

[Electronic Theses and Dissertations](#)

2019

Analysis of factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County

Castro O. Ngongo
Strathmore Business School (SBS)
Strathmore University

Follow this and additional works at <https://su-plus.strathmore.edu/handle/11071/6653>

Recommended Citation

Ngongo, C. O. (2019). *Analysis of factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County* (Thesis, Strathmore University). Retrieved from <http://su-plus.strathmore.edu/handle/11071/6653>

**ANALYSIS OF FACTORS AFFECTING ADOPTION OF ICT SOLUTIONS IN DAIRY
FARMING COOPERATIVE SOCIETIES IN MERU COUNTY**

CASTRO ODHIAMBO NGONGO

REG NO: MBA/87789/15

**Submitted in partial fulfillment of the requirement for the Degree of Master in
Business Administration at Strathmore University**



STRATHMORE BUSINESS SCHOOL, NAIROBI, KENYA

2019

ABSTRACT

Information and Communication Technology (ICT) is viewed as a driver for both developed and developing countries. The benefits of ICT adoption by organizations range from opportunity and market access to operational efficiencies and making enterprises more competitive and successful. In assessing the usefulness of ICT in agriculture, significant strides in efficiency can be achieved through the use of modern technology in upstream and downstream processes within cooperative societies. However, in reality there is low uptake of technological products in the agricultural sector and particularly by the cooperative societies in Kenya. This low uptake is attributed to the fact that not all cooperative societies and in particular the dairy cooperatives are convinced of the usefulness of ICT in enhancing their productivity. The study specifically sought: to identify and assess the factors that influence uptake of ICT in dairy cooperative societies in Meru County, Kenya; and to examine the contribution of ICT on productivity in dairy cooperative societies in Meru County, Kenya. Meru County was selected as study area due to the number of dairy cooperatives and less research has been done on them unlike other zones in the country. A census survey was used to collect data from general managers and IT managers of dairy cooperatives in Meru County. Data was collected using a structured questionnaire from 40 respondents drawn from the 20 dairy cooperatives in Meru County. Data was analyzed using SPSS version 24.0 for descriptive and inferential statistics. The findings were expected to benefit the management of the dairy cooperatives in Kenya and the regulators and the policy makers such as the Kenya Dairy Boards (KDB) as they are able to use the findings as the base upon which to review challenges in ICT adoption in the dairy cooperatives. The study findings reveal that majority of the respondents agreed that their dairy cooperative society have adequately adopted ICT solutions and to a very great extent ICT contributes to the productivity of dairy cooperative societies in Meru County, Kenya. The study findings reveal that majority of the respondents agreed that cost of ICT adoption, perceived usefulness, staff competency/skill, and top management support to a very great extent influences adoption of ICT solutions in dairy cooperative societies. The study findings revealed that ICT contribution, cost of adoption of ICT, perceived usefulness, staff competency, and top management support have a statistically significant influence on the adoption of ICT solutions in dairy farming cooperative societies. Perceived Usefulness was found to be the most significant among the four variables followed by top management support, cost of adoption, staff competency. The study therefore concludes that cost of ICT adoption, perceived usefulness, staff competency, and top management are factors that influence on the adoption of ICT solutions in dairy farming cooperative societies. The study recommends the need for adequate financing, need for the management of dairy cooperatives to communicate the usefulness of ICT adoption and ease of use to its staff and members, need to recruit and train employees in a bid to motivate them to embrace and use modern ICT technologies, and need for top management support in regard to ICT opportunity development.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Kenya is among the largest producers of milk in Africa with its dairy farming being the single largest agriculture sub sector in Kenya. Kenya's dairy industry is dynamic and plays a vital economic and nutrition role in many people's lives from farmers to milk hawkers, processors, and consumers (Wambugu, Kirimi & Opiyo, 2015). With an average national family size of about six persons, Kenya's dairy industry sector supports nearly 5 million Kenyans who rely on daily income from milk sales (United States Agency for International Development-USAID Kenya, 2008).

The dairy industry is one of the most developed sectors in Kenya as it contributes 14% of the agricultural gross domestic product (GDP) and accounts for 6-8% of the country's GDP (IFAD, 2017; USAID/GoK, 2016). The economic development and high employment opportunities are attributed to increased milk production because there is greater consumer demand for affordable dairy products are enormous. Increasing effectiveness and developing an efficient dairy marketing and support system through the dairy Small Business Organizations (SBOs) for smallholder farmers is therefore critical in achieving vision 2030's goal of poverty reduction and hunger eradication in Kenya (Mureithi, 2013).

Small scale farmers face numerous challenges some of which include difficulties in accessing credit, in-ability to build milk products with economic value, and quality assurance (Kinuthia, 2012). To manage the above challenges, small scale farmers have come up with dairy cooperative societies (Kinuthia, 2012). Mburu (2009) underlines that at the minimum the

cooperatives provide milk collection while the advanced cooperatives also grant processing, marketing, credit access, and veterinary services (Karanja, 2002). Cooperatives ensures small holder farmers to benefit from economies of scale, access to credit, reliable markets, and stronger linkages with other service providers (Kinuthia, 2012).

Cooperative societies in Kenya are categorized into two namely: financial cooperatives which are referred to as SACCO's and non-financial cooperatives which include farm produce and other commodities, housing, marketing, and transport cooperatives. Savings and Credit Cooperatives Societies normally known as SACCO's are part of the larger co-operative movement in Kenya. A SACCO is defined as a member owned financial institution which is democratically controlled by its members and operate with the purpose of promoting credit and other financial services to its members (MacPherson, 1999). Kenya has over 5,000 registered SACCOs with more than \$5 billion in savings and an asset base of \$6.9 billion. Fountain (2007), highlights that membership is open to all who belong to groups with a common bond who agree to save their money together so as to lend to each other at reasonable rates of interest.

The current membership of farmer's or agriculture cooperatives in Kenya is approximately 600,000 active members, found in two main sectors: the cooperative coffee sector with an estimated 400,000 members and the cooperative dairy sector, with about 100,000 members (Food and Agriculture Organization- FAO, 2018). Dairy cooperatives have for a long time had a monopoly to collect milk from producers, and Kenya Cooperative Creameries (KCC) had a monopoly to process milk for the market. In 1992, the dairy market was liberalized and it

resulted in increased competition both in the raw materials and consumer markets with the emergence of milk hawkers and new private dairy plants (FAO, 2018).

Dairy cooperative societies have faced several challenges specifically after liberation leading to various cooperative societies not performing well compared to other cooperative societies (Mwangi, 2013). Among the factors that could influence poor performance of cooperative societies in the liberation period are: lack of training and unpreparedness by cooperative societies to modernize and embrace technology, poor management and leadership since majority of the cooperative leaders are either illiterate or with low education (Karanja, 2003). Further findings by Mwangi (2013) and Omore et al. (2009) reveal that mismanagement and corruption influence performance of dairy cooperative societies.

Information and Communication Technology (ICT) is defined as digital tool or innovation used to aid in the gathering, processing of data and dissemination of information (Bekinsale and Ram, 2006). Recent economic background that is controlled by competition, globalization, and knowledge in regard to changes in technology has changed ways of doing business (Pavic et al., 2007). ICT has been viewed as the driver for both the countries that have developed and those that are developing. Due to the increased competition and the need to enter the global market and remain relevant, most businesses have adopted the use of ICT so as to enjoy the substantial benefits that it comes with (Usman et al., 2011). Application of the ICT has greatly affected the enterprises globally and several firms or organizations that have in turn changed the yield

worldwide, the way they handle their businesses and the way they respond to their customers (Noor, 2009).

Even as the use of ICT in agriculture is not a completely new phenomenon, information has in the recent past become a pivotal factor of production in agriculture (Rao, 2006). The resounding changes that have taken place in the last decade in ICT have touched almost every aspect of human activity, and dairy farming is not an exception (Winrock, 2003). Information is now perceived as a factor of production like other factors such as labor, capital and land (Rao, 2006). Dralega (2007) submits that if information is combined with other factors of production, it will enhance agricultural production and marketing. It is a critical resource for development and empowerment, giving farmers the ability to make informed decisions concerning production, marketing and management of agricultural products and services (Mureithi, 2013). Among the principal factors that influence adoption of ICT in organizations top management support and organization innovation lead. A study by Njau and Waiganjo (2015) found that innovative top management and organization innovation have a strong positive correlation with adoption of ICT.

ICT has the potency to transform cooperative societies. Among some of the benefits dairy cooperative derive from ICT include: transforming cooperatives by means of expanding their scope of potential networks and strengthening existing networks, ICT helps transform cooperatives management by enhancing management practices, and records. The benefits increase efficiency and reduces operating costs (United Nations-UN, 2012). The benefits derived from ICT adoption in small enterprises range from market access opportunity to operational

efficiencies thus making enterprises more competitive and successful (Atieno, 2015). Failure to adopt ICT leads to high cost of production and hence low profits (Gathu, 2017; Iortima, 2012).

The implementation of ICT applications in dairy cooperatives management is crucial to enable the cooperative to participate in the global market (Kumar, 2012). Globally, dairy cooperatives have facilitated development of farmer systems which link farmer to farmer and farmer to government for dairy business growth. Implementation of ICT allows management of dairy cooperatives to receive updated information, reduce reliability of human information storage, job duplication, and performance of various tasks that the dairy cooperatives need. In dairy service, ICT implementation leads in strategic planning roles by providing timely installation and distribution of ICT resources. ICT implementation offers professional and customer focused support service to all ICT service users (Neelameghan, 2005).

ICT in cooperatives is mostly used for administration, service delivery, and communication services. The ICT workflow in a dairy cooperative includes: file storage, training, conferencing, technology updates, communication, and live demos (Rajendra, 2009). ICT adoption aims to meet needs of the dairy employees and farmers. ICT infrastructure in dairy cooperatives provide support for milk procurement, milk payment, production, quality control, distribution, human resource management system, accounts, inventory, management information systems (MIS) reports, cattle feed modules activities by dairy employees and farmers (Kumar, 2012). With the vast benefits ICT brings to dairy cooperatives, previous studies done such by Mwangi (2013) Karanja (2003), and Omore et al. (2009) reveal that cooperative societies and more so dairy cooperatives in Kenya and in some parts of the world have not been keen on the uptake of ICT in

their processes. There is need for a study to assess whether there are any existing factors that affect adoption of ICT solutions in dairy farming cooperative societies

1.2 Statement of the Problem

Given the development scenario in Kenya's Agriculture, ICT is still evolving. The consensus, in assessing the usefulness of ICT in agriculture, is that significant strides in efficiency can be achieved through the use of modern technology in upstream and downstream processes within cooperative societies. However, in reality there is low uptake of technological products in the agricultural sector and particularly by the cooperative societies in Kenya (Waruguru, 2012). This low uptake is attributed to the fact that not all cooperative societies and in particular the dairy cooperatives are convinced of the usefulness of ICT in enhancing their productivity. Therefore, there is need to assess the factors affecting adoption of ICT solutions in dairy farming cooperative societies.

A number of studies carried out on adoption of ICT such by: Mwangi (2013); Gathu (2017); Mokaya (2012); Kinuthia (2012); Mureithi (2013); and Mugwe (2010) have failed to give detailed insights on the factors affecting adoption of ICT solutions in dairy farming cooperative societies. Although the studies mentioned here attained their objectives, they did not delve into the factors affecting adoption of ICT solutions in dairy farming cooperative societies. There is paucity of published work on factors affecting adoption of ICT solutions in dairy farming cooperative societies, particularly in the context of developing countries in the dynamic African region and specifically in Kenya. This study intended to bridge this gap in knowledge that existed.

