharing of records across departments and regions in real-time and ensures easy control of sensitive records. For easy sharing of records and other information, the cloud technology provided an efficient mechanism in which all the required data, information and records could be accessed easily between departments which are often not under the same roof and users of cloud-based records spend less time tracing them, they don't move up and down looking for hard copy documents and don't have to worry on the share-ability of any records, therefore the government should allocate fund to facilitate integration of ICT's in record maintenance in institutions of higher learning.

5.4.6 Recommendation to the Tertiary Institutions

The tertiary Institutions should adopt a cloud technology as an alternative to manual records since the security of cloud records and data is comparatively more secure, has instantaneous access time and very cheap compared to manual records in terms of storage space, equipment and personnel. The cloud-based records and data are also easily shareable among users.

5.5 Recommendations for Further Research

The study focused on cloud network accessibility, costs of cloud technology, cloud shared infrastructure, and cloud network security. These are not the only aspects of cloud technology that can have an effect on record maintenance for Nyandarua Institute of Science and Technology. The study, therefore, suggested for replica studies covering other aspects of cloud record maintenance.

Subsequent studies should also consider the effect of cloud technology on aspects like employee performance, employee cohesion and overall record maintenance especially private sector institutions, manufacturing firms and learning institutions that may have challenges maintaining records.

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APPENDIX I: QUESTIONNAIRE

The researcher administered the questionnaire personally so as to increase the interaction with the respondents and the response rate

Please indicate by ticking appropriately the response that in your opinion is correct

PART A: General information

1. What is your gender? Male
Female
2. What is your age group? 18-30 years
31- 40 years
41-50 years
Over 50 years
3. What is your highest level of education?
Primary
Secondary
University
Post graduate

PART B: NETWORK ACCESSIBILITY DUE TO CLOUD COMPUTING

1. On a scale of 1-5, what is your level of agreement with the following statements concerning network accessibility due to cloud technology and record maintenance? Please indicate by ticking only one in the scale where 5= strongly agree and 1= strongly disagree.

Network accessibility	SA	A	N	D	SD
Nyandarua Institute maintains both manual and electronic records					
Manual records are easily accessible					
Electronic records are not easily accessible to unauthorized persons					
Most records for the institution are kept a cloud technology					
Which one according to you is more accessible					

between manual and electronic records?					
Cloud technology manages records accessibility					
Cloud technology facilitates record maintenance to a large extent					

PART C: COST-EFFECTIVENESS DUE TO CLOUD COMPUTING

2. On a scale of 1-5, what is your level of agreement with the following statements concerning cloud cost-effectiveness on record maintenance? Please indicate by ticking only one in the scale where 5= strongly agree and 1= strongly disagree

Cost effectiveness	SA	A	N	D	SD
Maintaining the institutions records has a cost implication					
Manual records are more costly to maintain					
Electronic record system is initially costly but cheap in the long run					
The loss of records can have major impact on the institution in terms of costs of recovery					
Record maintenance in a cloud technology is comparatively cheap					

PART D: SHARED INFRASTRUCTURE DUE TO CLOUD COMPUTING

3. On a scale of 1-5, what is your level of agreement with the following statements concerning cloud shared infrastructure on record maintenance? Please indicate by ticking only one in the scale where 5= strongly agree and 1= strongly disagree

Shared infrastructure	SA	A	N	D	SD
Cloud technology facilitates real time accessibility of records					
Manual records are not easy to share simultaneously					
Electronic records can be used by various users at the					

same time					
Records in cloud can be shared among users in diverse geographical locations					
Records in cloud technology are easy and cheap to reproduce for multiple users					
Electronic records are easily shareable and easy to maintain due to available back-up in other locations					

PART E: NETWORK SECURITY DUE TO CLOUD COMPUTING

4. On a scale of 1-5, what is your level of agreement with the following statements concerning cloud network security on record maintenance? Please indicate by ticking only one in the scale where 5= strongly agree and 1= strongly disagree

Network security	SA	A	N	D	SD
Manual records are not secure since they can be accessed by unauthorized persons					
Electronic records require authorization to access and are therefore comparatively secure					
Record in a cloud technology are highly secure and cannot be lost easily					
It is comparatively easy to maintain records in cloud.					

APPENDIX II: INTERVIEW SCHEDULE FOR THE HEAD OF DEPARTMENTS

1. Gender? Male () Female () (Tick One)

2. What is your position in Nyandarua Institute of Science and Technology?

3. Do you share records with other members of staff? Yes () No ()

If yes, please describe how you share your records with your colleagues?

.....
.....
.....

4. To what extent does network accessibility assist in sharing records with other members of staff?

.....
.....
.....

5. How do you share records with the other members of the institution?

.....
.....
.....

6. Do you actively share records with other employees?

Yes () No ()

If yes, please describe how you share the records?

.....
.....
.....

7. Are there challenges you face when accessing manual records?

Yes () No ()

If yes, please describe the challenges in place that you face when accessing manual records?

.....
.....
.....

8. What motivates you to share records with your colleagues?

.....
.....
9. To what extent do you trust your colleagues to share records with them?

.....
.....
10. Does the top management support members of staff in sharing records?

Yes () No ()

If yes, how does the top management support the staff in sharing records?

.....
.....
11. Does NIST have adequate network security in place to support the maintenance of records?

Yes () No ()

If yes, please describe the network security available that support the maintenance of records

.....
.....
12. Do you experience any challenges when sharing manual records?

Yes () No ()

If yes, please describe the challenges you experience when sharing manual records?

.....
.....
13. Are there any measures that have been taken to solve the challenges?

Yes () No ()

If yes, please describe the measures that have been taken to solve the challenges?

.....
.....
If no, please describe the measures you would recommend to solve the challenges?

APPENDIX III: INTRODUCTION LETTER



Kenya Methodist University

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July 20, 2020.

TO WHOM IT MAY CONCERN

RE: PAULINE WANGUI KARIUKI ISK-3-2848-2/2015

This is to confirm that the above named is a student in the Department of Information Science, in this university, pursuing a Master of Information Science.

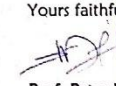
As a requirement, the student is expected to undertake an independent primary research in their area of specialization.

The purpose of this letter is therefore; to introduce the student to you and request you to allow her undertake the research in your organization.

The student has been advised to ensure that all data and information from the organization is treated with utmost confidentiality and only used for academic purposes unless otherwise stated.

Any assistance accorded to her will be highly appreciated.

Yours faithfully,


Prof. Peter Kihara, PHD.
Registrar - Academic Affairs



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The Future is Here!

APPENDIX IV: RESEARCH PERMIT



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

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Ref No. **NACOSTI/P/18/86989/21942**

Date: **26th March, 2019**

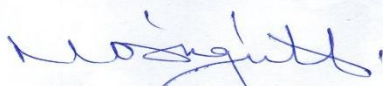
Pauline Wangui Kariuki
Kenya Methodist University
P.O. Box 267- 60200
MERU.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “ *Cloud record maintenance in Technical Vocational Education Training Institution in Kenya: A case study of Nyandarua Institute of Science and Technology* ,” I am pleased to inform you that you have been authorized to undertake research in **Nyandarua County** for the period ending **23rd March, 2020**.

You are advised to report to **the Principal of the selected TVET Institution , the County Commissioners and the County Directors of Education, Nyandarua County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.


DR. M.K. RUGUTT, PhD, OGW
DIRECTOR GENERAL

Copy to:

The Principals
Selected TVET Institutions.

The County Commissioner
Nyandarua County.

National Commission for Science, Technology and Innovation is ISO9001: 2008 Certified