IMPLEMENTATION OF CLOUD COMPUTING STRATEGY BY COMMERCIAL BANKS IN KENYA

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DECLARATION

Student’s declaration

I hereby declare that this proposal is my original work and has not been in any other institution for any other academic award in any other institution. I also declare that the material contained in this work has neither been published nor written by other people apart from other materials from which references are drawn from, and the authors acknowledged accordingly.

Sign: ____________________                                    Date: ________________

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D61/72850/2014

Supervisor’s declaration

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

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To all my classmates of 2014, Management practices class for the great moments through this academic journey and for the untold support through groups and at individual capacity. Your intelligence and ability is outstanding and a great resources
ABSTRACT

Globally, the need for implementation of cloud computing strategy has recently received much attention as commercial banks seek to improve their services in order to enhance customer service. This study was carried out objectively with the intention of establishing the factors influencing the implementation of cloud computing strategy by Commercial Banks in Kenya, establishing the major benefits of implementation of cloud computing strategy by Commercial Banks in Kenya, and also finding out the challenges facing the implementation of cloud computing strategy by Commercial Banks in Kenya. The study used descriptive survey research design via the employment quantitative as well as qualitative research methods. The sample size of the study was attained via census method to reach 43 respondents from of all the 43 commercial banks in Kenya. Data was collected using questionnaires, which were administered by the researcher so as to achieve a higher feedback rate to the selected respondents. Analysis of the collected qualitative data was done and presented by the use of SPSS (statistical package for social sciences) and frequency tables, charts and mean scores was used to present and interpret the data. Additionally, data collected from the open ended questions (qualitative) was analyzed using qualitative content analysis to establish the expected results. The study findings indicated the major factors that influenced the implementation of cloud computing strategy in commercial banks in Kenya included security, market dynamics, performance, reliability, compliance and environmental issues. The study also found out that the cloud computing strategy is beneficial to the commercial banks in enhancing the efficiency of operations, hence; has been implemented and continues to be adopted, and that there are major challenges including security issues that banks need to overcome for effective strategy implementation. The study recommends that; since most of the commercial banks in Kenya have implemented cloud computing strategy in their operational systems, it is important for the management of these banks, especially the Information Communication Technology to emphasize on the importance of cloud computing strategy in the banks. This will ensure that all operations are connected to the cloud, and that efficiency of operations is enhanced.
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<thead>
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<th>Abbr.</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>IT</td>
<td>Information Technology</td>
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<td>CC</td>
<td>Cloud Computing</td>
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<td>CCS</td>
<td>Cloud Computing Strategy</td>
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<td>CCT</td>
<td>Cloud Computing Technology</td>
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<td>DOI</td>
<td>Diffusion on Innovation</td>
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<td>TOE</td>
<td>Technology, Organization, and Environment Framework</td>
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<tr>
<td>(IOSs)</td>
<td>Inter-organizational systems</td>
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<td>KCBs</td>
<td>Kenya Commercial Banks</td>
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<td>CBK</td>
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CHAPTER ONE
INTRODUCTION

1.1 Background of the study

Globally, the need for implementation of cloud computing strategy has recently received much attention as commercial banks seek to improve their services. The recent years have seen the majority of organizations invest in considerable internal computerization capacities as well as staff who have specialized in IT (Information Technology) All over the world, so as to provide adequate support to their most important processes of business, or to attain a high competitive advantage over other organizations (Bildosola, Río-Belver, Cilleruelo & Garechana, 2015).

Cloud computing as a strategy entails the utilization of computer services that are provisioned dynamically, and consisting of a mixture of application frameworks or capacity of hardware to users via centers of data that are large, and that are disbursed geographically on the basis of distinct agreements of service levels. In the cloud computing environment, working is through virtualized applications on a networked architecture. According to De Meijer & Brown (2014), most organizations desire to undertake tasks which ultimately give high income, and in most cases are willing to spend money paying for services they are in need of, not essentially what currently have. As an organization grows, flexibility and scalability of IT infrastructure becomes essential.

Cloud computing strategy provides a description of an extensive movement to provide treat Information Technology services as a product that has the ability of dynamically increasing or decreasing capacity of matching usage requirements in Kenya’s commercial banking institutions (Horrigan, 2008). By controlling infrastructure that is shared as well as organizational economies of scale, the strategy of cloud computing provides commercial banks in Kenya with a coercive model of business. It allows the users of the cloud to have control of computing services that they have access to, as they also share the venture in the fundamental resources of information technology among all the consumers. The commercial banks accrue their benefits from high economies of scale that on the other hand enable them to cut down costs of individual usage as well as provide infrastructural costs that are centralized. Outstandingly, the strategy of cloud computing provides the economies of scale benefit, that way reducing electricity cost, hardware and operations as a well as bandwidth. It offers on-demand services just as other usefulness
providers. This is essential in allowing consumers to use only the computing supplies they need and also make payment for the used service (Youseff, Butrico and Da Silva, 2008).

Various theories have been put forward by researchers that help understand the concept of cloud computing strategy implementation in organizations. First cloud computing strategy implementation is explained using Diffusion on innovation (DOI) theory that was developed by Rogers (1995). The Diffusion of Innovation puts across that individual features, internal features of structure of organizations, and external features of the business are significant qualifications to innovativeness in organizations, which on the other hand acts as the determinants of any technological implementation. The TOE (technology, organization, and environment) framework is as well as very imperative as Tornatzky and Fleischer (1990) developed it. The technology, organization, and environment framework recognizes three features of enterprises’ context, which manipulate the processes by which they adopt and implement technological innovations. These include technological context, organizational context, and environmental context, all which the commercial banks in Kenya are needed to consider in cloud computing strategy implementation. Further, the institutional theory developed by Scott and Christensen (1995) helps us to understand the factors that influence the adoption of inter-organizational systems (IOSs); it postulates that mimetic, coercive, and normative institutional pressures existing in an institutionalized environment may influence the organization’s predisposition toward an IT-based inter-organizational system.

With increasing business complexity, Kenyan commercial banks are seeking innovative business models and specialized technologies to cater for customer demands (Khera, 2006). Cloud computing technology provides the banks with a competitive advantage through cost reductions, simplified maintenance and management of applications across the enterprise, greatly extended scalability, agility, high availability, automation, large data storages and reliable backup mechanisms. Ellison (2010) asserts that through cost reduction, Kenyan commercial banks can avoid purchasing costly infrastructure by outsourcing infrastructure to a third-party and manage all of their data and applications from a simple Web address on the Internet. According to Khera (2006), cloud strategy scalability and flexibility has the potential to enable Kenyan commercial banks to pay for only what they need in terms of resources and capabilities. Therefore, these banks need to focus on the improvement of their core operations through
adoption and implementation of cloud computing infrastructure. It is on this backdrop that this study focused on the implementation of cloud computing strategy by Commercial Banks in Kenya.

1.1.1 Strategy implementation

Strategy implementation is an essential component of strategic management process. It is a process that turns a formulated strategy into actions, which makes sure that the vision, mission, strategy and strategic objectives of the organization are successfully achieved as originally laid out (Scott & Lane, 2000). Zeps & Ribickis (2015) also define strategy implementation as the manner in which an organization should develop, utilize, and amalgamate organizational structure, control systems, and culture to follow strategies that lead to competitive advantage and a better performance. Organizational structure allocates special value developing tasks and roles to the employees and states how these tasks and roles can be correlated so as maximize efficiency, quality, and customer satisfaction-the pillars of competitive advantage.

Cloud computing as a recent strategy that boosts the quality of banking services needs to be implemented via the application of appropriate practices that would ensure that organizational goals are met. According to Thompson and Strickland (2003), poor and inadequate implementation undermines a strategy’s potential and paves the way for shortfalls in organizational performance. Among all activities that managers do, there is nothing that affects a company’s ultimate success or failure more than how well the management team sets the company’s long term direction, develops competitively effective strategic and business approaches and implements them to produce the expected results (Zeps & Ribickis, 2015).

Most importantly, the implementation of cloud computing strategy plays a key role in the bank’s efforts to transform its business and operating model (Wang, von Laszewski & Younge, 2010). From a technical viewpoint, the cloud strategy automatically assembles, integrates and configures technology resources to meet business goals. In business terms, it eliminates the need for a physical infrastructure to be present at each location from where the bank operates, thus making it easier for the bank to deploy services rapidly and at a lesser cost (Horrigan, 2008). This implies that; when the best methods of cloud computing strategy implementation are
practiced in commercial banks, there is an assurance that the strategy can produce its originally associated outcomes, including efficiency and business agility.

1.1.2 Cloud computing strategy

Cloud computing entails the application of basic technology that is used to access different services on the Internet using the “cloud”. The implementation of this strategy demonstrates the utilization of a technology model in which any and all resources application software, processing power, data storage, backup facilities, development tools literally, everything is delivered as a set of services via the Internet” (Tambe & Hitt, 2013). Therefore, the cloud computing strategy then introduces an approach to move the Banks from the current state of a duplicative, cumbersome, and costly set of application silos to end to end state which is agile, secure, and cost effective service environment that can rapidly respond to changing IT needs. This will help the organizations creates competitive advantage by giving companies new ways to outperform their rivals (Chin-Nung, I-Liang, & Yan-Kai, 2011).