1.3 Objectives of the Study

The general objective of this study was to analyze the adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. The study specifically sought:

- i) To find out the extent to which perceived cost of adoption influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.
- ii) To determine the extent to which perceived usefulness influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.
- iii) To assess the influence of staff competencies/skills on the adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.
- iv) To establish the extent to which top management support influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.
- v) To examine the contribution of ICT on productivity in dairy cooperative societies in Meru County, Kenya.

1.4 Research Questions

The study sought to answer the following questions;

- i) To what extent does perceived cost of adoption influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya?
- ii) To what extent does perceived usefulness influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya?
- iii) To what extent do staff competencies/skills influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya?
- iv) To what extent does top management support influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya?

- v) To examine the contribution of ICT on productivity in dairy cooperative societies in Meru County, Kenya.

1.5 Significance of the Study

The study is of great significance to the leadership of the dairy cooperatives in Kenya as they are able to use the results of the study as the base upon which to review challenges in ICT adoption in the dairy cooperatives. Necessary enhancements identified could be implemented to enhance dairy production and growth of the dairy industry. On the basis of the findings of the study, the dairy cooperatives in Kenya are expected to implement ICT adoption from a point of knowledge.

The regulators and the policy makers such as the Kenya Dairy Boards (KDB) will be able to use the findings of the study to formulate viable policy documents that effectively will in turn boost production of milk by the dairy cooperatives and growth of the dairy industry. These may relate to regulating those aspects that threaten to adversely impact on the operations and development of such organizations.

The study will provide supplementary information into the already existing body of literature on ICT adoption. The results of this study will improve existing knowledge and hence will be of benefit to both researchers and academicians who seek to explore and carry out further investigations. It will provide basis for further research.

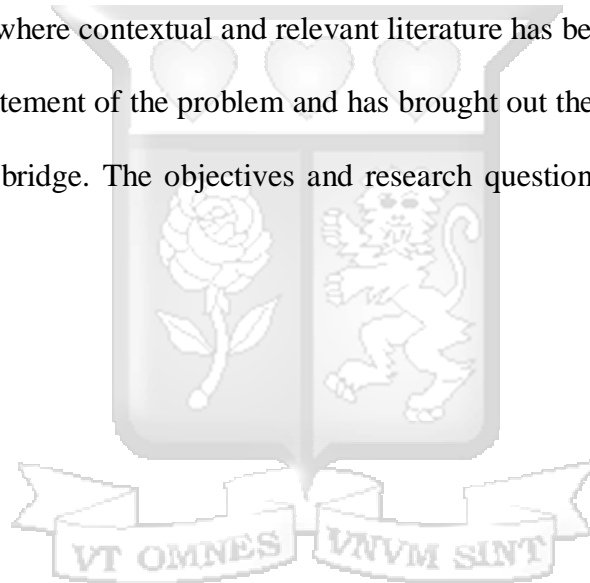
1.6 Scope of the Study

The aim of this study was to analyze the factors affecting adoption of ICT solutions as well as establishing the contributions of ICT to dairy farming cooperative societies in Meru County,

Kenya. This study focused on cooperatives in the agriculture sector specifically narrowing down to dairy cooperatives. This study employed a descriptive research design. The population for the study was dairy cooperatives from Meru County which were selected from Meru Central Dairy Co-operative Union. A questionnaire that consisted of both closed and open-ended questions was used to collect data. The study was conducted in a period of 4months.

1.7 Chapter Summary

This chapter has presented the introduction of the study. The chapter has looked at the background of the study where contextual and relevant literature has been discussed. The chapter has also presented the statement of the problem and has brought out the gap that exists which the current study intends to bridge. The objectives and research questions guiding the study have been discussed as well.



CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter looks at existing literature pertinent to the study as presented by other scholars and researchers. The chapter discusses the theories that this study is grounded upon under the theoretical literature section. Empirical literature of the study that covers previous studies carried out on the factors influencing uptake of ICT in dairy cooperative societies as presented by other researchers at international and local scale is also discussed. The chapter further presents the conceptual framework which unravels the relationship between the variables of the study. By pointing out the gaps in the previous studies, it gives the current study a fair chance to identify gaps that exist.

2.2 Theoretical Literature

The theories underpinning the current study are discussed in this section. This section presents the theories associated with implementation of ICT adoption and its uptake by organizations. The theories reviewed include the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and Innovation Diffusion Theory (IDT).

2.2.1 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was designed by Davis to illustrate technology usage behavior (Munene, 2015). TAM is a theory that design how users agree to the use of technology (Bagozzi and Warshaw, 2006). In accordance with Bagozzi and Warshaw (2006), TAM model asserts that when intended users are presented with a new technology, there are set of factors such as perceived usefulness (PU) and perceived ease-of-use (PEOU) that persuades user's

decision with regard to how and when they will use it. Ajzen et al. (2007) posits that the theory holds firm behavioral elements which assume that when a person has an intent to act they will do so without restraints. Davis (2006), posits that the TAM model suggests that users establishes a positive attitude towards the technology to be useful and easy to use.

A number of studies such by Adam et al. (2008); Hendrick et al. (2005); and Subramanian (2005) found that empirical evidence on the relationships exist between usefulness, ease of use and ICT uptake. These studies confirm the validity of the Davis' findings on the relationship that exists. Conversely, TAM model fails to account for social influence in the adoption and uptake of new technologies (Mazhar, 2006). Nonetheless, TAM is without doubt among the best models to use in this current study as it represents an important theoretical contribution towards understanding ICT use and uptake. Figure 2.1 presents the Technology Acceptance Model;

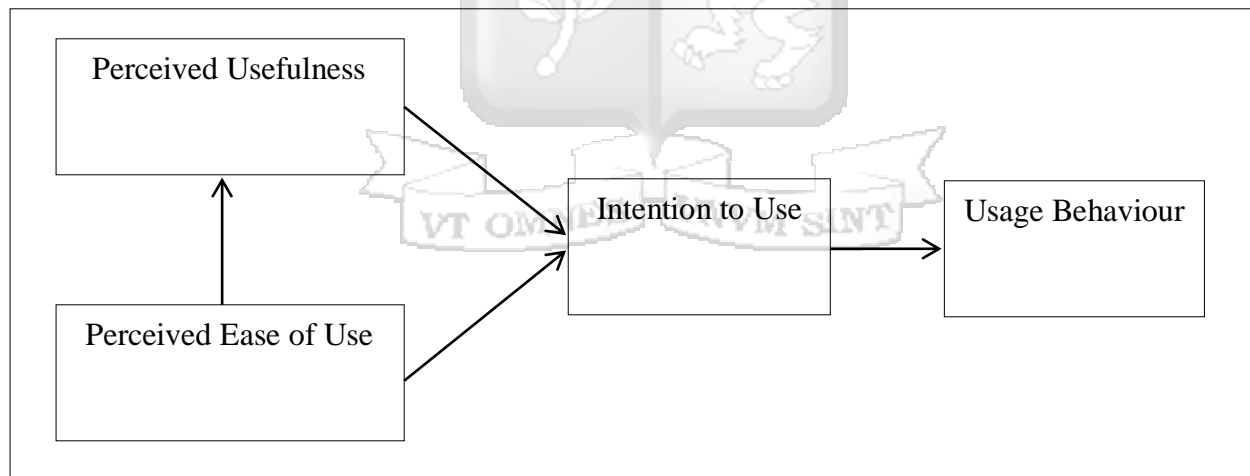


Figure 2.1: Technology Acceptance Model (TAM)

Source: Bagozzi and Warshaw (2006)

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

The Unified Theory of Acceptance and Use of Technology (UTAUT) model was formulated by Venkatesh and Bala (Munene, 2015). The UTAUT model explains user intentions to use an information system or related subsequent usage behavior of ICT (Venkatesh and Bala, 2008). The UTAUT model theory basically proposes that four key constructs namely: performance expectancy, effort expectancy, social influence, and facilitating conditions determine of usage intention and behavior in individuals. However, factors such as gender, age, and experience mediate the impact of the four constructs of usage and behavior. The UTAUT model was formulated to fill missing gaps in the TAM model (Munene, 2015). UTAUT presents a model with so many constructs that render it chaotic (Bagozzi, 2007). Nevertheless, Bagozzi (2007) noted that UTAUT can be used in decision making when adopting or implementing ICT in any organization. Figure 2.2 represents the Unified Theory of Acceptance and Use of Technology (UTAUT) Model.

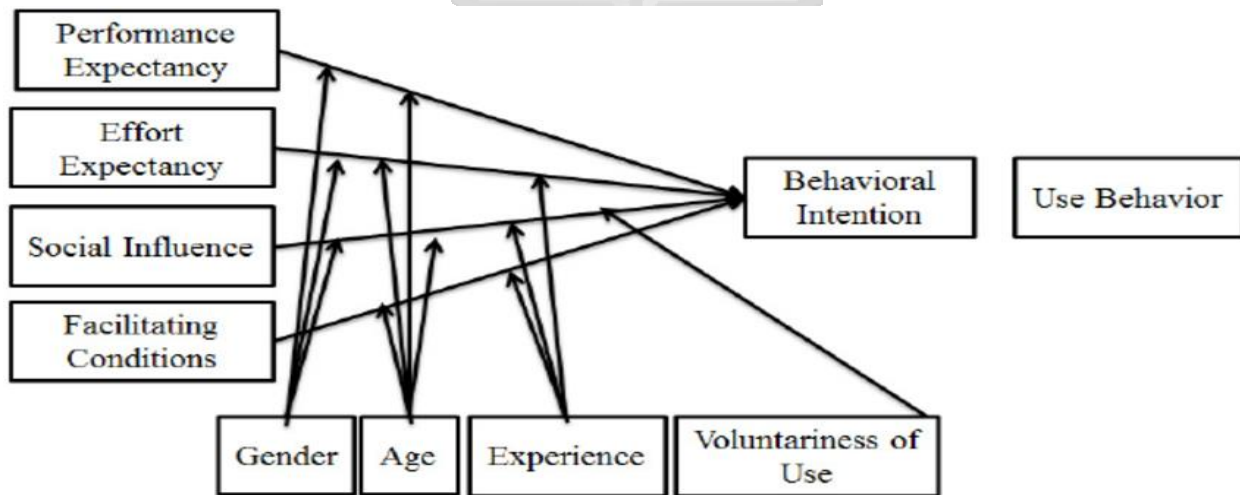


Figure 2.2: The Unified Theory of Acceptance and Use of Technology (UTAUT) model

Source: Venkatesh and Bala (2008)

2.2.3 Innovation Diffusion Theory (IDT)

The innovation diffusion theory of perceived usefulness was formulated by Rogers in 1962 (Rogers, 1995). Diffusion is the activity of disseminating information about a new technology through a given communication channel in order to inform a population about the new technology (Rogers, 1995). Therefore, the innovation diffusion theory argues that a user makes the decision to adopt a technology as a result of the information they have received about the technology (Babbie and Benaquisto, 2009). According to Rogers (1995), IDT is made up of five characteristics namely: relative advantage, compatibility, observability, trial-ability, and complexity.

Relative advantage is the degree to which a new technology is viewed to be superior than the technology it's substituting. This factor is considered to be one of the most predictors of the innovation adoption (Brand and Huizingh, 2008). Compatibility describes the degree to which a technology is consistent with the intended users present values, previous experiences, and requirements (Babbie and Benaquisto, 2009). Observability is the level to which the outcome of a technology can be seen by its users and other individuals (Babbie and Benaquisto, 2009). Trial-ability defines the level to which technology can be tried and tested in a given environment (Babbie et al., 2009). Complexity is the perceived level of complexity by the user of the technology in understanding the technology and its user friendliness (Chang et al., 2001). These characteristics are used to explain why an individual would adopt a technology and the decision-making process (Barba-Sanchez, 2007). Figure 2.3 represents the Innovation Diffusion Theory Model;

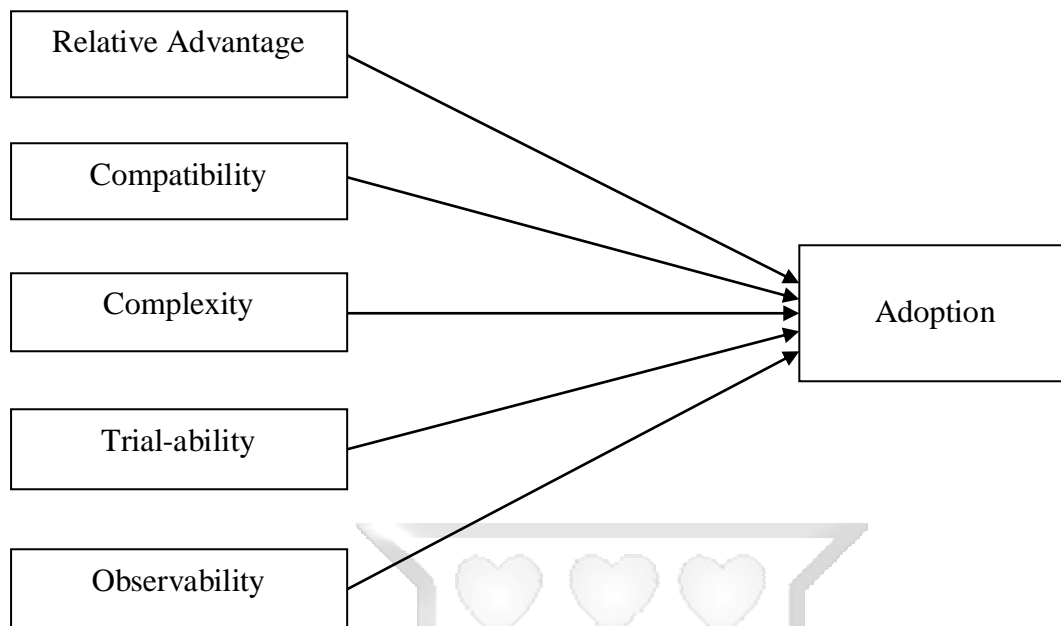


Figure 2.3: The Innovation Diffusion Theory (IDT)

Source: (Babbie and Benaquisto (2009))

2.2.4 Resource Based View Theory

The Resource-based View (RBV) is a strategic management theory that is widely used in project management; it examines how resources can drive competitive advantage (William et al., 2010). Competitive advantage is the ability to create more value than rivals, and therefore generate higher returns on investment. Sustainable competitive advantage requires enduring benefits through capabilities that are not easily imitated (Killen et al., 2012). The RBV is built on the concept that resources and capabilities are not heterogeneous across other organizations, and through the utilization of this concept the success rate variations between organizations can be explained. Kraaijenbrink et al (2010) quoted the argument of Barney (1991a, 1994, 2002) that “if

a firm is to achieve a state of sustained competitive advantage, it must acquire and control valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities.

The Resource Based View (RBV) theory is founded on the work of Penrose (1959), and is predominantly used by researchers studying ICT (Wright and Snell, 2002). Under this theory, Barney, Wright, and Ketchen (2001) posit that an organization gain competitive advantage by not only acquiring but also developing resources in technology that put in unique value and that are difficult for competitors to imitate. A firm's success is due to joint resources such as ICT and the crucial attributes of knowledge, skill, and talent and capabilities which a firm owns and makes it different from its competitors constituting a source of competitive advantage (Porter's, 2005). Therefore using the resource-based view, technology adoption in an organization are equipped towards strengthening significant capabilities and knowledge (Kepha, 2014). IT is considered a valuable organizational resource that can enhance organizational capabilities and eventually lead to higher performance. In a recent study, in strategic management, Crook et al. (2008) argued that RBV has emerged as a key perspective guiding inquiry into the determinants of organizational performance.

2.3 Empirical Literature

This section looks at the factors influencing adoption of ICT solutions as presented by other scholars and researchers.

2.3.1 Perceived Cost Influence on Adoption of ICT Solutions

Ernst and Young (2012) established that the cost related to adoption of ICT solutions is a factor that influences an organizations behavior of adoption. Seyal and Rahim (2006) found a

significant relationship between cost and adoption of technology. Small and Medium Enterprises the category where many cooperatives are found, are more likely to adopt ICT systems which are perceived to have lower financial implications (Dixon et al., 2002). A concept known as Total Cost of Ownership (TCO) is used to determine the entire cost of implementing and maintenance associated with ownership of an ICT asset (Seyal and Rahim, 2006). Reducing the cost of ownership of ICT assets will result in higher rate of ICT adoption. Tan and Wu (2003), highlight that organizations spend huge sums of their budget annually on ICT systems and platforms though as competition grows so does the need to capitalize on the competitive advantage resulting from ICT adoption.

According to Chapman et al. (2010) costs regarding service and support can be viewed in various ways. The level of complexity of ICT systems and infrastructure affects the cost of support. Recurring operations, which are covered in support agreements, is another cost that can be quantified easily. Some system implementations have higher setup and operating costs than other systems (Chapman et al., 2010). ICT applications and systems that are setup in a way that they need manual upgrading, on users' devices such as personal computers and mobile devices usually tend to have higher support cost than Web-based applications and systems.

Research by Chapman et al. (2010) has shown that ICT systems based on market standards and easily available add on do better in the market as service and support is available and prices are kept down due to market forces of supply and demand. Nonstandard ICT systems that use specialized hardware and software usually require skills that are rarer to find and thus tend to be more expensive (Chapman et al., 2010). The same market forces and widespread competition

that tend to lower service costs for ICT hardware and software make it more expensive to service and maintain nonstandard ICT systems (Tan and Wu, 2003).

Some tangible costs need companies to research on them, in order to evaluate their actual cost. For instance, training employees, to perform system maintenance and the costs associated with upgrades contribute to cost of ownership (Chapman, James-Moore, Szczygiel, and Thompson, 2010). Even if the costs are considered in the overall cost of purchase, training and upgrading tend to be recurrent expenditure. Companies should also consider costs of operating systems that will manage the ICT equipment or infrastructure and also license cost, whether they are a one of or annual (Chapman et al., 2010). Application software usually attracts license fees, this expense must be considered by the organization. This software expense contributes a large percentage to the overall cost of acquisition. This is a major cost center for nonstandard systems, software costs can reach to a level that it surpasses hardware cost. While evaluating the cost of software, some of the same factors that affect hardware cost versus performance are applicable (Tan and Wu, 2003).

2.3.2 Perceived Usefulness Influence on Adoption of ICT Solutions

Perceived usefulness defines user's perception that using a specific application improves output and processes (Lu, Yu, Liu, and Yao, 2003). It provides insight into how actual use and intention to use are influenced (Lu et al., 2003). The concept of perceived usefulness is based on the theoretical model that includes the theory of self-efficacy (Bandura, 1982), the theory of behavioral decision (Beach and Mitchell, 1978), the theory of reasoned action (Ajzen and Fishbein, 2005) and the theory of planned behavior (Ajzen, 1999). The theory of self-efficacy

(Bandura, 1982) posits that individual behavior is influenced by the beliefs of expected result of chosen behavior. The concept of perceived usefulness is the equivalent of the beliefs in the theory of self-efficacy, expected as a result of the behavior of adoption and use of ICTs.

Perceived usefulness is also seen as the improvement in performance that an individual believes he can acquire when using a technology (Otieno, 2015). The usefulness of the technology is related to the perception of the person who uses it in performing his or her work (Davis, 2013). It is in this view that Davis (2013) defined it as the percentage of performance improvement expected from using the system and assessed through six indicators that actually represent the expected benefits of using the technology, namely: the speed in performing given tasks, the improvement in work performance, the improvement in productivity, the improvement in efficiency at work, the improvement in business process at work and the usefulness of technologies in the work environment. Consequently, we define the perceived usefulness of ICT as the level of an individual's conviction that the use of ICT will drastically improve the individual performance at work (Hausser and Simmie, 2011).

Otieno (2015) asserts that the acceptance of ICT is influenced by the perception of their intended users. The more they are persuaded that their use is enhancing their performance, the more they adopt and integrate them in their work. This theory of the positive impact of perceived usefulness of ICT on their use has been verified in many studies (Bukhari, 2008), confirming that perceived usefulness is a determining factor of adoption and use of technologies, that the pre-adoption attitude of users has a basis on the perceptions of the utility of the technology, and that more than sixty percent of the explanatory power of the technology acceptance model is as a result of

perceived usefulness (Venkatesh and Davis, 2000). King and Marks (2008) showed that the use and adoption of knowledge management systems was feasible only if their users perceive them as useful. Based on this analysis, it is obvious that perceived usefulness has a positive effect on adoption behavior of organizations in regard to ICT. From the literature reviewed it can be deduced that perceived usefulness of ICT has a positive influence on the adoption and ICTs usage.

2.3.3 Staff Competencies/Skills Influence on Adoption of ICT Solutions

Organizations are increasingly relying on the skills their employees acquire during their career, and it is critical for these organizations to be cognizant of their employee's knowledge and skills especially in regard to information technology (Cragg et al., 2012). Reynolds, Savage and Williams (2014) in their study found that SME owners and top managers are less likely to adopt ICT if their employees are not accustomed with the common ICTs used in the business environment. This happens because SMEs may not be able to hire or train employees so that they may acquire the skills and knowledge required to aid the company adopt and use ICT (Reynolds et al., 2014).

The lack of suitable skilled employees and managerial staff with sufficient ICT knowledge is a significant factor that determines the implementations and use of ICT (Alberto and Fernando, 2007). Allison (1999) found that When companies have skilled and knowledgeable employees their ability to adopt and use ICT increases, thus leading to successful adoption of ICT in their organizations. More researches conducted by researchers such as Cragg and King (2012) lead us to believe that when SMEs lack employees and managers with the desired knowledge of ICT, these employees may become a deterrent to the adoption of Information technology as they may

feel overwhelmed or threatened by the introduction of technology in their tasks (Cragg and King, 2012).

Several researchers have found that compared to younger employees' older employees tend not to have the necessary qualifications and skills to use ICT systems deployed in their organizations (Cragg and King, 2012). Fink and Disterer (2006), researched on the relationship between ICT use and the age of the employee in a study done on American employees. Fink and Disterer (2006) found that employees younger than fifty years were more likely to adopt and use ICT than employees older than fifty years. Reynolds et al. (2014) study also found that employees aged below thirty five years were more likely to adopt and use ICT than employees above thirty five years of age in a study done on German male employees. Allison (1999) in her research found that younger employees are willing to learn and implement new technology compared to older employees', additionally probability of employees using complicated ICT system is lower amongst employees over forty years.