A cloud computing strategy helps aligns the interest of business and IT executives in addressing fundamental cloud questions such as what should be included in a roadmap and how much budget is required to attain this, for example, when is cloud necessary for an organization and when it is not necessary (Pearlson & Saunders, 2009). Most importantly, cloud computing strategy provides three primary sources of business value: efficiency, agility, and innovation. Moreover, the cloud computing strategy enables banks and financial institutions to transform their business processes and grow organically in new sectors and geographies without incurring huge costs for establishing a physical presence. With proper implementation of cloud computing strategy an organization is able to create new markets and services for the banks for the customers and gain a competitive edge (Wang, von Laszewski & Younge, 2010). The strategy also helps in identifying and creating significant opportunities that helps banks to develop new business models that are customer-centric, thereby increasing growth and profitability. Therefore, implementation of cloud computing strategy has the ability to tremendously change the stakes for entrepreneurs, small and large businesses, researchers and the government (Tan & Lin, 2012). This explains the need for commercial banks in Kenya to implement the cloud computing strategy so as to have a clear roadmap.
1.1.3 Commercial banking sector in Kenya

The banking industry in Kenya is governed by the Companies Act Chapter 486 of the laws of Kenya, the Banking Act, the Central Bank of Kenya Act Chapter 491 and the various prudential guidelines issued by the Central Bank of Kenya (CBK). The banking sector was liberalized in 1995 and exchange controls lifted. The CBK, which falls under the Minister for Finance docket, is responsible for formulating and implementing monetary policies and fostering the liquidity, solvency and proper functioning of the financial system (Njoroge, 2010).

According to the Central bank of Kenya, there are 43 registered commercial banks in Kenya as at May, 2014. These banks can be categorized into locally owned and foreign owned. Locally owned banks are further categorized into public financial institutions and private financial institutions. Commercial banks in Kenya offer several services to their customers such as personal loans, mortgage loans, credit cards, finance, savings accounts, current accounts, foreign exchange and share trading among others. Since they offer similar services, high competition has been stirred in the banking industry. Due to this, Banking institutions have been forced to upgrade their service levels and the way they deliver services to customers. This has made banks implement new technologies. One of the strategies that can be implemented to help banks concentrate on their core business is Cloud Computing Technology. With cloud computing strategy, banks are able to concentrate their efforts in their core functions hence resulting into a reduction of the expense required to support services such as servers, storage and application, hence; the need for the implementation of cloud computing strategy in the Kenyan commercial banks.

1.2 Research Problem

The banking industry, like any other service industry, faces a dynamic market, new technologies, economic uncertainties, fierce competition and more demanding customers. Information Technology has become a strategic asset for companies around the world, increasing competitiveness and shaping business operations from finance and logistics to customer relations and human resources. Cloud computing strategy offers Kenya’s commercial banks greater flexibility in terms of capacity, agility and costs, yet most banks are still reluctant to embrace and implement cloud strategy. The emerging trend is deployment of non-core applications such as
emails and so forth. Issues like insecurity, lack of a clear value proposition, lack of standardization, inadequate funding and managing complexity are as well major barriers to implementation of cloud computing strategy in commercial banks.

According to Chin-Nung et al., (2011), there are some challenges associated with cloud computing strategy implementation in the commercial banking sector in Kenya that include the fact that implementation may take longer than anticipated, insufficient coordination within the organization, and other matters that arise, taking resources away from the implementation phase. Sometimes there are also insufficient capabilities of the management and employees to implement strategies, in addition to lack of training for management and employees in order to implement the strategies. Additionally, the majority of the Kenyan commercial banks are faced with problems of insecurity and fear that their privacy may be interfered with, which leads the management of these banks to lack enough confidence in the cloud computing strategy implementation and use. For the commercial banks in Kenya to implement the strategy, the management must be aware of it, ready to implement it and have a positive attitude on it (Wangui, 2011).

Some studies have been carried out focusing on cloud computing strategy usage by organizations. For example, Gubala’s (2011) study on cloud computing strategy in United States showed that significant security concerns continue to deter many firms from putting their data and core processes in the cloud, thus raising a concern whether banks are willing to implement cloud strategy within their system. Wangui (2011) focused on adoptability of cloud computing by the banking sector and found out that banks had awareness regarding cloud computing as well as its advantages but were hesitant to adopt it because of what the study speech marked as security concerns as well as lack of appropriate knowledge on models of technology adoption.

Although a number of studies have been conducted focusing on the usage of cloud computing as a key strategy in organizations, no in-depth study has been conducted on how the cloud computing has been implemented in the Kenyan commercial banks. Therefore, this study aimed at closing the existing knowledge gap by seeking to establish the implementation of cloud computing strategy by Commercial Banks in Kenya. This study was conducted with key ideas in mind, including; which factors affect the implementation of cloud computing strategy in
commercial banks in Kenya, what are the benefits of implementation of cloud computing and what challenges do commercial banks face while implementing cloud computing strategy?

1.3 Objectives of the study

The research objectives of this study included;

i. To establish the factors influencing the implementation of cloud computing strategy by Commercial Banks in Kenya.

ii. To establish the major benefits of implementation of cloud computing strategy by Commercial Banks in Kenya.

iii. To find out the challenges facing the implementation of cloud computing strategy by Commercial Banks in Kenya.

1.5 Value of the study

A study on implementation of cloud computing strategy by commercial banks in Kenya is important to the cloud computing users and other stakeholders in one way or another. First, the study will be useful to the commercial banks in Kenya, particularly the management, as it will create an insight on factors influencing the implementation of cloud computing. Also, the management of the banks will be made aware of the challenges facing the implementation of the cloud, a knowledge that they can use to counter these challenges by coming up with the best practices for cloud computing strategy implementation.

Additionally, researchers and scholars may use the findings that were generated in this study as a point of reference for future research related cloud computing implementation.

Further, cloud computing vendors and service providers will benefit from this study as they will use it to evaluate customers’ concerns and factors hindering them from adopting and implementing cloud technology. They will therefore be able to come up with a plan to address the concerns and hence help customers implement the cloud technology to a greater extent.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature on the implementation of cloud computing strategy by commercial banks in Kenya. The chapter begins with a review of the theoretical foundation, followed by the empirical review of the factors influencing cloud computing implementation, benefits of the cloud as well as the challenges facing cloud implementation, and finally the conceptual framework.

2.2 Theoretical foundation

This section discusses theories that will guide the researcher in determining the variables to be measured and statistical relationships to be worked on. In this section, the researcher discusses three theories which include; Diffusion on innovation (DOI) theory, the technology, organization, and environment (TOE) framework and Institutional theory.

2.2.1 Diffusion of innovation theory

The Diffusion on innovation (DOI) theory was developed by Rogers in 1995. DOI is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. DOI theory sees innovations as being communicated through certain channels over time and within a particular social system.

This theory is appropriate for this study as it explains that individuals are seen as possessing different degrees of willingness to adopt innovations, and thus it is generally observed that the
portion of the population adopting an innovation is approximately normally distributed over time, thus the differences observed in cloud computing strategy implementation in Kenyan Banks. Breaking this normal distribution into segments leads to the segregation of individuals into the following five categories of individual innovativeness (from earliest to latest adopters): innovators, early adopters, early majority, late majority, laggards (Rogers, 1995).

The innovation process in organizations is much more complex. It generally involves a number of individuals, perhaps including both supporters and opponents of the new idea, each of whom plays a role in the innovation-decision. complexity is the degree to which an organization’s members possess a relatively high level of knowledge and expertise”; “formalization is the degree to which an organization emphasizes its members’ following rules and procedures”; “interconnectedness is the degree to which the units in a social system are linked by interpersonal networks”; “organizational slack is the degree to which uncommitted resources are available to an organization”; “size is the number of employees of the organization”.

However, based on DOI theory at firm level, innovativeness is related to such independent variables as individual (leader) characteristics, internal organizational structural characteristics, and external characteristics of the organization. (a) Individual characteristics describe the leader attitude toward change. (b) Internal characteristics of organizational structure include observations according to Rogers (1995) whereby: “centralization is the degree to which power and control in a system are concentrated in the hands of a relatively few individuals. This addresses its limitation because it does not completely address the factors that influence the implementation of a technology in an organization, thus; has to be complemented by other theories.
2.2.2 The technology, organization, and environment framework

The TOE framework was developed in 1990 (Tornatzky and Fleischer 1990). It identifies three aspects of an enterprise’s context that influence the process by which it adopts and implements a technological innovation: technological context, organizational context, and environmental context. (a) Technological context describes both the internal and external technologies relevant to the firm. This includes current practices and equipment internal to the firm, as well as the set of available technologies external to the firm. (b) Organizational context refers to descriptive measures about the organization such as scope, size, and managerial structure. (c) Environmental context is the arena in which a firm conducts its business—its industry, competitors, and dealings with the government (Tornatzky and Fleischer 1990).

The TOE framework as originally presented, and later adapted in IT adoption studies, provides a useful analytical framework that can be used for studying the adoption and assimilation of different types of IT innovation. The TOE framework has a solid theoretical basis, consistent empirical support, and the potential of application to IS innovation domains, though specific factors identified within the three contexts may vary across different studies (Tornatzky and Fleischer 1990). However, this theory only discusses a framework for studying how cloud computing strategy can be implemented in organizations, but does not provide knowledge on benefit of cloud technology implementation in organizations, thus; the need for other theories to be reviewed in this study.

2.2.3 Institutional theory

Institutional theory was developed by Scott and Christensen in 1995. Institutional theory emphasizes that institutional environments are crucial in shaping organizational structure and
actions. According to the institutional theory, organizational decisions are not driven purely by rational goals of efficiency, but also by social and cultural factors and concerns for legitimacy. Institutions are transported by cultures, structures, and routines and operate at multiple levels. The theory claims that firms become more similar due to isomorphic pressures and pressures for legitimacy (Dimaggio and Powell 1983). This means that firms in the same field tend to become homologous over time, as competitive and customer pressures motivate them to copy industry leaders. For example, rather than making a purely internally driven decision to adopt e-commerce, firms are likely to be induced to adopt and use e-commerce by external isomorphic pressures from competitors, trading partners, customers, and government.