Lucchetti et al. (2006) conducted a study on the effects of ICT innovation on the salaries of older employees and employees who didn't have the skill to effectively use ICT. Their study revealed that salaries of older employees who were seen as not being ICT savvy were lower than younger employees who had acquired ICT skills and knowledge. There are only few studies, which analyze the relation between process innovation and the age of the employees. Allison (1999) researched the factors that affect process innovation in manufacturing companies. Allison's (1999) research found, that an increasing employee age, reduces the probability of manufacturing process innovation and development. Chang and Cheung (2001) researched on relationship

between age and ICT qualifications and its impact on ICT progress in Japanese organizations. Their research found no significant impact of old workers with high ICT skills on the rate of ICT progress in majority of organizations.

Beckinsale and Ram (2006) research found that education levels corresponds to employee level of adopting new innovation. Beckinsale and Ram (2006) further conclude that their ability to find sustainable solutions explains why people who are more educated are more willing to adopt and use new technology to improve their work output, and therefore the relationship between education and both ability to learn and attitudes towards ICT systems and innovation suggest that organizations that have implemented and use ICT systems are those that have more highly educated top management team (Sanchez, Martinez-Ruiz, and Jimenez-Zarco, 2007).

For organizations to fully benefit from the adoption and use of ICT, there also exist a need to invest in capacity building and skills training for their employees. Sanchez et al. (2007) revealed that, ICT training is a primary organizational factor because it helps users to understand how to best use and adopt ICT. Sanchez et al., (2007) research also showed that when companies neglect to train their employees, the skill deficit becomes a barrier to the adoption of ICT within the organization. Sanchez, et al., (2007) in their research found that the main barrier of ICT adoption amongst SME is the lack of awareness of the benefits to be derived from ICT implementation coupled with the lack of ICT training for the employees both at application and theoretical level.

2.3.4 Top Management Support Influence on Adoption of ICT Solutions

Top Management support of ICT factor refers to top management level of ICT knowledge and skill, education their willingness to adopt ICT solutions and their perception of ICT in relation to how it can help their companies gain a competitive advantage. According Chuang et al. (2007), support given by top managers and management in regard to ICT adoption, is important for the successful adoption of ICT solutions, thus a highly skilled and knowledgeable management is more likely to adopt ICT solutions. Some of top management factors that influence adoption of ICT solutions in organizations include: top manager characteristics, level of education, individual's ICT knowledge and skills, and social and cultural issues.

Other studies especially in developing economies have cited the importance of key managers and owners having basic knowledge of ICT (Silvius, 2004). In a study carried out in Indonesia, to ascertain the factors that drive adoption of ICT within SMEs, it was found that the level of ICT knowledge and attitude towards ICT of the owners of the companies, would determine whether that organization would be willing to adopt ICT (Utomo and Dodgson, 2001). A study done by Caldeira and Ward (2002), found that companies that had found success in adopting ICT systems and infrastructure, had top management who were willing to adopt new systems to improve work output, or had partnered with an IT firm that offered consulting services and managed their ICT infrastructure. There exists plenty of research that shows the importance of top management support to the successful implementation of ICT systems (Al-Qirim, 2004). Wojtkowski and Hardesty (2001) in their study revealed, that successful implementation of ICT initiatives within organizations, highly depend on their key managers being knowledgeable of new technological trends.

2.4 Technology Contribution on Productivity/Performance

ICT is at the core of most business functions, operations, products and services. Today, companies worldwide spend more than 50% of their new investment funds on IT related matters. According to Kariuki (2015), how organizations manage these large investments is of significance importance to organizational efficiency and effectiveness. Further, IT is often the bond between the business model and the vital drivers of success. Many organizations have been unsuccessful with their IT-based investments because of poor alignment of IT with the business.

In their research on influence of Information Technology on organizations' services and performance, Beckey, Elliot, and Procket, (2016) and McNutt, and Boland, (2009) asserts that IT plays a critical role in enhancing the quality and quantity of information. Different institutions assign their resources differently in a way that maximizes their objectives and those institutions that allocate more resources on IT perform exemplary than those firms that allocate less resources (McAfee and Brynjolfsson, 2008). Attainment of high performance also requires excellent IT infrastructure supported by good IT management practice (Mwania and Muganda, 2012).

Hitt and Brynjolfsson (1996) did a study on Effect of ICT in Oil Producing companies and found positive impact of ICT investments on productivity. Gable and Raman (2010) investigated on the effects of ICT on business operations and deduced that ICT is a significance pillar in driving company's day to day operations. Gakuo (2011) conducted a study on the impact of ICT at Nairobi Water & Sewerage Company and observed that its investments significantly increased the average organizational performance in realizing numerous milestones, overall returns

increment, improving research and development and product innovation. Kinuthia (2012) studied on the correlation between IT investment and performance of NGOs in Kenya and deduced that IT was crucial in the efforts to enhance performance. Waruguru (2012) explored the influence of ICT on performance of the airline industry in Kenya and deduced that ICT enhanced performance of the company to a greater extent. Kimani (2015) also found out that there was a positive relationship between the level of IT use and organizational performance at Population Services Kenya. The study results demonstrated that IT use explains 82.4% of organizational performance at Population Services Kenya.

2.5 Summary of gaps in the literature

Agboh (2015) carried out a study that tried to explore the vital drivers and constraints of ICTs adoption by SMEs in the Accra Metropolis of Ghana. The literature depicts that while there are numerous drivers of ICTs adoption by SMEs, there are similarly numerous constraints from several factors. SMEs that meaningfully utilize ICTs can compete efficiently in both domestic and global platforms. Comprehending the drivers, and constraints to ICT adoption by SMEs specifically in the developing countries, and in the Accra metropolis of Ghana in specific haven't been addressed well. This study sought to bridge this gap. A survey questionnaire was used to gather data from 189 employed MBA students from various SMEs in Accra, Ghana. Quantitative methods were used for data analysis. The study pointed the key challenges to ICT adoption as lack of internal capabilities, astronomical cost of ICTs, non-robust infrastructure, financial constraints, and limited information on suitable ICT solutions and lack of time to implement. The study also pinpointed the main drivers of ICT adoption as the urge to increase customer service

and responsiveness, increase ability to compete, improve overall communication, increase sales and profit, and to have better access to information.

Kilangi (2012) performed a study aimed at filling the empirical gap by studying the factors influencing or limiting ICT adoption and usage among SMEs in the tourism sector in Tanzania. A review of the literature depicted that there is little empirical research conducted in Tanzania emphasizing on adoption and usage of ICT among SMEs. Data collection was carried out in Tanzania. The key respondents were the individuals who were key decisions makers on matters related to ICT adoption and usage within their SMEs. In this regard, a questionnaire-based survey was used to collect data from 338 SMEs. The study conclusions revealed that the significant factors influencing business communication include: relative advantage, compatibility, complexity, organisational e-resources, top management support, competitive pressure and technological support. Online presence is influenced by relative advantage, complexity, organisational e-resources, top management support, competitive pressure and non-technological support. Online trading is influenced by compatibility, organisational e-resources, top management support, competitive pressure and technological support.

Mureithi (2013) carried out a study that intended to determine factors that influence implementation of Information and Communication Technology in smallholder dairy co-operatives in Kabete, Kiambu County. Casual descriptive research was adopted, and target population was the smallholder dairy cooperatives in Limuru, Kikuyu, Gatundu, Nderi, Gikambura, Ndumberi, and Sigona. Using purposive sampling, the study picked 41 respondents and data analysis done using Microsoft Excel 2007. The results pointed out that the

government's engagement in Information and Communication Technology implementation doesn't include controlling of cost even though it has invested in Information Communication and Technology infrastructures. It was determined that most dairy cooperatives in Kabete, Kiambu County do not have trained and motivated personnel for the usage of modern ICT technologies hence the need for training and assessment.

In her study, Mwitia (2017) investigated factors impacting implementation of ICT projects in Government Agencies looking specifically the influence of availability of infrastructural facilities, financial resources, assessing the influence of personnel competencies, investigating the command of Top Management support on implementation of ICT projects in Government Agencies in Nairobi County. The researcher applied stratified random sampling technique in selecting a sample size of 90 respondents from five Government Agencies. Data quality was observed especially during the data collection in that all the spoilt questionnaires were not considered. Descriptive statistics was employed to analyze data. Data was analyzed using SPSS and presented in tables and percentages. A total of 90 questionnaires were administered and the study managed to receive 75 completed questionnaires representing 83.3% return rate. The questionnaires covered questions on the objectives of the study. The study concluded that senior management ensured formation of effective communication structures to guarantee flow of communication. Project Management and leadership as a critical factor influencing implementation of ICT projects was addressed to a greater extent in Government Agencies in Nairobi County. The study findings also suggested that most ICT projects were undertaken and produced significant benefits in the Government Agencies to a very high extent.

A number of studies done on adoption of ICT such by: Mwangi (2013); Gathu (2017); Mokaya (2012); Kinuthia (2012); Mureithi (2013); and Mugwe (2010) have missed to give detailed insights on the factors influencing adoption of ICT solutions in dairy farming cooperative societies. Although the studies highlighted here attained their objectives, they did not delve into the factors affecting adoption of ICT solutions in dairy farming cooperative societies. There is paucity of published work on factors affecting adoption of ICT solutions in dairy farming cooperative societies, specifically in the context of developing countries in the dynamic African region and particularly in Kenya. This study intended to bridge this gap in knowledge that existed.

2.6 Conceptual Framework

Mugenda and Mugenda (2003) describes a conceptual framework as a hypothesized model identifying the concepts under study and how they relate. In the proposed framework, there are pertinent factors influencing ICT adoption in dairy farming cooperative societies in Meru County, Kenya. These factors include but are not restricted to; perceived cost of adoption, perceived usefulness, staff competencies/skills, and top management support. From literature reviewed, these factors seemed to be among prominent components affecting adoption of Information and Communication Technology in many sectors and industries hence the reason for their consideration in this study. This conceptual framework is backed by the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT) model, the innovation diffusion theory, and Resource-based View (RBV) theories in the adoption of ICT solutions in dairy farming cooperative societies in Meru County, as presented in Figure 2.1.

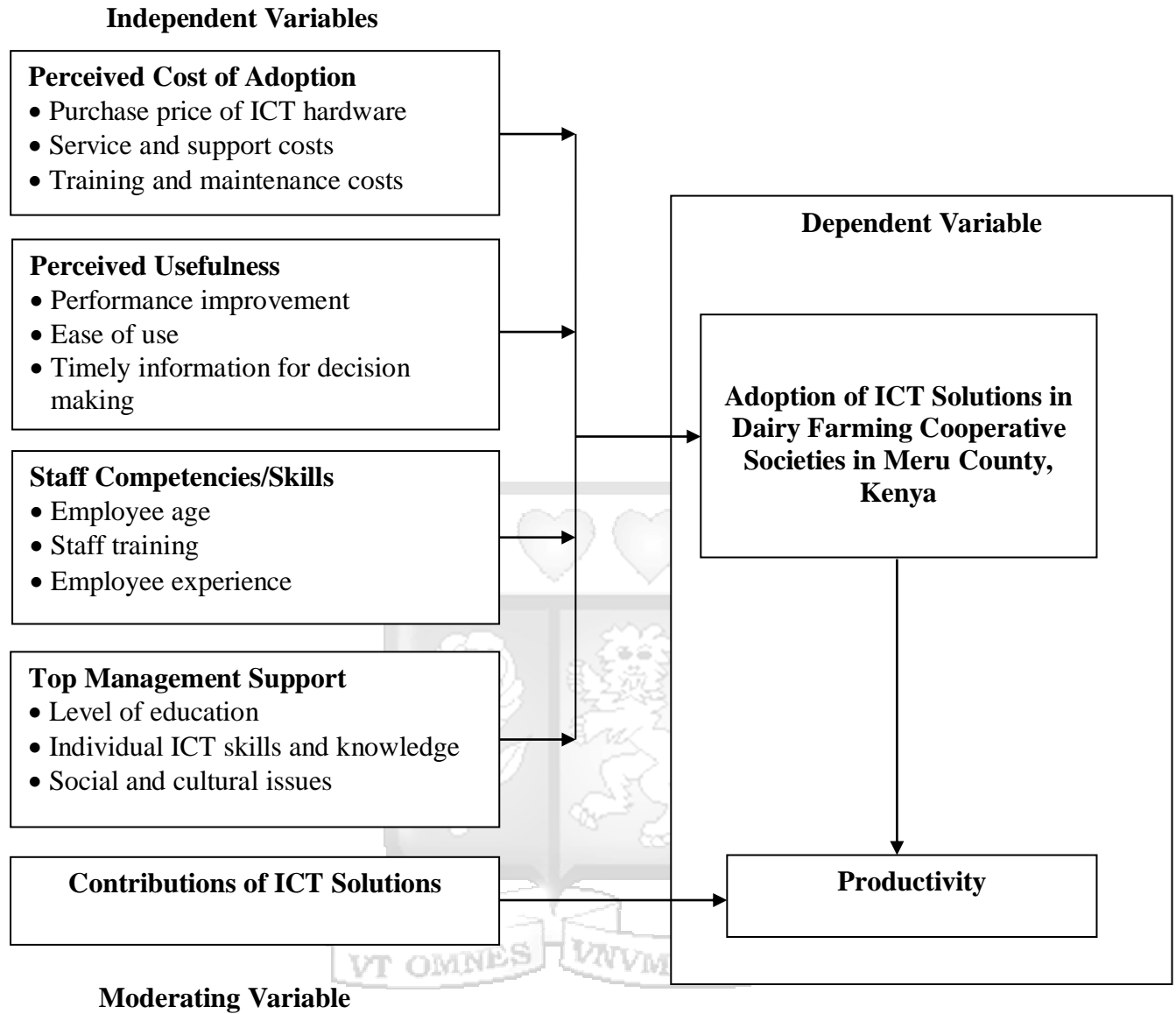


Figure 2.4: Conceptual Framework

Source: Researchers Own Conceptualization

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter identifies the procedures and techniques that were used in the collection, processing and analysis of data. The chapter comprises of research design, target population, sample design, data collection methods, data analysis, and ethical considerations.

3.2 Research Design

This study employed a descriptive research design. Kothari (2008) affirms that a descriptive research design is suitable where the research needs to draw conclusions from a larger population. Mugenda and Mugenda (2003) asserts that the objective of descriptive research is to establish and report the way things are and it helps in establishing the present situation of the subject under study. It is for these reasons that the design was considered for this study. This research design was beneficial when clarifying the results of the study and most importantly in relating independent and dependent variables (Harrison and Reilly, 2011).

3.3 Study Area and Target Population

This study was undertaken in Meru County. Meru County was chosen as it is among the top 5 milk producing region in Kenya. Budgetary constraints also informed the choice of study location. Furthermore, no study has been done in Meru regarding dairy cooperative societies, hence the reason why the study chose to focus on Meru. Meru Central Dairy Co-operative Union is a union with a well-structured list of dairy cooperatives in Meru County and hence this study used it to access the cooperative societies. The study involved 20 dairy cooperative societies registered under Meru Central Dairy Co-operative Union (MCDUCU, 2019) as listed in Appendix

IV. Cohen, Manion, and Morrison (2007) define a target population as a specific proportion of the entire population that can be narrowed to achieve research objectives. The research targeted general managers and IT managers of all 20 listed MCDCU dairy cooperative societies in Meru County. The target population was selected for the study because they are expected to be knowledgeable on adoption of ICT from their rank and experience.

3.4 Sample Design

A sample is a subset of the population. Cooper and Schindler (2014) define sampling as the process of choosing a number of individuals for a study in a way that they represent the larger group they are selected from. Selecting a sample is a key feature of any research undertaking. In this study however, no sampling was done given the number of respondents was small. A census survey of all general managers and IT managers of all 20 listed MCDCU dairy cooperative societies in Meru County was conducted. This implies that the study involved two (2) respondents from each society implying 40 respondents from the dairy cooperatives in Meru County. Since the target population was small in number, this study adopted a census of all the respondents as recommended by Cooper and Schindler (2014). The benefits of using this method are that it increases confidence interval, it has a maximum chance of identifying negative feedback and everyone is involved (Cooper and Schindler, 2014).

3.5 Data Collection Methods

This study collected data using a structured questionnaire. Questionnaires were preferable for this study because of the assumption that the respondents are literate to answer questions adequately and saves time and money (Kothari, 2009). The questionnaire had both closed and

open-ended questions. The questionnaire collected quantitative data and was divided into five sections. The questionnaires were administered physically, and the respondent filled the questionnaire as the researcher waited. Three well trained research assistants were recruited to help with administration of the questionnaires and ample time were given to respondents to fill the questionnaires which were collected upon completion.

3.5.1 Validity of the Questionnaire

Validity refers to evaluating whether a research instrument collects the data it attempts to gather (Bryman, 2012). In this study, there was deliberation on the final copy of the questionnaire with the supervisor and a statistician to establish both content and face validity. For content validity, expert opinion was sought to check and identify any shortfall of the research questionnaire in anticipation that it measures all it. For face validity, the expert checked the instruments structure, grammar, alignment and any other issue that would minimize chances of the questionnaire falling short of collecting the desired data.

3.5.2 Reliability of the Questionnaire

Reliability is the degree of consistency of a research instrument to measure a concept giving same results when performed on several occasions (Bryman, 2012). Cronbach's Coefficient Alpha approach was used as recommended by Cohen, Manion, and Morrison (2007) to test reliability of the data. Cronbach's alpha coefficient ranges between 0 and 1 with higher alpha values of <0.5 being unacceptable, 0.5 to 0.6 being poor, 0.6 to 0.7 being questionable, 0.7 to 0.8 being acceptable, 0.8 to 0.9 being good, and above 0.9 being excellent. The questionnaires had a reliability index of 0.84 and were therefore accepted.

3.6 Data Analysis

The collected data was coded and checked for any errors and omissions. Data was analyzed using the Statistical Package for Social Sciences (SPSS) software version 24.0. Responses from the questionnaires were analyzed for descriptive statistics. The descriptive statistics output were presented as percentages and frequency of responses. Frequency tables, bar graphs and pie charts were used to present the findings using frequency distribution. Inferential statistics such as correlation analysis and regression analysis were carried out to determine the relationship between the variables.

3.7 Ethical Considerations

Even as this study aimed at adding value to the sector of ICT and business administration, respondent's confidentiality was upheld. An introduction letter from the university and a research permit from National Commission for Science, Technology and Innovation (NACOSTI) were obtained. Ethical approval was done by Strathmore University Ethical Review Board. All approvals were presented to the prospective respondents. Verbal consent was sought from the participants to indicate willingness to participate before commencement of the study. All forms of plagiarism were avoided through proper referencing of all sources used.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

In this chapter, key issues related to data presentation, analysis and interpretation have been discussed. This chapter presents responses from dairy farming cooperative societies in Meru County, Kenya regarding factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. First, the research response rate was computed and presented. Secondly, the demographic characteristics of the participants have been described. Thirdly, the findings on the four key objective areas of the study have been presented and interpreted. The responses were analyzed using descriptive and inferential statistics. The data has been presented in tables, graphs and pie charts.

4.2 The Study Response Rate

Out of 40 questionnaires which had been administered to the interviewees, 33 of them were returned for analysis. This translates to 82.5 percent return rate of the respondents. Overall, the response rate was considered very high and adequate for the study as shown in Table 4.1;

Table 4.1: Distribution of the Respondents by Responses Rate

Response Rate	Frequency (F)	Percentage (%)
Returned	33	82.5
Not Returned	7	17.5
Issued	40	100.0

Source: Research data (2019)

4.3 Demographic Characteristics of the Respondents

The study sought to find out the distribution of the respondents by their gender. The findings are shown below in Figure 4.1

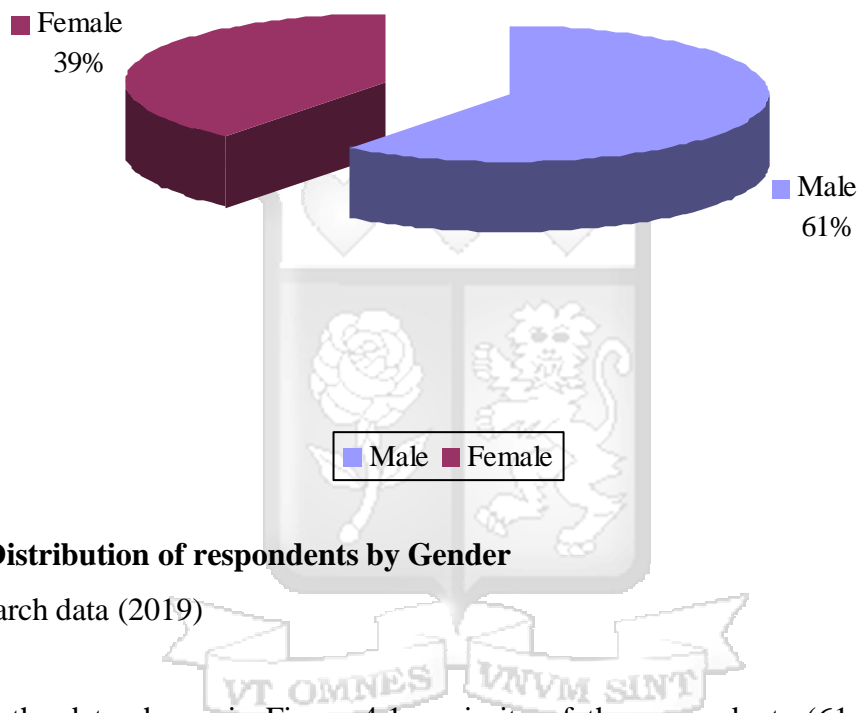


Figure 4.1: Distribution of respondents by Gender

Source: Research data (2019)

According to the data shown in Figure 4.1, majority of the respondents (61.0%) were males while 39.0% were female. The findings could be an indication that most of the managers of dairy farming cooperative societies in Meru County, Kenya are male. The finding could imply that Meru dairy cooperative societies are dominated by male.

The study sought to find out the distribution of the respondents by age. The findings are tabulated in Table 4.2

Table 4.2: Distribution of the Respondents by Age

Age	Frequency (F)	Percentage (%)
20-30 years	0	0.0
30-40 years	14	42.4
40-50 years	13	39.4
50 and above years	6	18.2
Total	33	100.0

Source: Research data (2019)

It is seen from the data shown in Table 4.2 that, most of the interviewees (42.4%) were under the age bracket of 30-40 years, 40-50 years (39.4%) and 50 and above years (18.2%). The findings shows that respondents are the general managers and IT managers of dairy farming cooperative societies in Meru County, Kenya are middle aged between 30 to 40 years. The results provide an implication that majority of ICT heads are younger people who probably are conversant with systems and new technologies.