This theory is important in this study because it uses an institutional approach to e-commerce and innovations’ assimilation. It is well known that mimetic, coercive, and normative institutional pressures existing in an institutionalized environment may influence organizations’ predisposition toward an IT-based inter-organizational system. Mimetic pressures are observed when firms adopt a practice or innovation imitating competitors. Coercive pressures are a set of formal or informal forces exerted on organizations by other organizations upon which the former organizations depend (Dimaggio and Powell 1983). Normative pressures come from dyadic relationships where companies share some information, rules, and norms. Sharing these norms through relational channels amongst members of a network facilitates consensus, which, in turn, increases the strength of these norms and their potential influence on organizational behaviour (Powell and DiMaggio, 1991). However, though this theory addresses factors influencing innovations assimilation, it does not explain how an innovation like cloud computing strategy can be done, hence; the need for more theories to be reviewed in this study.
2.3 Factors influencing cloud computing strategy

Feuerlicht (2010) conducted a study on the factors influencing cloud computing implementation and found that the security and privacy, identity management standards, and the need for sharing and collaboration in today’s highly competitive world have a positive effect on using and adopting cloud computing. In fact, a data breach is a security incident in which a company or a government agency loses sensitive, protected or confidential data. Cloud computing strategy entails storing data and computing in a shared multi-user environment, which increases security concerns. Privacy-enhancing techniques, monitoring mechanisms, authentication, encryption, and the security of data in the cloud environment are good ways to enhance cloud security and minimize risk (PRWEB, 2012). There are a number of factors that influence the implementation of cloud computing, some of which are discussed below.

Cost is a very important factor for consideration in the process of implementation of cloud computing strategy. "Cost advantages are the strongest driver affecting IT executives' perceptions of SaaS opportunities. Feuerlicht (2010) stated that companies need to spend a big part of their balance on the IT infrastructure, while less than 10 % of their servers can be really utilized, resulting in a big waste of money. In addition, these servers need to be replaced almost every three years and need to be maintained and administrated, increasing the total cost of IT operations radically. Therefore, Cloud Computing as a strategy being implemented by banks can reduce these costs remarkably. Economies of scale for datacenters cost savings can lead to a five to seven-time reduction in the total cost of computing activities.

Furthermore, cloud computing reduces the cost of entry into the market for small companies and developing countries. By implementing cloud computing strategy solutions, small companies can
use expensive business analytic software, which require high level of IT infrastructure to enhance their business at relatively low cost, while this kind of applications was available only for large companies or enterprises before (Carriedo & Beltran, 2015).

Additionally, reliability should be greatly considered in cloud computing strategy implementation. An outage is the absence of the cloud service. An outage is unavoidable and users should take it into account before implementing such a strategic solution. It might happen for a short or a long time, a few or many times. Even large companies such as Google and Amazon experienced many similar cases in the past and they will have many more in the future. In short, 100% availability of the service is impossible.

Most of the applications hosted in the cloud strategy are currently non-critical such as back up and software testing. Moreover, users implementing cloud computing strategy should make sure to have backup of their data in other places. Nowadays, the providers of cloud computing strategy are trying to avoid outage and promise a high level of availability in the Service-Level Agreement (SLA) and try to compensate their users in the case of an outage of the service. This factor represents a risk and it is one of the effective factors in cloud computing strategy implementation. It will determine the kind of applications that can be used in the cloud computing strategy along with its implementation.

Security issues are another important factor that influences the implementation of the strategy of cloud computing. The implementers of cloud strategy give the cloud providers full control over their data and they should trust that this third party will take care of their business, secure the data, and do backups for them. This issue can be partly solved by Service-Level Agreements (SLA), where the conditions of security issues in the contract will be clarified. The security issue
is one of the biggest doubts when users think about implementing the cloud computing strategy as the users do not have their own data in their companies anymore. Almost 75 percent of IT executives and CIOs report that security is their primary concern (Eagly, & Chaiken, 2013).

Also, the performance issues relating to the implementation of cloud computing strategy need to be considered during. The main source of performance problems come from the connection quality between the user and the cloud computing server, mainly when more users are connecting at the same time and large amounts of data are transferred between the end user and the cloud server. This results in a slowdown in the cloud service. The performance issue is an important factor which companies have to think about when implementing cloud computing. Companies should measure their possible current and future bandwidth and processing requirements before they decide to adopt cloud solutions. Performance is seen as one of the main risks, and an important opportunity at the same time (Goutas, Sutanto, & Aldarbesti, 2016).

Further, Scalability is an important factor that should be taken into account in terms of performance. As the requirements of the cloud computing implementers increase, the cloud provider should be able to scale up their resources and infrastructure to satisfy the implementer's new requirements of storage, processing, and connection bandwidth. On the other hand, scalability in Cloud Computing is one of the main strength points and constitutes an important opportunity for companies. As these companies' requirements change, their infrastructure will be scaled up or down dynamically providing a high level of strategic flexibility (PRWEB, 2012).

Moreover, the Compliance and physical Location of the cloud should be put into consideration. Since Cloud Computing is a fairly young technology, no rules and governmental regulations really exist to set the boundaries and laws regarding the storage of data by enterprises on third-
party computing facilities that are shared with others. Moreover, some old regulations already exist concerning the enterprise data privacy, access, and location without taking Cloud Computing into account, and these regulations might be violated by Cloud Solutions. For instance, while many countries have regulations concerning the physical location of enterprise data, the cloud providers cannot guarantee the exact physical location of the data, and even some of them have policies to hide such kind of information from the end user. However, some companies are now trying to solve this issue and comply with the local regulations. For example, Amazon Web Services (AWS) has started a new service called the Amazon Virtual Private Cloud which allows users to connect their own infrastructure to AWS computing resources.

As well, cloud computing implementers need to take into account its integration with other services. Companies need to adopt different types of applications from different cloud providers and these applications might need to interact with each other. At the same time, some companies might adopt a hybrid strategy of Cloud Solutions as public clouds have different characteristics from that of private clouds. Consequently, the integration between the data from these different applications needs to be achieved and this issue poses many technical and business challenges for cloud providers and adopters. On the other hand, Mashups can be a real opportunity in cloud solutions. Mashups are a web service providing data or functionality relying on different external sources (Feuerlicht, 2010).

Lastly, cloud computing implementation process should have in mind other environmental issues, which constitute a real concern for companies in this era as more regulations are issued to minimize the carbon footprint organizations leave behind. Efficient use of energy and recycling IT resources are important issues that should be handled properly and these factors constitute the main element of green IT. By changing the IT functionality into the cloud, companies not only
reduce their IT infrastructure but also use the energy in an intelligent way. However, other researchers suggest that cloud servers are consuming a huge amount of energy and not all cloud providers are following the best standards in energy efficient consumption, consequently, moving to the cloud does not reduce the global CO2 emissions necessarily. Moving to the cloud can reduce the IT infrastructure by sharing with others and cloud providers can follow best standards in energy efficient consumption which might not be possible for the small companies as a result of the economy scale, but implementers of Cloud Computing should make sure that these providers are applying these environmental standards before adopting their solutions (Feuerlicht, 2010).

2.4 Benefits of cloud computing strategy

Horrigan (2008) carried out a study to examine the main benefits of cloud computing strategy. The study revealed that there are six main benefits, the first one is lower costs: cloud computing strategy has the ability to pool all of the computing resources that can be distributed to applications as needed, optimizing the use of the sum of the computing resources and delivering better efficiency and utilization of the entire shared infrastructure. The second benefit is reduced capital expenditure: whether an organization chooses a public cloud strategy or outsourced private cloud computing strategy option, cloud computing delivers a better cash flow by eliminating the capital expense associated with building the server infrastructure (Wang, von Laszewski & Younge, 2010).

The third benefit is that cloud computing strategy implementation enables faster deployment of projects; this is because servers can be brought up and deployed in a matter of minutes ensuring that the time to deploy a new application drops dramatically with cloud computing strategy. Rather than installing and networking a new hardware server, the new server can be dialed up
and imaged in through a self-serve control console (Youseff, Butrico and Da Silva, 2008). The fourth benefit of cloud computing strategy implementation is the ability to “Scale as Needed”. As applications grow, an organization can add storage, RAM and CPU capacity as needed, meaning that they can buy just enough and scale as the application demands grow. The fifth benefit accruing from cloud computing strategy is lower maintenance costs. This is driven by two factors; less hardware and outsourced, shared information technology staff. Cloud computing strategy entails the use of less physical resources, therefore there is less hardware to power and maintain. With an outsourced cloud, the organization doesn’t need to keep server, storage, network, and virtualization experts on staff full time. The final benefit is that cloud computing offers resiliency and redundancy. This is because in cloud computing there is automatic failover between hardware platforms and disaster recovery services to bring up servers set up in a separate data centre should the primary data centre experience an outage (Wang, von Laszewski & Younge, 2010).

In order to proof the benefits of cloud computing strategy implementation, provider Mathur & Nishchal (2010) did a study on the same. The study demonstrated an example of an organization that has moved business applications to cloud computing strategy is the largest casino operator in the world, Harrah's Entertainment, which has moved applications such as reservations and their extensive customer loyalty database to a cloud strategy. This cloud computing transition has both advantages and disadvantages. A benefit that is mentioned for Harrah’s cloud computing strategy applications is localized innovation, while one disadvantage is that these applications are provider-specific and would be difficult to migrate to another provider’s platform. Another cloud computing strategy implementation, the Qatar Cloud Computing strategy Initiative, was spearheaded by three universities, namely Carnegie Mellon University in Qatar, Qatar
University, and Texas A & M University at Qatar (Aymerich, Fenu & Surcis, 2008). These universities are joining forces to address local business and industrial computing needs. Some areas of special interest include seismic modeling, gas exploration, and production operations support for the petroleum industry. This initiative also addresses compute intensive and parallel computing applications such as an Arabic language search engine, testing and migrating applications to enable parallel computing using Map Reduce programming, and support of secure computing research.