The study sought to find out the distribution of the respondents by education level. The findings are shown in Figure 4.2

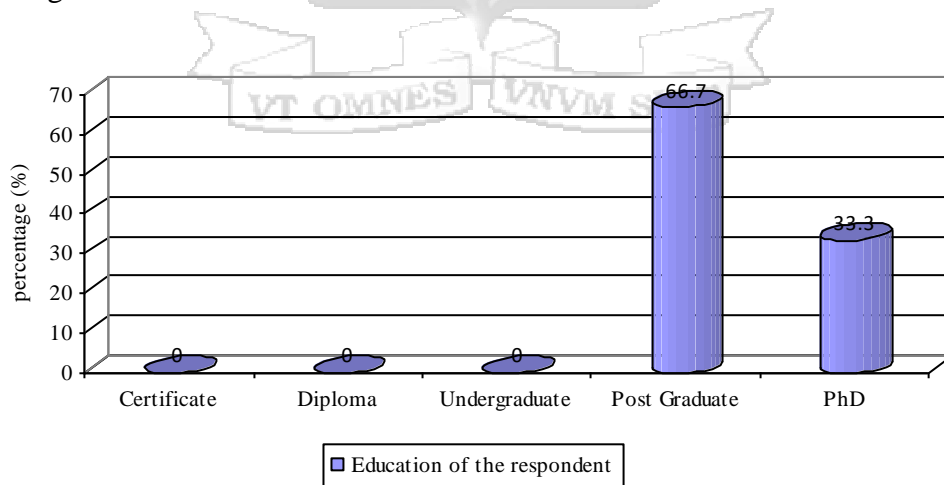


Figure 4.2: Education level of the Respondents

Source: Research data (2019)

Figure 4.2 shows that majority of the respondents represented by 66.7 have attained postgraduate level of education, and 33.3% have attained PhD level of education. This could mean that majority of the general managers and IT managers are learned and well skilled for their current positions.

The study sought to find out the duration the respondent has worked with the cooperative. The findings are tabulated on Table 4.3:

Table 4.3: Duration the Respondent has worked with the Cooperative

Duration	Frequency (F)	Percentage (%)
Below 1 years	2	6.1
1 to 3 years	4	12.1
3 to 4 years	10	30.3
More than 4 years	17	51.5
Total	33	100.0

Source: Research data (2019)

It is evident from the data shown in Table 4.3 that, majority of the interviewee have been in employment with their cooperative for a period of over 4 years (51.5%). The findings also show that a significant number of respondents have been working with the cooperative for 3 to 4 years (30.3%), 1 to 3 years (12.1%), and below 1 years (6.1%). The findings could imply that the respondents have worked with the cooperative for a long enough and climbed the ranks over time. The findings give an implication that the respondents are quite knowledgeable and are conversant with the topic at hand quite well.

The study sought to find out how long the dairy cooperative society been in existence. The findings are presented in Figure 4.3.

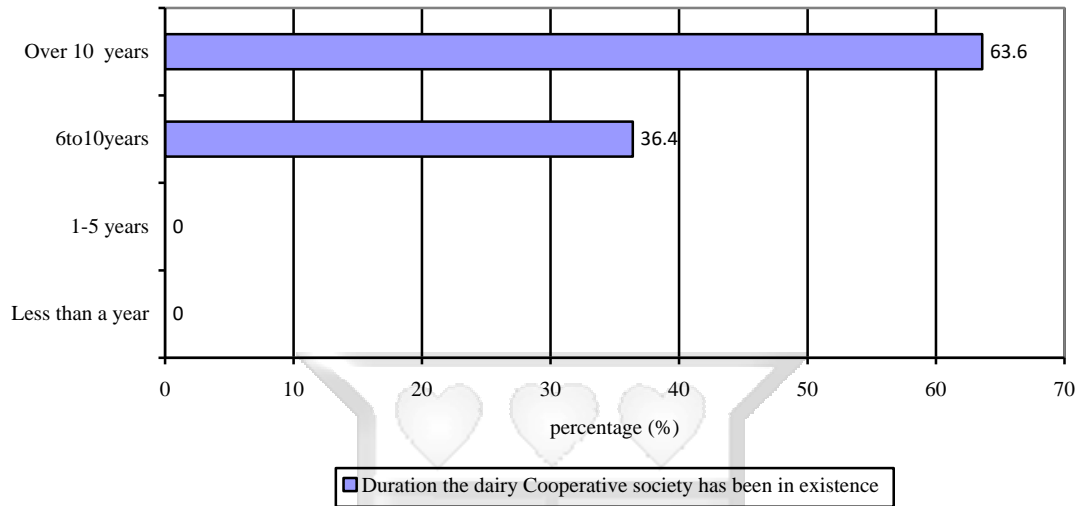


Figure 4.3: Duration the dairy cooperative society has been in existence

Source: Research data (2019)

Figure 4.3 shows that majority of the respondents (63.6%) indicated that the dairy farming cooperative societies in Meru County, Kenya have been in existence for more than 10 years while 36.4% indicated that the dairy cooperative societies in Meru County have been in existence for 6-10 years.

The study sought to find out the number of employees of the company. The findings are tabulated on Table 4.4:

Table 4.4: Number of employees

	Frequency (F)	Percentage (%)
0-10	0	0.0
11-20	0	0.0
21-30 employees	13	39.4
More than 30 employees	20	60.6
Total	33	100.0

Source: Research data (2019)

It is obvious from the data shown in Table 4.4 that, most of the dairy farming cooperative societies in Meru County, Kenya have more than 30 employees while 39.4% pointed out that the dairy farming cooperative societies in Meru County, Kenya have between 21-30 employees. The number of employees working for the dairy cooperative societies suggests the need to have ICT in place to support communication channels.

4.4 Contribution of ICT to Cooperatives Productivity

The study sought to find out if dairy cooperative society has adequately adopted ICT solutions.

The findings are shown in Figure 4.4

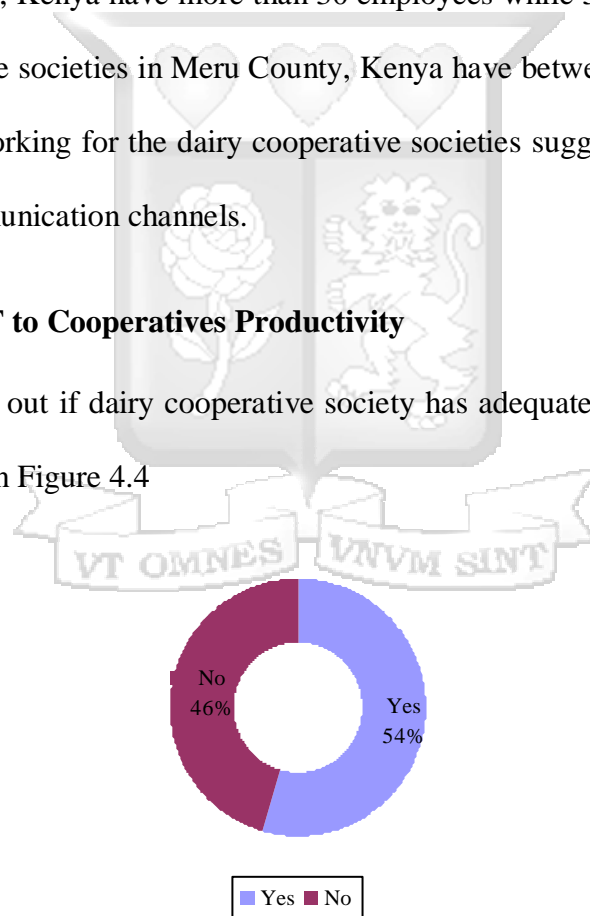


Figure 4.4: Adequate adoption of ICT solutions by dairy cooperative society

Source: Research data (2019)

The results in Figure 4.4 indicate that slightly more than half of the respondents (54.5%) agreed dairy cooperative society has adequately adopted ICT solutions. However, a significant number of respondents (45.5%) disagreed that dairy cooperative society has adequately adopted ICT solutions.

The study further sought to find out if ICT contribute to the productivity of dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.5.

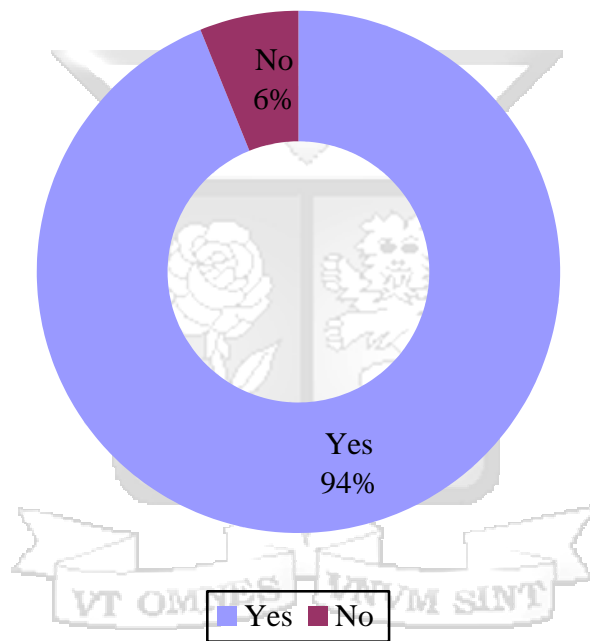


Figure 4.5: ICT contribution to the productivity of dairy cooperative societies

Source: Research data (2019)

Figure 4.5 reveals that majority of the respondents (94.0%) agreed ICT contribute to the productivity of dairy cooperative societies in Meru County, Kenya while 6.0% disagreed. The findings depict that ICT has a lot of benefits to an organization and hence should be fully embraced.

The study sought to find out the extent to which ICT contribute to the productivity of dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.6

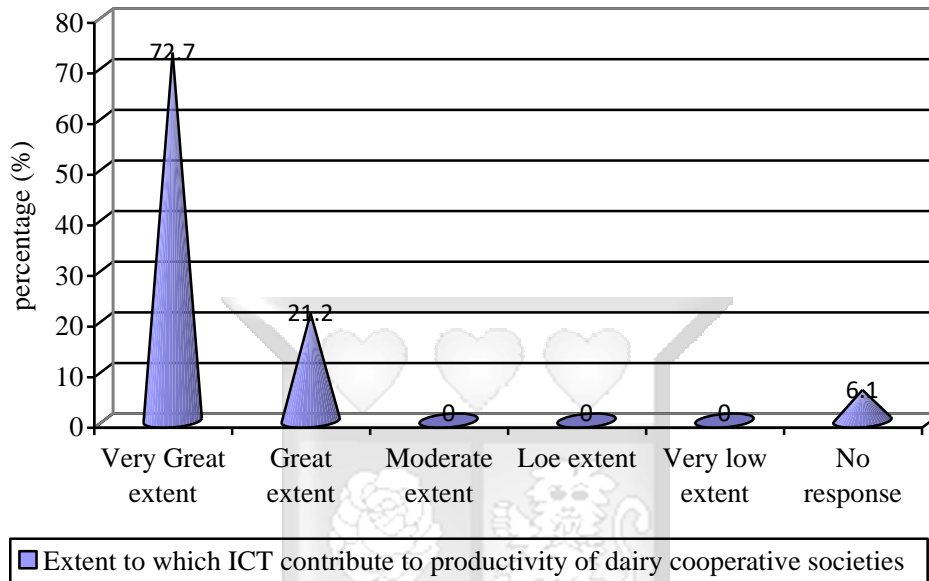


Figure 4.6: Extent to which ICT contribute to productivity of dairy cooperative societies

Source: Research data (2019)

The findings on Figure 4.6 indicate that more than half (72.7%) of the respondents agreed to a very great extent that ICT contribute to the productivity of dairy cooperative societies in Meru County, Kenya while 21.2% agreed to a great extent ICT contribute to the productivity of dairy cooperative societies in Meru County, Kenya. However, 6.1% of the respondents did not respond to the question. The findings depict the importance and significance of ICT to the productivity of dairy cooperative societies.