There also is a demand for the cloud computing strategy to support medical research. The Computational Intelligence Research Group located at the University of Pretoria, South Africa, is using cloud computing strategy for medical research (Aymerich, Fenu & Surcis, 2008). Other groups can benefit from the economy of scale and centralized resources provided by the cloud computing strategy. A software as a service approach could bring needed computing capabilities to impoverished rural and Third-World areas (Pearlson & Saunders, 2009). Also, the Higher Education Alliance enables students at seven universities in East Africa to have access to advanced software, computing resources and educational materials, without the cost of acquiring and maintaining these resources at each site (Aymerich, Fenu & Surcis, 2008).

2.5 Challenges facing cloud computing strategy

Most organizations have concerns around the potential security risks posed by cloud computing strategy implementation in organizations. According to Melvin & Greer (2009), the number one factor stopping Information Technology leaders from tapping into the cloud strategy right away is security worries. Enterprise information is important in an information sharing world and the loss of customers’ private information such as credit card details can be detrimental to a
company. The security of such data especially when stored by a third party is a major concern to companies considering implementing cloud computing.

Lack of privacy is another challenge hindering cloud computing strategy implementation. When an organization uses the cloud computing strategy, data is stored on the provider’s server and not in their own hardware, and therefore, the user lose some control over the data. In addition to the above, Africa is faced by a unique set of challenges. Internet connectivity is still not available in large parts of the continent (Wang, von Laszewski & Younge, 2010). Cloud computing strategy relies on real time server interactions with low latency, high bandwidth, and a stable connection that are largely lacking in most of Africa. This problem is compounded with the lack of cheap computing devices and low computing literacy levels where most people on the continent cannot even perform the most basic functions.

Enterprises need to consider the benefits, drawbacks and the effects of cloud computing strategy on their organizations and usage practices, to make decision about the implementation and use. In the enterprise, the “implementation of cloud computing strategy is as much dependent on the maturity of organizational structure and culture, including legislative processes (Fellowes, 2008). Many companies have implemented the cloud computing strategy by building their public clouds, which include Amazon, Google and Microsoft. These companies are often releasing new features and updates of their services. For instance Amazon Web Services (AWS) released a Security2 and Economics3 centre on their website to have academic and community advice regarding these issues (Khajeh-Hosseini et al., 2010). This shows that there are still lots of doubts about the costs and security for enterprises to implement the cloud computing strategy. Hence, the issues of economics and security in cloud computing strategy for enterprises must be researched.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was utilized for the study. This section presents areas of research design, the target population and sampling method and sample size, data collection procedures and data analysis and presentation.

3.2 Research Design

This study used descriptive survey research design. A descriptive study portrays the variables in a consistent manner by answering who, what, and how questions. Kothari (2004) observes that descriptive research design is a blueprint which facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible hence yielding maximum information with minimal expenditure of effort, time and money. Therefore, descriptive design was preferred than other research designs since it was essential to enable the researcher to report of the characteristics of the phenomena under investigation, and suitably describe phenomena, situations and events relating to the study objectives without changing the information.

3.3 Study Population

The population of interest in this consisted of all the 43 commercial banks operating in Kenya. A census study was conducted since the population was small (Kothari, 2014). Moreover, all banks have their head office in Nairobi, hence; were easily accessible. These respondents were perceived to have relevant information required to achieve the objectives of the study.
3.4 Data collection

In this study, primary data was utilized, which was collected by use of a questionnaire. The targeted respondents were the ICT managers and operations managers. The questionnaires were consisting of both closed ended and open ended type of questions. Close ended questions only allowed specific types of responses such as Yes or No and Likert scales. In the open ended type, the respondents stated responses as they wished. The Additionally, close ended questions were used in an effort to conserve time and money as well as to facilitate an easier analysis as they were in immediate usable form; while the open ended questions were used as they encourage the respondent to give an in-depth and felt response without feeling held back in revealing of any information.

3.5 Data analysis

This study used descriptive statistics for analysis. Once data was collected, it was cleaned and coded into meaningful parameters that were read by the computer for ease of analysis. Quantitative data from close-ended questions and Likert scales) was analyzed by use descriptive statistics with the help of SPSS (Statistical Package for Social Sciences. This was done by tallying up the responses, computing the percentages of variations in response as well as describing and interpreting the data in line with the study objectives and assumptions. Additionally, data collected from the open ended questions (qualitative) was analyzed using qualitative content analysis to establish the expected results.
4.0 Introduction

This chapter discusses the analysis of the data obtained from the targeted respondents, in this case, the ICT managers at the selected 43 Kenya commercial banks. The data collected from the sampled respondents was in regard to the implementation of cloud computing by the commercial banking institutions in Kenya. The chapter therefore presents the background information of the respondents as well as a comprehensive analysis based on the specific objectives of the study. The study adopted descriptive statistics for analysis. The collected quantitative data was cleaned and coded in SPSS to give meaningful parameters that were used in analysis. Additionally, qualitative data was analyzed using qualitative content analysis to establish the expected results.

4.1 Response rate

A total of 43 commercial banks in Kenya were selected and were sampled systematically, from which data was collected by the use of a structured questionnaire. The questionnaires were distributed to the banks, and the respondents were given time to answer the questions at their comfort, after which they were collected after completion. Out of the 43 questionnaires distributed, 33 were fully completed. 7 of questionnaires were discarded after the bank representatives reported that they were not able to complete the questionnaires, while 3 were not fully completed, had missing fields. Hence; a total of 33 questionnaires were utilized in the analysis, while the 7 were reported as non-response cases and the 3 as missing fields (n=33). A response rate of 77% was acquired as follows;
Table 4.1 Response rate

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed/Valid questionnaires</td>
<td>33</td>
<td>77</td>
</tr>
<tr>
<td>Missing fields</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Non-response</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source; Research, 2016

4.2 General characteristics of the respondents

4.2.1 Respondents’ experience

The study sought to establish the level of experience of the respondents in their respective institutions, in regard to the number of years they had worked in the respective institutions. The findings of the study were as in the table below.

Table 4.2: Respondents years of experience

<table>
<thead>
<tr>
<th>Years of experience</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10 Years</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>10-30 Years</td>
<td>16</td>
<td>49</td>
</tr>
<tr>
<td>31-40 Years</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Over 40 Years</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source; Research, 2016

According to the study findings, the study found that the most of the respondents’ experience was between 10 and 30 years as shown by 49%. 36% of the respondents had an experience of
below 10 years in their banks, 9% represented respondents who had an experience of between 31 years and 40 years, while the rest as shown by 6% had an experience of over 40 years respectively. This has the implication that the range of experience of the majority of the respondents reached at the time of the study was appropriate, and all experience ranges that are likely to be in a working environment were appropriately represented. This means that the targeted people were in a position to provide the information needed for the study.

4.2.2 Level of education

The study sought to establish the highest level of education that the selected respondents had attained. According to the findings, the study found out that most of respondents reached at the study time were graduate (degree holders) as shown by 52% of the respondents, 42% were post graduate holders, while 6% were diploma holders respectively. This shows that majority of the respondents who participated in the study, and those who gave back completed and valid questionnaires had at least a degree qualification and could give relevant and reliable information on the subject matter. This corresponds appropriately to the high response rate that was obtained during the study, where most of the questionnaires were completed as shown above. The research findings were as in table 3 below;

Table 4.3: Respondents’ highest level of education

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Frequency (n=33)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diploma</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Graduate</td>
<td>17</td>
<td>52</td>
</tr>
<tr>
<td>Post graduate</td>
<td>14</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Research, 2016
4.2.3 Respondents designation

The study sought to establish the designation of the respondents in their respective commercial banks. The findings of the study were as in Figure 4.1 below;

**Figure 4.1: Respondents Designation**

![Respondents designation chart]

**Source: Research 2016**

From figure 1 above, the study findings indicated that the majority of the participants of the study were the IT managers, who were represented by 37% of the targeted respondents, 27% represented others who included the operations managers, credit managers etc. Also, 21% of the respondents were the strategic implementation specialists, while the bank managers were represented by the 15% of the respondent. The findings indicated that the respondents reached were well distributed as originally targeted by the researcher, therefore, the information needed for the study was obtained from all categories; hence; more reliable information was acquired.

4.2.4 Strongest area of business

The study sort to establish the department in the bank which cloud computing has been strongly adopted. The findings of the study were as illustrated in the figure 4.2 below,
Figure 4.2: Strength of application

<table>
<thead>
<tr>
<th></th>
<th>Mobile banking</th>
<th>Corporate and investment</th>
<th>Loans and mortgages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Series1</strong></td>
<td>37%</td>
<td>34%</td>
<td>29%</td>
</tr>
</tbody>
</table>

**Source: Research, 2016**

From the findings shown above, the majority of the respondents represented by 37% shown that cloud computing is mainly applied in the mobile banking, 34% represented that cloud computing is strongly applied in the corporate and investment department while 29% represented that cloud computing is strongly applied in loans and mortgage departments. This has the implication that cloud computing have been adopted in various departments in almost the same measure. In this regard therefore cloud computing have been embraced in banking sector.

**4.2.5 Banks’ ownership**

The study was carried out with an intention of investigating into the extent of local ownership of the Kenyan commercial banks. The study findings are as in the figure below;
According to the findings, the majority of the respondents indicated that local shareholding in the Kenyan commercial bank is more than 50% as represented by 61% of the respondents while only 39% of the respondents indicated that local shareholding of the Kenyan commercial banks is less than 50%. This implies that shareholding in Kenyan commercial bank is dominated by local citizens. In this regard it shows that implementing cloud computing in bank’s operations is mainly influenced by local market dynamics.

4.3 Cloud computing strategy implementation

4.3.1 Strategy implementation

The study was designed to investigate whether Kenyan commercial banks have adopted cloud computing as a strategy to be implemented in order to improve their operations. The study findings were as shown in the figure 4.4 below;
According to the findings, the majority of the respondents represented by 95% indicated that their banks have implemented cloud computing in their operations while 5% indicated that their bank institutions are yet to implement cloud computing in carrying out their operations. This has the implication that most of the commercial banking institutions in Kenyan have implemented cloud computing as a strategy aimed at improving their operations as well as their performance.

Additionally, on the implementation of cloud computing as a strategy in the commercial banks, the study also sought to determine the level of satisfaction that the cloud computing has given the targeted commercial banking institutions. The findings are as illustrated in the table below;
Table 4.4: Level of satisfaction

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency (n=33)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>17</td>
<td>51</td>
</tr>
<tr>
<td>satisfied</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>Neutral</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very dissatisfied</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source; Research, 2016

From the table above, the findings of the study indicated that the targeted banking institutions were very satisfied with cloud computing as a strategy that has been implemented to assist in the daily banks’ operations as shown by 51%. 34% of the targeted respondents indicated that they were satisfied with cloud computing strategy, while 15% of the respondents were neutral about their level of satisfaction with the cloud computing strategy. The level of satisfaction provides evidence that cloud computing has been embraced as an important strategy in the Kenyan commercial banks, hence; the high rates at which it is being implemented.

4.3.2 Value addition

The study was aimed at finding out the extent to which cloud computing strategy implementation adds value to the Kenyan commercial banks. The findings of the study were presented in the table below;
Table 4.5: Cloud computing value addition

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency (n=33)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>11</td>
<td>33</td>
</tr>
<tr>
<td>Great extent</td>
<td>14</td>
<td>43</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Little extent</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Not at all</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source; Research, 2016

From the study findings, it was evident that the majority of the respondents who participated in the study reported that cloud computing as a strategy implemented in the commercial banks added value to their operations to a great extent as shown by 43%. Additionally, some of the respondents at a rate of 33% indicated that cloud computing strategy added value to their banks to a very great extent as shown by 33%. 12% of the respondents indicated that cloud computing strategy added value to their banks to a moderate extent, 9% indicated that cloud computing strategy added value to the banks to little extent, while only 3% indicated that the cloud strategy did not add any value to the commercial banks. These findings imply that the cloud computing strategy is very important to the Kenyan commercial banks, hence; prompting its implementation in these banks. These findings also concur with those of a study done by Wang, von Laszewski & Younge (2010), which revealed that cloud computing strategy provides three primary sources of business value: efficiency, agility, and innovation. Moreover, the cloud computing strategy enables banks and financial institutions to transform their business processes and grow
organically in new sectors and geographies without incurring huge costs for establishing a physical presence. Wang, von Laszewski & Younge (2010) also revealed that with proper implementation of cloud computing strategy an organization is able to create new markets and services for the banks for the customers and gain a competitive edge, just as this study confirmed.

4.3.3 Existing status gap

The study as well intended to establish from the respondents whether they had identified any gaps that exist between the current ‘as is’ state and the desired ‘to be’ state to be able to come up with more improved solutions. From the study findings, the majority of the respondents stated that there existed a gap current ‘as is’ state and the desired ‘to be’ state to be able to come up with more improved solutions. The existence of the gap shows that though cloud computing strategy is being implemented, and has been implemented in the past, it has some challenges that the banking institutions face. This implies that the desired ‘to be’ state needs the strategy to be improved in the future so that the level of satisfaction to the commercial banks can be improved.

4.4 Factors influencing the implementation of cloud computing strategy

4.4.1 Factors

The study wished to find out from the respondents if there are factors that their respective banks considered when implementing cloud computing as a strategy. The majority of the respondents indicated that there are factors that influenced the implementation cloud computing as a strategy in their respective banks as shown by 95%. The findings of the study were as in the figure below;
4.4.2 Factors influencing the cloud strategy

The study sought to find out the factors influencing the implementation of cloud computing strategy in the Kenyan commercial banks. On this, the researcher provided the respondents with various factors on a scale, from which they were to select depending on which factors each respondent considered important as it influences cloud computing strategy implementation.

From the study findings, it was evident that the majority of the respondents indicated that scalability is an important factor that influences the implementation of cloud computing in the Kenyan commercial banks to a very great extent as shown by a mean of 4.233. In addition, respondents agreed to a very great extent that the factors that influence cloud computing strategy implementation include security (mean = 4.117) market dynamics (mean = 4.113), performance (mean = 4.068), reliability (mean = 4.0.35) and cost (mean = 4.011). Also, respondents agreed to a great extent that the factors that influence cloud computing strategy implementation include compliance (mean = 3.986), integration with other services (mean = 3.876) and environmental issues (mean = 3.768). On the other hand, internal organization politics were not recognized as a
factor that influences the implementation of cloud computing in the Kenyan commercial banks (mean = 2.134) These findings of the study concur with those of a study conducted by Feuerlicht (2010) that found out that the security and privacy, identity management standards, and the need for sharing and collaboration in today’s highly competitive world have a positive effect on using and adopting cloud computing.. The findings of the study were as in the table below;

Table 4.6: Factors influencing cloud computing strategy implementation in bank

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalability</td>
<td>4.233</td>
<td>0.1245</td>
</tr>
<tr>
<td>Security</td>
<td>4.117</td>
<td>0.5514</td>
</tr>
<tr>
<td>Market dynamics</td>
<td>4.113</td>
<td>0.4621</td>
</tr>
<tr>
<td>Performance</td>
<td>4.068</td>
<td>0.3127</td>
</tr>
<tr>
<td>Reliability</td>
<td>4.035</td>
<td>0.8526</td>
</tr>
<tr>
<td>Integration with other services</td>
<td>3.876</td>
<td>0.4561</td>
</tr>
<tr>
<td>Cost</td>
<td>4.011</td>
<td>0.2164</td>
</tr>
<tr>
<td>Compliance</td>
<td>3.986</td>
<td>0.2164</td>
</tr>
<tr>
<td>Environmental issues</td>
<td>3.768</td>
<td>0.2614</td>
</tr>
<tr>
<td>Internal Organization Politics</td>
<td>2.134</td>
<td>0.9641</td>
</tr>
</tbody>
</table>

Source; Research, 2016

4.4.3 Other factors

The study requested the respondents to explain any other factors that their banks may have considered when implementing the cloud computing strategy. The researcher tallied the most important and common responses, and from the findings of the study, the majority of the
respondents stated that they considered accessibility to the banking services by customers as a major factor that they took into consideration when implementing cloud computing strategy. Some respondents also stated that the recent technological developments influenced the implementation of cloud computing in the Kenyan commercial banks. Others indicated that innovation was a major factor to be considered when implementing the cloud computing strategy. These findings of the study concur with those of a study conducted by Feuerlicht (2010) that found out that the security and privacy, identity management standards, and the need for sharing and collaboration in today’s highly competitive world have a positive effect on using and adopting cloud computing.

4.5 Benefits of implementation of cloud computing strategy

4.5.1 Benefits

The study sought to establish whether there were any benefits that the respondents had got from the cloud computing strategy usage in their banks. According to the findings of the study, the majority of the respondents agreed that there are benefits associated with the implementation of cloud computing in their respective banks as shown by 93% in the figure below;
The study sought to establish the benefits of implementation of cloud computing. To establish this, the researchers provided the respondents with various tallied options, from which they were expected to select their best choices of the benefits that their banks were accruing from implementing the cloud computing strategy. From the table below; the study findings showed that the majority of the respondents strongly agreed that the implementation of cloud computing strategy improves the quality of the work (mean=4.346), cloud computing strategy enhances organizational planning and reliability (mean=4.243), the implementation process of cloud computing involves a negligible amount of time and effort (mean=4.176), and that the utilization of cloud computing strategy enables us accomplish tasks more quickly (mean=4.014). Also, the study findings showed that respondents agreed that cloud computing strategy helps the business to align with IT in terms of strategic thinking (mean=3.967), cloud computing implementation
organization is able to lower costs (mean=3.901), and that cloud computing strategy implementation enables the business to align with the IT teams to meet business goals (mean=3.872). Further, the study findings showed that respondents indicated their agreement with the statements that the usage of cloud computing strategy reduced capital expenditure (mean=3.846), cloud computing strategy implementation enables business agility (mean=3.841), organizations will be able to pay as they use i.e. Pay for what they use (mean=3.839), and that implementing cloud computing strategy can help transform organizations peoples processes and systems to futuristic thinking (mean=3.827). Moreover, the findings of this study showed that the organizations will be able to save on human resource, power and storage space if the management adopts this initiative (mean=3.811) and that the overall cost of using cloud computing strategy is less than the cost of installing or developing a technology in house (mean=3.804). These findings concurred with Horrigan (2008), who carried out a study to examine the main benefits of cloud computing strategy, which revealed that there are six main benefits, the first one is lower costs: cloud computing strategy has the ability to pool all of the computing resources that can be distributed to applications as needed, optimizing the use of the sum of the computing resources and delivering better efficiency and utilization of the entire shared infrastructure. According to Horrigan (2008), the second benefit is reduced capital expenditure: whether an organization chooses a public cloud strategy or outsourced private cloud computing strategy option, cloud computing delivers a better cash flow by eliminating the capital expense associated with building the server infrastructure. The findings of the study were as shown in the table below;
<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The implementation of cloud computing strategy improves the quality of the work</td>
<td>4.346</td>
<td>.7954</td>
</tr>
<tr>
<td>Cloud computing strategy enhances organizational planning and reliability</td>
<td>4.243</td>
<td>.9754</td>
</tr>
<tr>
<td>The implementation process of cloud computing involves a negligible amount of time and effort</td>
<td>4.176</td>
<td>.2144</td>
</tr>
<tr>
<td>The utilization of cloud computing strategy enables us accomplish tasks more quickly</td>
<td>4.014</td>
<td>.9852</td>
</tr>
<tr>
<td>Cloud computing strategy helps the business to align with IT in terms of strategic thinking</td>
<td>3.967</td>
<td>.2568</td>
</tr>
<tr>
<td>Cloud computing implementation organization is able to lower costs</td>
<td>3.901</td>
<td>.2614</td>
</tr>
<tr>
<td>Cloud computing strategy implementation enables the business to align with the IT teams to meet business goal</td>
<td>3.872</td>
<td>.5682</td>
</tr>
<tr>
<td>Usage of cloud computing strategy reduced capital expenditure</td>
<td>3.846</td>
<td>.2693</td>
</tr>
<tr>
<td>Cloud computing strategy implementation enables business agility</td>
<td>3.841</td>
<td>.6855</td>
</tr>
<tr>
<td>Organizations will be able to pay as they use ie Pay for what they use</td>
<td>3.839</td>
<td>.5426</td>
</tr>
<tr>
<td>Implementing cloud computing strategy can help transform</td>
<td>3.827</td>
<td>.2689</td>
</tr>
</tbody>
</table>
organizations peoples processes and systems to futuristic thinking