The areas in which ICT has contributed to productivity/performance of the cooperative society include: receiving updated information online, reduced job duplication, organized and less file storage, enhanced communication internally and externally, support for milk procurement, milk payment, helping in inventory and records keeping, enhancing accounting systems, and ICT implementation has led in strategic planning roles. The findings are in line with Neelameghan (2005) and Kumar (2012) who stated that similar benefits or contributions ICT brings to an organization.

The study aimed to establish the extent of agreement to the following statements with regards to benefits of ICT and productivity within the framework of the cooperative. The statements were rated on a five-point Likert scale ranging from Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). The findings are tabulated in Table 4.5.

Table 4.5: ICT and productivity within the context of the cooperative

	SD		D		N		A		SA		Mean	SDV
	N	%	N	%	N	%	N	%	N	%		
ICT has helped reduce wastage in my organization	0	0.0	0	0.0	0	0.0	6	18.2	27	81.8	4.82	0.392
ICT adoption has lessened time taken to carry out tasks	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.00
ICT has helped in monitoring performance	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.00
ICT has encouraged exploration and support of innovation	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.00
ICT has made work more flexible	0	0.0	0	0.0	0	0.0	4	12.1	29	87.9	4.88	0.33
Quality of work has improved due to ICT	0	0.0	0	0.0	2	6.1	3	9.1	28	84.8	4.79	0.545
Communication within and outside the company has improved due to ICT	0	0.0	0	0.0	0	0.0	4	12.1	29	87.9	4.88	0.33
ICT has enabled easy coordination within the company	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.00

The results in Table 4.5 indicate that, majority of respondents strongly agreed that: ICT adoption has lessened time taken to carry out tasks (M= 5.00), ICT has helped in monitoring performance (M= 5.00), ICT has encouraged exploration and support of innovation (M= 5.00), ICT has enabled easy coordination within the company (M= 5.00), communication within and outside the company has improved due to ICT (M= 4.88), ICT has made work more flexible (M= 4.88), quality of work has improved due to ICT (M= 4.79) and ICT has helped reduce wastage in my organization (M= 4.82) are statements regarding benefits of ICT and productivity within the context of the organization. The findings here reveal the significance of ICT to productivity of an organization.

4.5 Perceived Cost

The study sought to find out if cost of ICT influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.7

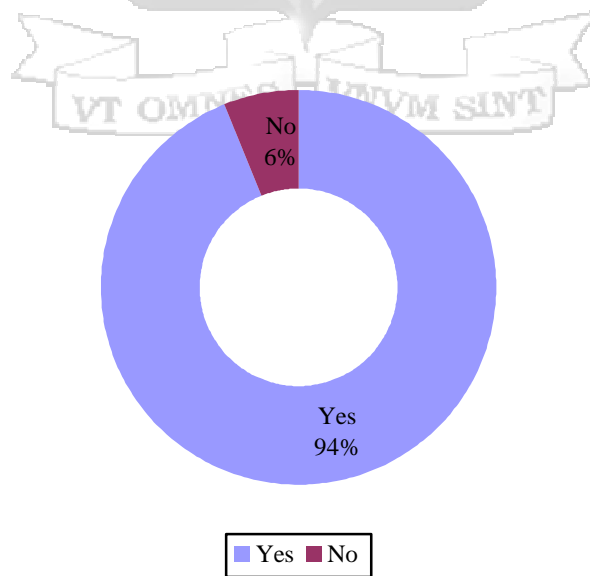
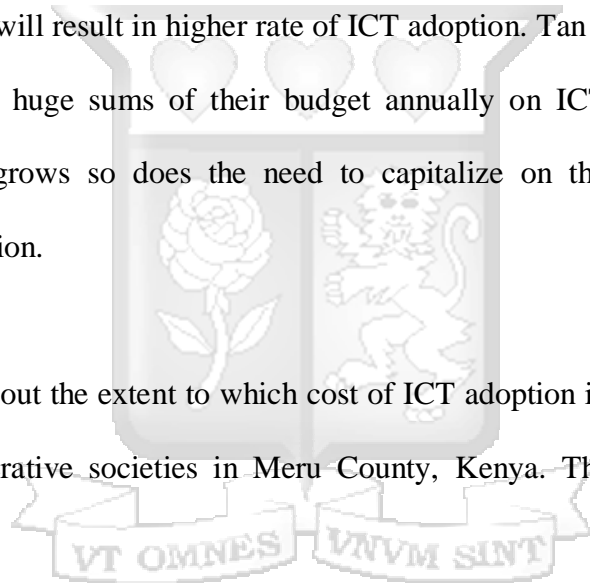


Figure 4.7: Cost of ICT on adoption of ICT solutions in dairy cooperative societies

Source: Research data (2019)

Figure 4.7 reveals that majority of the respondents (94.0%) agreed that cost of ICT adoption influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya while 6.0% disagreed. Ernst and Young (2012) established that the cost related to adoption of ICT solutions is a factor that influences an organizations behavior of adoption. Seyal & Rahim (2006) found a significant relationship between cost and adoption of technology. Reducing the cost of ownership of ICT assets will result in higher rate of ICT adoption. Tan and Wu (2003), highlight that organizations spend huge sums of their budget annually on ICT systems and platforms though as competition grows so does the need to capitalize on the competitive advantage resulting from ICT adoption.

The study sought to find out the extent to which cost of ICT adoption influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.8



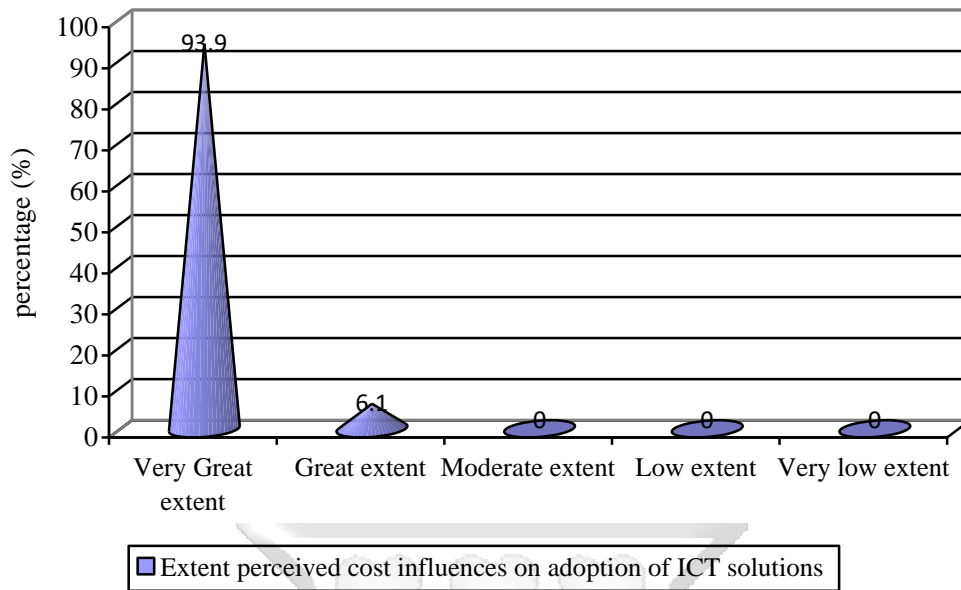


Figure 4.8: Extent perceived cost influences adoption of ICT solutions

Source: Research data (2019)

The findings on Figure 4.8 indicate that almost all (93.9%) of the respondents agreed to a very great extent that cost of ICT adoption influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya while 6.1% agreed to a great extent that cost of ICT adoption influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

The study sought to find out the extent of agreement to the following statements regarding perceived cost influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The statements rated on a five point Likert scale ranging from Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). The findings are tabulated in Table 4.6.

Table 4.6: Extent perceived cost

	SD		D		N		A		SA		Mean	SDV
	N	%	N	%	N	%	N	%	N	%		
ICT projects are easily funded in my organization	0	0.0	16	48.5	9	27.3	8	24.2	0	0.0	2.76	0.830
My organization has a set budget for ICT projects	0	0.0	5	15.2	3	9.1	25	75.8	0	0.0	3.61	0.747
The cost of ICT solutions and maintenance is high	0	0.0	0	0.0	0	0.0	4	12.1	29	87.9	4.88	0.331

Source: Research data (2019)

The results in Table 4.6 indicate that, majority of respondents strongly agreed that the cost of ICT solutions and maintenance is high (M= 4.88), and further agreed that the organization has a set budget for ICT projects (M= 3.61) as statements regarding perceived cost influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. However, M= 2.76 of the respondents disagreed with the statement that ICT projects are easily funded in their organization as a statement regarding perceived cost influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

4.6 Perceived Usefulness

The study further sought to find out if perceived usefulness influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.9

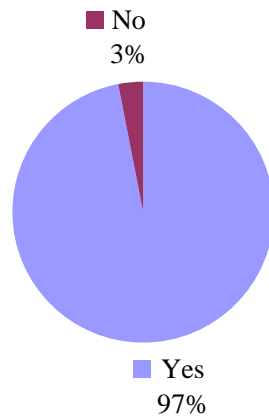


Figure 4.9: Perceived usefulness influence on adoption of ICT solutions

Source: Research data (2019)

Figure 4.9 reveals that majority of the respondents (97.0%) agreed that perceived usefulness influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya while 3.0% disagreed. The findings support Otieno (2015) who noted that perceived usefulness is also seen as the improvement in performance that an individual believes he can acquire when using a technology. The usefulness of the technology is related to the perception of the person who uses it in performing his or her work (Davis, 2013). Otieno (2015) posits that the acceptance of ICT is influenced by the perception of their potential users. The more they are convinced that their use is improving their performance, the more they adopt and incorporate them in their work. Bukhari (2008) confirms the findings that perceived usefulness is a determinant of adoption and use of technologies by stating that the pre-adoption attitude of users is based on the perceptions of the utility of the technology.