Organizations will be able to save on human resource, power 3.811 .6853 and storage space if management adopts this initiative

The overall cost of using cloud computing strategy is less than 3.804 .59431 the cost of installing or developing a technology in house

Source; Research, 2016

4.5.3 Other benefits

The study intended to find out other benefits that the respondents may have enjoyed after the implementation and use of cloud computing in their respective banks. The researcher tallied the most important responses and reported in this study. According to the findings of the study, the majority of the respondents stated that the implementation of cloud computing strategy leads to a long term benefit, which increased revenue. Some respondents also stated that the cloud strategy leads cost of operations, while others stated that the cloud strategy leads to operations efficiency.

4.6 Challenges facing the implementation of cloud computing strategy

4.6.1 Existence of challenges

The study intended to find out from the respondents whether they knew of any challenges that face the implementation of cloud computing in their respective commercial banks. According to the findings of the study, the majority of the respondents agreed that there are challenges in existence that have hampered the efforts of many banks in the implementation of cloud strategy
as shown by 96% of the tallied responses. The findings of the study were as represented in the figure below;

**Table 4.8: Existence of challenges**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series 1</td>
<td>96%</td>
</tr>
</tbody>
</table>

### 4.6.2 Effects of challenges

As reported in part 4.6.1 above, there are challenges that hinder the implementation of cloud computing in the Kenyan banks. For the respondents that agreed to the existence of challenges, the researcher aimed at establishing how the respondents rated the challenges their banks were facing. According to the findings of the study, the majority of the respondents stated that their banks faced challenges in the process of cloud computing implementation to a great extent as shown by 59%. Some of the respondents also stated that the commercial banks faced strategy implementation challenges to a very great extent as shown by 22%, other respondents indicated that they faced challenges to a moderate extent as shown by 10%, while the rest of the respondents indicated that cloud computing implementation challenges faced by the commercial banks were to a little extent as shown by 9%. These findings concur with those of a study done by Melvin & Greer (2009), which revealed that most organizations have concerns around the
potential security risks posed by cloud computing strategy implementation in their operational framework. The findings of the study were presented in the table below;

Table 4.9: Effects of challenges

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency (n=33)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very great extent</td>
<td>19</td>
<td>59</td>
</tr>
<tr>
<td>Great extent</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>Moderate extent</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Little extent</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Not at all</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source; Research, 2016

4.6.3 Distinguished challenges

The study sought to find out from the participants the extent to which they considered various distinguished challenges of implementation of cloud computing strategy as important in regard to how they affected the implementation of cloud computing by commercial banks in Kenya. According to the findings of the study, respondents strongly agreed that concerns over security of cloud computing strategy were a major challenge facing cloud computing strategy implementation (mean=4.352), difficulty in migrating in and out of the cloud computing strategy and switching providers was a major challenge (mean=4.311), cloud computing strategy providers still lack round-the-clock service resulting in frequency outages (mean=4.311), and that the firm would spend more for the bandwidth than it would on hardware and in-house software (mean=4.281). The findings of the study also showed that respondents agreed that Cloud
computing strategy can expose the firm to data security risks and minimize information privacy (mean=3.989), Resistance to change (mean=3.973), Insufficient leadership attention (mean=3.965), Limited resources of cash to operate cloud computing strategy (mean=3.945), Weak or inappropriate strategy (mean=3.888), Our bank does not trust the uptime or speed of cloud strategy services (mean=3.875), Difficulty in assessing the costs involved due to the on-demand nature of the services (mean=3.863), and that Firms that have adopted the cloud strategy report problems with the system thus the business cannot approve a failed strategy (mean=3.852). These findings showed that the implementation of cloud computing is faced by rampant challenges that need to be addressed. The findings of the study were as in the table below;

Table 4.10: Challenges of implementation of cloud computing strategy

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerns over security of cloud computing strategy</td>
<td>4.352</td>
<td>.8524</td>
</tr>
<tr>
<td>Difficulty in migrating in and out of the cloud computing strategy and switching providers</td>
<td>4.311</td>
<td>.6324</td>
</tr>
<tr>
<td>Cloud computing strategy providers still lack round-the clock service resulting in frequency outages</td>
<td>4.311</td>
<td>.5422</td>
</tr>
<tr>
<td>The firm would spend more for the bandwidth than it would on hardware and in-house software</td>
<td>4.281</td>
<td>.6424</td>
</tr>
<tr>
<td>Cloud computing strategy can expose the firm to data security risks</td>
<td>3.989</td>
<td>.8542</td>
</tr>
<tr>
<td>Our bank does not trust the uptime or speed of cloud strategy services</td>
<td>3.875</td>
<td>.5253</td>
</tr>
<tr>
<td>Difficulty in assessing the costs involved due to the on-demand nature of the services</td>
<td>3.863</td>
<td>.9251</td>
</tr>
<tr>
<td>Limited resources of cash to operate cloud computing strategy</td>
<td>3.945</td>
<td>.4153</td>
</tr>
<tr>
<td>Weak or inappropriate strategy</td>
<td>3.888</td>
<td>.6921</td>
</tr>
<tr>
<td>Insufficient leadership attention</td>
<td>3.965</td>
<td>.8541</td>
</tr>
<tr>
<td>Resistance to change</td>
<td>3.973</td>
<td>.2855</td>
</tr>
<tr>
<td>Firms that have adopted the cloud strategy report problems with the system thus the business cannot approve a failed strategy</td>
<td>3.852</td>
<td>.3485</td>
</tr>
</tbody>
</table>
CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
This chapter presents the summary of the research findings, conclusions, recommendations and suggestion for further studies.

5.2 Summary of findings
This study’s aim was to investigate on the implementation of cloud computing strategy by commercial banks in Kenya. The study focused on four main objectives, which focused on how to establish the factors influencing the implementation of cloud computing strategy by Commercial Banks in Kenya, and to establish the major benefits of implementation of cloud computing strategy by Commercial Banks in Kenya and to find out the challenges facing the implementation of cloud computing strategy by Commercial Banks in Kenya.

First, the research findings revealed that cloud computing strategy is important for all commercial banks in Kenya in improving the efficiency of operations. To prove this, the majority of the targeted participants stated that most of the commercial banking institutions in Kenya have implemented cloud computing as a strategy aimed at improving their operations as well as their performance. Most importantly, the study findings indicated that the majority of the participants of the study were the IT managers, who were represented by 37% of the targeted respondents, hence; there is a high probability that the correct information was obtained relating to the implementation of cloud computing strategy by commercial banks in Kenya.
Regarding the level of satisfaction of the commercial banks with the cloud computing strategy, the findings of the study revealed that the targeted banking institutions were very satisfied with cloud computing as a strategy that has been implemented to assist in the daily operations as shown by 51%. The findings of the study therefore revealed that the level of satisfaction provides evidence that cloud computing has been embraced as an important strategy in the Kenyan commercial banks, hence; the high rates at which it is being implemented. More so, from the study findings, it was evident that cloud computing as a strategy implemented in the commercial banks added value to their operations to a great extent as shown by 43%.

Most importantly, from the study findings, the there existed a gap current ‘as is’ state and the desired ‘to be’ state to be able to come up with more improved solutions. The existence of the gap shows that though cloud computing strategy is being implemented, and has been implemented in the past, it has some challenges that the banking institutions face. This implies that the desired ‘to be’ state needs the strategy to be improved in the future so that the level of satisfaction to the commercial banks can be improved. The findings on this objective imply that the cloud computing strategy is very important to the Kenyan commercial banks, hence; prompting its implementation in these banks. These findings also concur with those of a study done by Wang, von Laszewski & Younge (2010), which revealed that cloud computing strategy provides three primary sources of business value: efficiency, agility, and innovation. Moreover, the cloud computing strategy enables banks and financial institutions to transform their business processes and grow organically in new sectors and geographies without incurring huge costs for establishing a physical presence. Wang, von Laszewski & Younge (2010) also revealed that with proper implementation of cloud computing strategy an organization is able to create new markets
and services for the banks for the customers and gain a competitive edge, just as this study confirmed.

5.2.1 Factors influencing the implementation of cloud computing strategy

On this objective, the study findings revealed that there were factors that influenced the implementation cloud computing as a strategy in their respective banks at 95% response rate. For more emphasis, on various factors provided by the researcher on a scale from which they were to select depending on which factors each respondent considered important as it influences cloud computing strategy implementation, the findings of the study revealed that scalability is an important factor that influences the implementation of cloud computing in the Kenyan commercial banks to a great extent as was shown by a mean of 4.233.

Other major factors that the study found out as important and that influenced the implementation of cloud computing strategy in commercial banks in Kenya to a great extent included security, market dynamics, performance, reliability, compliance, and environmental issues. The findings of the study revealed additional factors that the participants identified which included accessibility to the banking services by customers, recent technological developments and innovation. These findings of the study concur with those of a study conducted by Feuerlicht (2010) that found out that the security and privacy, identity management standards, and the need for sharing and collaboration in today’s highly competitive world have a positive effect on using and adopting cloud computing. Hence; the herein mentioned factors are always considered by any organization seeking to implement the cloud computing strategy.
5.2.2 Benefits of implementation of cloud computing strategy

On this objective, the study sought to establish whether there were any benefits that the respondents had got from the cloud computing strategy usage in their banks. According to the findings of the study, there are benefits associated with the implementation of cloud computing in their respective banks as was shown by a rate of 93%. Again, the study findings showed that the implementation of cloud computing strategy improves the quality of the work as was supported by 80% of the targeted respondents. Additionally, the findings of the study revealed that cloud computing strategy enhances organizational planning and reliability as shown by a mean of 4.243, the implementation process of cloud computing involves a negligible amount of time and effort as shown by mean of 4.176, and that the utilization of cloud computing strategy enables us accomplish tasks more quickly as shown by mean of 4.014.

Also, the study findings revealed that cloud computing strategy helps the business to align with IT in terms of strategic thinking as shown by mean of 3.967, cloud computing implementation organization is able to lower costs as shown by mean of 3.901 and that cloud computing strategy implementation enables the business to align with the IT teams to meet business goals as shown by mean of 3.872. Further, the study findings revealed that the usage of cloud computing strategy reduced capital expenditure as represented by mean of 3.846, cloud computing strategy implementation enables business agility as shown by mean of 3.8, organizations are be able to pay as they use i.e. Pay for what they use as shown by mean of 3.839, and that implementing cloud computing strategy can help transform organizations peoples processes and systems to futuristic thinking as shown by mean of 3.827.
Most importantly, the findings of this study revealed that the organizations are able to save on human resource, power and storage space if the management adopts this initiative as shown by 40%. While most participants stated that the overall cost of using cloud computing strategy is less than the cost of installing or developing a technology in house. These findings concurred with Horrigan (2008), who carried out a study to examine the main benefits of cloud computing strategy, which revealed that there are six main benefits, the first one is lower costs: cloud computing strategy has the ability to pool all of the computing resources that can be distributed to applications as needed, optimizing the use of the sum of the computing resources and delivering better efficiency and utilization of the entire shared infrastructure. According to Horrigan (2008), the second benefit is reduced capital expenditure: whether an organization chooses a public cloud strategy or outsourced private cloud computing strategy option, cloud computing delivers a better cash flow by eliminating the capital expense associated with building the server infrastructure.

Regarding other benefits that the respondents may have enjoyed after the implementation and use of cloud computing in their respective banks, the researcher tallied the most important responses and reported in this study. According to the findings of the study, the implementation of cloud computing strategy leads to a long term benefit, which increased revenue, the cloud strategy leads cost of operations, and that the cloud strategy leads to operations efficiency.

5.2.3 Challenges facing the implementation of cloud computing strategy

On this objective, there are challenges in existence that have hampered the efforts of many commercial banks in the implementation of cloud strategy as shown by 96% of the tallied
responses. More importantly, the findings showed that their banks faced challenges in the process of cloud computing implementation to a great extent as shown by 59%, very great extent as shown by 22%, moderate extent as shown by 10%, and to a little extent as shown by 9%. These findings concur with those of a study done by Melvin & Greer (2009), which revealed that most organizations have concerns around the potential security risks posed by cloud computing strategy implementation in their operational framework.

On various distinguished challenges of implementation of cloud computing strategy and how they affected the implementation of cloud computing by commercial banks in Kenya, the findings of the study showed that concerns over security of cloud computing strategy were a major challenge facing cloud computing strategy implementation (mean=4.352), difficulty in migrating in and out of the cloud computing strategy and switching providers was a major challenge (mean=4.311), cloud computing strategy providers still lack round-the-clock service resulting in frequency outages (mean=4.311), and that the firm would spend more for the bandwidth than it would on hardware and in-house software (mean=4.281). The findings of the study also showed that respondents agreed that Cloud computing strategy can expose the firm to data security risks and minimize information privacy (mean=3.989), Resistance to change (mean=3.973), Insufficient leadership attention (mean=3.965), Limited resources of cash to operate cloud computing strategy (mean=3.945), Weak or inappropriate strategy (mean=3.888), Our bank does not trust the uptime or speed of cloud strategy services (mean=3.875), Difficulty in assessing the costs involved due to the on-demand nature of the services (mean=3.863), and that Firms that have adopted the cloud strategy report problems with the system thus the business cannot approve a failed strategy (mean=3.852). Most importantly, the findings of the study revealed that firms that have adopted the cloud strategy report problems with the system thus the
business cannot approve a failed strategy. These findings showed also showed that the implementation of cloud computing is faced by rampant challenges that need to be addressed.

5.3 Conclusions

From the findings of the study, various conclusions were made as follows;

The study concluded that cloud computing strategy is important for all commercial banks in Kenya in improving the efficiency of operations, and that most of the commercial banking institutions in Kenya have implemented cloud computing as a strategy aimed at improving their operations as well as their performance. Regarding the level of satisfaction of the commercial banks with the cloud computing strategy, the study concluded that the targeted banking institutions were very satisfied with cloud computing as a strategy that has been implemented to assist in the daily operations. The study therefore concluded that the level of satisfaction provides evidence that cloud computing has been embraced as an important strategy in the Kenyan commercial banks, hence; the high rates at which it is being implemented. More so, the study concluded that cloud computing as a strategy implemented in the commercial banks added value to their operations.

Most importantly, the study concluded that there exists a gap current ‘as is’ state and the desired ‘to be’ state to be able to come up with more improved solutions. The existence of the gap shows that though cloud computing strategy is being implemented, and has been implemented in the past, it has some challenges that the banking institutions face. This implies that the desired ‘to be’ state needs the strategy to be improved in the future so that the level of satisfaction to the commercial banks can be improved. This implies that the cloud computing strategy is very important to the Kenyan commercial banks, hence; prompting its implementation in these banks.
These conclusions concur with those of a study done by Wang, von Laszewski & Younge (2010), which revealed that cloud computing strategy provides three primary sources of business value: efficiency, agility, and innovation. Moreover, the cloud computing strategy enables banks and financial institutions to transform their business processes and grow organically in new sectors and geographies without incurring huge costs for establishing a physical presence. Wang, von Laszewski & Younge (2010) also concluded that with proper implementation of cloud computing strategy an organization is able to create new markets and services for the banks for the customers and gain a competitive edge, just as this study confirmed.

### 5.2.1 Factors influencing the implementation of cloud computing strategy

On this objective, the study finding concluded that there were many factors that influenced the implementation cloud computing as a strategy in their respective banks. The study concluded that scalability is an important factor that influences the implementation of cloud computing in the Kenyan commercial banks. The study’s conclusion was also that other major factors that influenced the implementation of cloud computing strategy in commercial banks in Kenya included security, market dynamics, performance, reliability, compliance and environmental issues. The study also concluded that there are other additional factors that the participants identified which included accessibility to the banking services by customers, recent technological developments and innovation. These conclusions of the study concur with those of a study conducted by Feuerlicht (2010) that found out that the security and privacy, identity management standards, and the need for sharing and collaboration in today’s highly competitive world have a positive effect on using and adopting cloud computing. Hence; the herein mentioned factors are always considered by any organization seeking to implement the cloud computing strategy.
5.2.2 Benefits of implementation of cloud computing strategy

On this objective, the study concluded that there are benefits associated with the implementation of cloud computing in their respective banks. Again, the study concluded that the implementation of cloud computing strategy improves the quality of the work, enhances organizational planning and reliability, the implementation process of cloud computing involves a negligible amount of time and effort, and that the utilization of cloud computing strategy enables us accomplish tasks more quickly.

Also, the study concluded that cloud computing strategy helps the business to align with IT in terms of strategic thinking, cloud computing implementation organization is able to lower costs, and that cloud computing strategy implementation enables the business to align with the IT teams to meet business goals. Further, the study concluded that the usage of cloud computing strategy reduced capital expenditure, enables business agility, organizations are able to pay as they use i.e. Pay for what they use, and that implementing cloud computing strategy can help transform organizations peoples processes and systems to futuristic thinking.

Most importantly, the study concluded that the organizations are able to save on human resource, power and storage space if the management adopts this initiative. These conclusions concurred with Horrigan (2008), who carried out a study to examine the main benefits of cloud computing strategy, which revealed that there are six main benefits, the first one is lower costs: cloud computing strategy has the ability to pool all of the computing resources that can be distributed to applications as needed, optimizing the use of the sum of the computing resources and delivering better efficiency and utilization of the entire shared infrastructure. According to Horrigan (2008), the second benefit is reduced capital expenditure: whether an organization chooses a public cloud strategy or outsourced private cloud computing strategy option, cloud
computing delivers a better cash flow by eliminating the capital expense associated with building the server infrastructure. Regarding other benefits that the respondents may have enjoyed after the implementation and use of cloud computing in their respective banks, the study concluded that the implementation of cloud computing strategy leads to a long term benefit, which increased revenue, the cloud strategy leads cost of operations, and that the cloud strategy leads to operations efficiency.

5.2.3 Challenges facing the implementation of cloud computing strategy

On this objective, the study concluded that there are challenges in existence that have hampered the efforts of many commercial banks in the implementation of cloud strategy. More importantly, the study concluded that their banks faced challenges in the process of cloud computing implementation to a great extent. These conclusions concur with those of a study done by Melvin & Greer (2009), which revealed that most organizations have concerns around the potential security risks posed by cloud computing strategy implementation in their operational framework.

On various distinguished challenges of implementation of cloud computing strategy and how they affected the implementation of cloud computing by commercial banks in Kenya, the study concluded that concerns over security of cloud computing strategy were a major challenge facing cloud computing strategy implementation. Additionally, the study concluded that difficulty in migrating in and out of the cloud computing strategy and switching providers was a major challenge. Also, the study concluded that cloud computing strategy providers still lack round-the-clock service resulting in frequency outages, and that the firm would spend more for the bandwidth than it would on hardware and in-house software.
The study also concluded that cloud computing strategy can expose the firm to data security risks and minimize information privacy, which is a major challenge. As well, the study concluded that their banks did not trust the uptime or speed of cloud strategy service. Most importantly, the study concluded that difficulty in assessing the costs involved due to the on-demand nature of the services is a challenge to cloud computing strategy, most of the banks have limited resources of cash to operate cloud computing strategy, sometimes they have a problem with weak or inappropriate strategy, some banks have insufficient leadership attention that can facilitate cloud computing strategy implementation, and that some banks are faced by the challenge of resistance to change, hindering cloud computing strategy implementation. Most importantly, the study concluded that firms that have adopted the cloud strategy report problems with the system, thus; the business cannot approve a failed strategy. It is therefore evident that the implementation of cloud computing is faced by rampant challenges that need to be addressed.

5.4 Recommendations of the study

The study makes the following recommendations based on the findings and conclusions:

First, because the findings have indicated that most of the commercial banks in Kenya have implemented cloud computing strategy in their operational systems, it is important for the management of these banks, especially the Information Communication Technology to emphasize on the importance of cloud computing strategy in the banks. This will ensure that all operations are connected to the cloud, and that efficiency of operations is enhanced.

Additionally, the study recommends that the commercial banks that use the cloud computing strategy should ensure that they evaluate the various factors affecting the technology’s
effectiveness in order to ensure that they have the appropriate applications in place. The management should take lead in ensuring the adoption of the correct applications.

Further, cloud computing vendors and service providers need to evaluate customers’ concerns and factors hindering the banking institutions from adopting and implementing cloud technology. This will enable them to come up with a plan to address the concerns and hence help customers implement the cloud technology to a great extent.

5.5 Recommendations for further research
This study recommends that further research should be carried out focusing on all the banking institutions societies in Kenya, so as to confirm whether the same or different findings will be obtained. This way, it would be easy for the stakeholders in the banks in Kenya to identify areas of strength that needs to be emphasized on as well as the areas of weakness in Kenya’s banking industry that need improvement. Additionally, other studies should be done in the future focusing on the cloud applications that the banks can apply in order to promote the effectiveness of the cloud computing strategy in Kenya and the entire world.
REFERENCES


PRWEB (2012). *Garner predicts cloud computing spending to increase by 100 percent In 2016*, Apps Care.

Reach to Rural India.


APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

Wachira Hannah Waniru
Cell; 0721263331

Dear Respondent,

RE: SUPPORT FOR A MASTER’S DEGREE PROJECT

I am a student undertaking Master of Business Administration at the University of Nairobi. As part of the requirement for the completion of my studies, I’m undertaking a research to establish the implementation of cloud computing strategy by commercial banks in Kenya. In this regard, I am kindly requesting for your support in terms of time, and by responding to the attached questionnaire. Your accuracy and candid response will be critical in ensuring objective research. It will not be necessary to write your name on this questionnaire, and for your comfort, all information received will be treated in strict confidence.

In addition, the findings of the study will solely be used for academic research purposes and to enhance knowledge in the field of cloud computing in commercial banks. If need be, the research report may be presented to your institution for information and record.

Thank you for your valuable time.

Yours faithfully

Wachira Hannah Waniru
APPENDIX 2: QUESTIONAIRRE

SECTION A: GENERAL INFORMATION
(Use a tick where appropriate (√)

1. How long have you worked with the Bank?
   - Under 10 Years [ ]
   - 10 – 30 Years [ ]
   - 31 – 40 Years [ ]
   - Over 40 Years [ ]

2. Indicate your level of education
   - Secondary School ( )
   - College diploma ( )
   - University degree ( )
   - Post graduate degree ( )

3. What is your designation in this organization?
   - Strategy implementation specialist [ ]
   - IT Manager [ ]
   - Bank manager [ ]
   - Others (Please indicate) …………………………………..

5: Which area of your business is strongest?
   - Mobile Banking [ ]
   - Corporate and investment [ ]
   - Loans and mortgages [ ]

6. What percentage of the Bank is the local shareholding compared to the foreign shareholding?
   - Less than 50% Local Shareholder ownership ( )
   - Higher than 50% Local ownership ( )
   - Other extents (Please indicate) ………………………………………

SECTION B: CLOUD COMPUTING STRATEGY IMPLEMENTATION

7. Has your bank implemented cloud computing strategy for its operations?
   (Yes [ ])
   (ii) No [ ]

8. If Yes in the question above, kindly rate your level of satisfaction with the service?
   - Very dissatisfied [ ]
   - Dissatisfied [ ]
   - Neutral [ ]
   - Satisfied [ ]
Very satisfied  [ ]

9. To what extent is the cloud computing strategy implementation adding value to the Bank?

1: Not at all  ( )        3: Great  ( )
2: Moderate  ( )                4: Very Great  ( )

10. Have you identified any gaps that exist between the current ‘as is’ state and the desired ‘to be’ state to be able to come up

SECTION C: FACTORS INFLUENCING THE IMPLEMENTATION OF CLOUD COMPUTING STRATEGY

11. To what extent do you consider each of the following factors on influencing cloud computing strategy implementation in your bank? Use a scale of 1-5: 1=Not at all, 2=little extent 3=Moderate Extent, 4=Greater Extent, 4=Very great extent

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td></td>
<td></td>
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<tr>
<td>Compliance</td>
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<tr>
<td>Performance</td>
<td></td>
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<tr>
<td>Integration with other services</td>
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</tr>
<tr>
<td>Scalability</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Environmental issues</td>
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<tr>
<td>Market Dynamics</td>
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<td></td>
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<tr>
<td>Internal Organization Politics</td>
<td></td>
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</tbody>
</table>
12. Explain other factors that you can consider that influences the implementation of cloud computing in your organization.

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

SECTION D: BENEFITS OF IMPLEMENTATION OF CLOUD COMPUTING STRATEGY

13. The following table shows information on some accrued benefits of cloud computing strategy. To what extent do you consider each of the following benefits of cloud computing strategy; kindly indicate your level of agreement with the statements with regard to your bank. Use a scale of 1-5, where; 1=Strongly agree, 2=Agree 3=Neutral, 4=disagree, 4=Strongly disagree

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The utilization of cloud computing strategy enables us accomplish tasks more quickly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The implementation of cloud computing strategy improves the quality of the work</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Cloud computing implementation organization is able to lower costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usage of cloud computing strategy reduced capital expenditure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>organizations will be able to pay as they use ie Pay for what they use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizations will be able to save on power, cooling and storage space if management adopts this initiative</td>
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<tr>
<td>Implementing cloud computing strategy can help transform organizations peoples</td>
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<td>processes and systems to futuristic thinking</td>
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<td>Cloud computing strategy has decreased our capital expenditure or investment in new infrastructure</td>
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<td>The overall cost of using cloud computing strategy is less than the cost of installing or developing a technology in house</td>
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<td>The implementation process of cloud computing involves a negligible amount of time and effort</td>
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<td>Cloud computing strategy enhances organizational planning and prediction</td>
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<td>Cloud computing strategy implementation enables business agility</td>
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<td>Implementing cloud computing strategy can transform the Banks, people, processes, and systems to futuristic thinking</td>
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<td>Cloud computing strategy helps the business to align with IT in terms of strategic thinking</td>
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<td>Cloud computing strategy implementation enables the business to align with the IT teams to meet business goals</td>
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14. Kindly list three (3) other benefits of implementing cloud computing strategy that you would consider.

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SECTION E: CHALLENGES FACING THE IMPLEMENTATION OF CLOUD COMPUTING STRATEGY
15. To what extent do you consider each of the following challenges of implementation of cloud computing strategy? Kindly indicate your level of your agreement as applicable to your bank. Use a scale of 1-5, where; 1=Strongly agree, 2=Agree 3=Neutral, 4=disagree, 4=Strongly disagree

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<tr>
<td>Limited resources of cash to operate cloud computing strategy</td>
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<td>Concerns over security of cloud computing strategy</td>
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<td>Our bank does not trust the uptime or speed of cloud strategy services</td>
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<td>Cloud computing strategy can expose the firm to data security risks and minimize information privacy</td>
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<td>The firm would spend more for the bandwidth than it would on hardware and in-house software</td>
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<td>Cloud computing strategy providers still lack round-the clock service resulting in frequent outages</td>
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<td>Firms that have adopted the cloud strategy report problems with the system thus the business cannot approve a failed strategy</td>
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<td>Difficulty in assessing the costs involved due to the on-demand nature of the services</td>
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<td>Difficulty in migrating in and out of the cloud computing strategy and switching providers</td>
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<td>Insufficient leadership attention</td>
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<td>Resistance to change</td>
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<td>Weak or inappropriate strategy</td>
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</table>
16. Kindly list three (3) other benefits of implementing cloud computing strategy that you would consider.

THANK YOU FOR YOUR PARTICIPATION