The study sought to find out the extent to which perceived usefulness influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.10

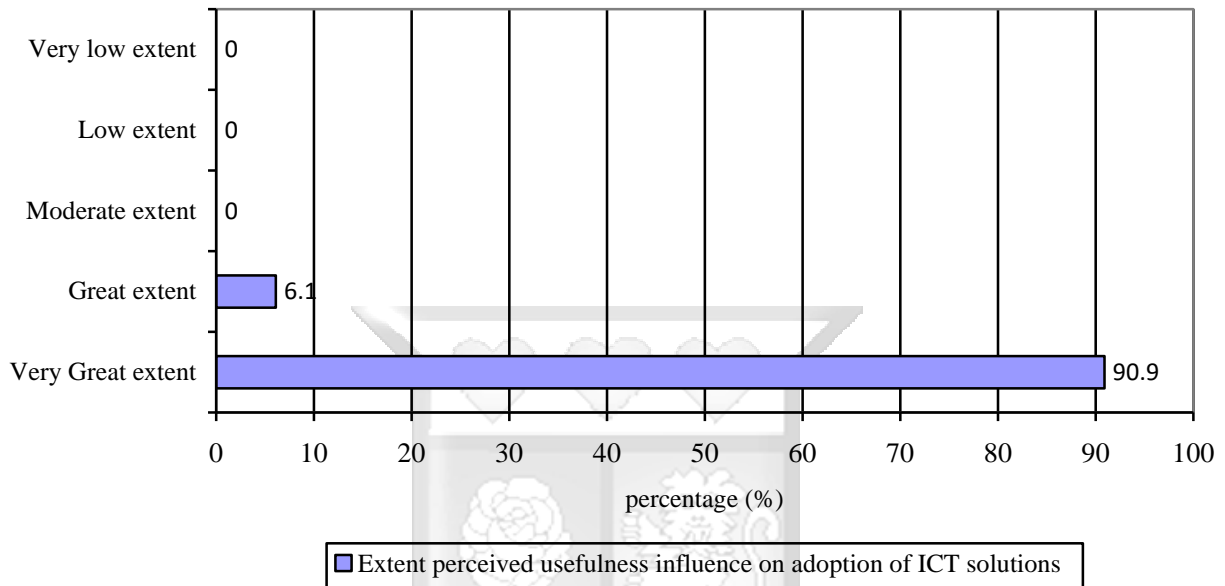


Figure 4.10: Extent perceived usefulness influence adoption of ICT solutions

Source: Research data (2019)

The findings on Figure 4.10 indicate that more than half (90.9%) of the respondents agreed to a very great extent that perceived usefulness influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya while 6.1% agreed to a great extent that perceived usefulness influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

The study aimed at finding out the extent of agreement to the following statements regarding perceived usefulness as an influence on adoption of ICT solutions in dairy cooperative societies

in Meru County, Kenya. The statements were rated on a five-point Likert scale ranging from Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). The findings are tabulated in Table 4.7.

Table 4.7: Extent perceived usefulness

	SD		D		N		A		SA		Mean	SDV
	N	%	N	%	N	%	N	%	N	%		
ICT solutions in my organization have improved productivity	0	0.0	1	3.0	3	9.1	14	42.4	15	45.5	4.30	0.770
ICT systems have improved communication within the organization	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.000
ICT systems have improved communication with members	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.000
ICT solutions have improved business processes and work flow	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.000
ICT solutions have had a positive impact on profitability	0	0.0	0	0.0	8	24.2	5	15.2	20	60.6	4.36	0.859

Source: Research data (2019)

The results in Table 4.7 indicate that, majority of respondents strongly agreed that ICT systems have improved communication within the organization (M= 5.00), ICT systems have improved communication with members (M= 5.00), ICT solutions have improved business processes and work flow (M= 5.00), ICT solutions have had a positive impact on profitability (M= 4.36) and ICT solutions in my organization have improved productivity (M= 4.30) are statements regarding perceived usefulness influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

4.7 Staff Competencies/Skills and Adoption of ICT Solutions

The study further sought to find out whether staff competency/skill influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in

Figure 4.11

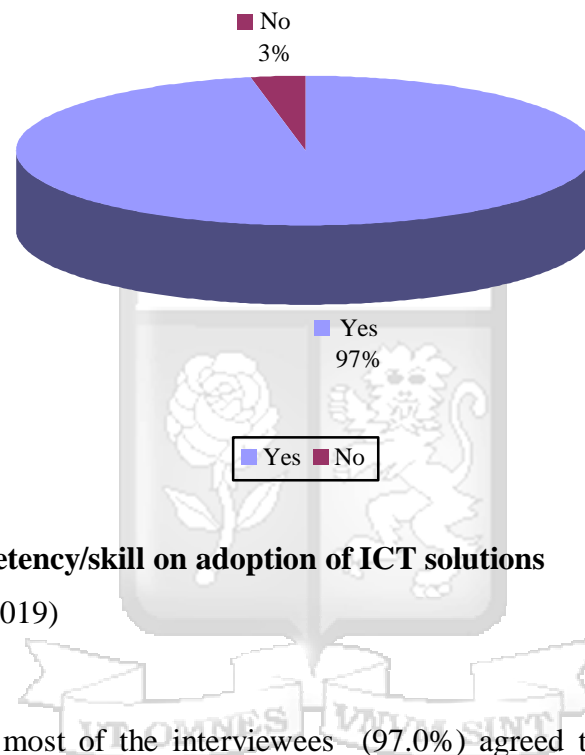


Figure 4.11 Staff competency/skill on adoption of ICT solutions

Source: Research data (2019)

Figure 4.11 shows that most of the interviewees (97.0%) agreed that staff competency/skill influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya while 3.0% disagreed. The findings support Reynolds, Savage and Williams (2014) who in their study found that SME owners and senior managers are less likely to adopt ICT if their staff are not accustomed with the common ICTs used in the business environment. This happens because SMEs may not be able to recruit or train staff so that they may obtain the skills and knowledge needed to assist the company adopt and use ICT (Reynolds et al., 2014). The lack of skilled employees and managerial staff with enough ICT knowledge is a critical factor that determines

the implementations and use of ICT (Alberto and Fernando, 2007). Allison (1999) found that When companies have skilled and knowledgeable employees their ability to adopt and use ICT increases, thus leading to successful adoption of ICT in their organizations.

The study sought to find out the extent to which staff competency/skill influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.12

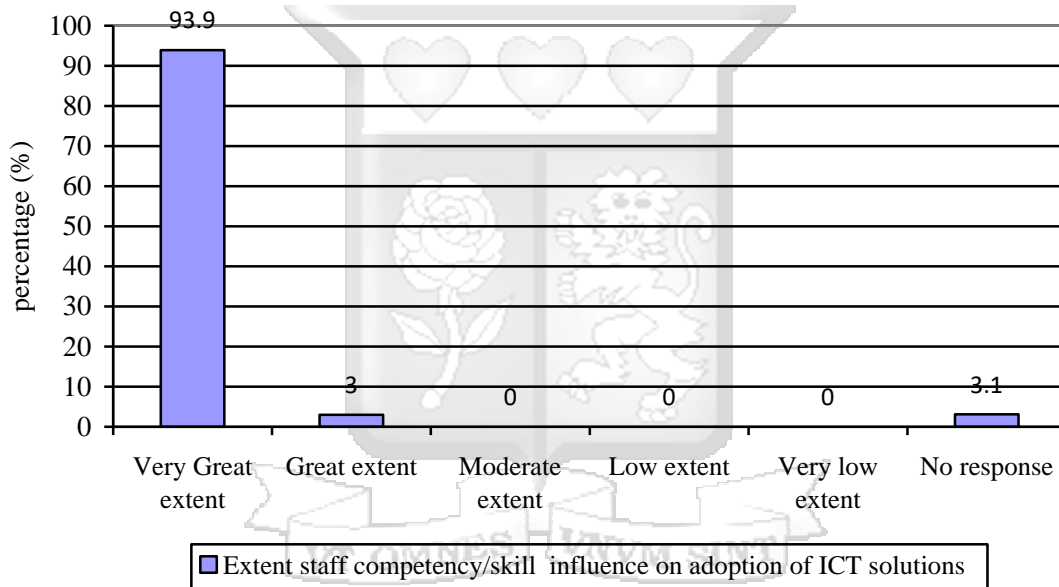


Figure 4.12: Extent staff competency/skill influence adoption of ICT solutions

Source: Research data (2019)

The findings on Figure 4.12 indicate that more than half (93.9%) of the respondents agreed to a very great extent that staff competency/skill influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya while 3.0% agreed to a great extent that staff

competency/skill influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

The study aimed at finding out the extent of agreement to the following statements regarding staff competency/skill influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The statements were rated on a five-point Likert scale ranging from Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). The findings are tabulated in Table 4.8.

Table 4.8: Extent staff competency/skill

	SD		D		N		A		SA		Mean	SDV
	N	%	N	%	N	%	N	%	N	%		
Employees in my organization easily adapt to new ICT solutions	0	0.0	0	0.0	3	9.1	20	60.6	10	30.3	4.21	0.600
Employees in my organization are technology savvy	0	0.0	9	27.3	3	9.1	2	6.1	19	57.6	3.94	1.345
Employees in my organization are trained on newly acquired ICT systems	0	0.0	0	0.0	0	0.0	22	66.7	11	33.3	4.33	0.479
A number of employees in my organization have a background in IT	0	0.0	19	57.6	4	12.1	4	12.1	5	18.2	2.91	1.208
We have an adequate technical team to administer ICT solutions	0	0.0	0	0.0	0	0.0	16	48.5	17	51.5	4.52	0.508

Source: Research data (2019)

The results in Table 4.8 indicate that, majority of respondents strongly agreed that employees in the organization are technology savvy (M= 3.94) as a statement regarding staff competency/skill influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. A large proportion of the respondents agreed that: employees in the organization are trained on newly acquired ICT systems (M= 4.33), employees in the organization easily adapt to new ICT solutions (M= 4.21), and they have an adequate technical team to administer ICT solutions (M= 4.52) as statements regarding staff competency/skill influence on adoption of ICT solutions in

dairy cooperative societies in Meru County, Kenya. However, a large proportion of the respondents disagreed that: a number of employees in the organization have a background in IT (M= 2.91) is a statements regarding staff competency/skill influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

4.8 Top Management Support

The study further sought to find out whether top management support influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.13.

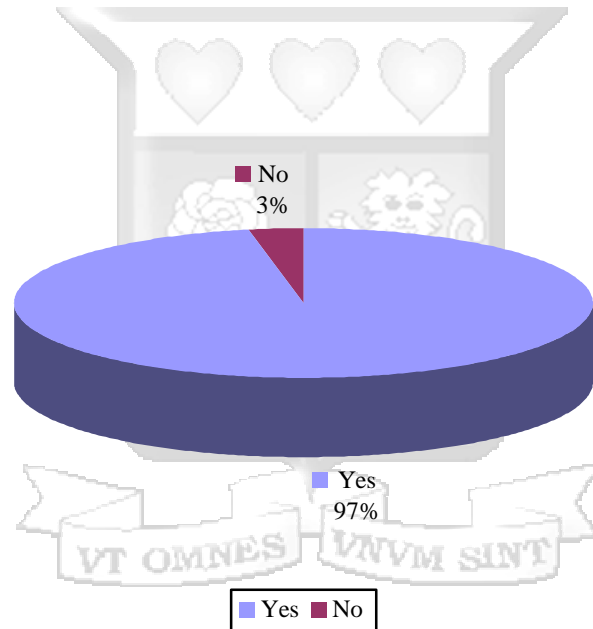


Figure 4.13 Influence of top management support on adoption of ICT solutions

Source: Research data (2019)

Figure 4.13 reveals that majority of the respondents (97.0%) agreed that top management support influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya while 3.0% disagreed. According Chuang et al. (2007), support given by top managers and management in regard to ICT adoption, is important for the successful adoption of ICT solutions,

thus a highly skilled and knowledgeable management is more likely to adopt ICT solutions. A study done by Caldeira and Ward (2002), found that companies that had found success in adopting ICT systems and infrastructure, had top management who were willing to adopt new systems to improve work output, or had partnered with an IT firm that offered consulting services and managed their ICT infrastructure. Wojtkowski and Hardesty (2001) in their study revealed, that successful implementation of ICT initiatives within organizations, highly depend on their key managers being knowledgeable of new technological trends.

The study sought to find out the extent to which top management support influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The findings are shown in Figure 4.14.

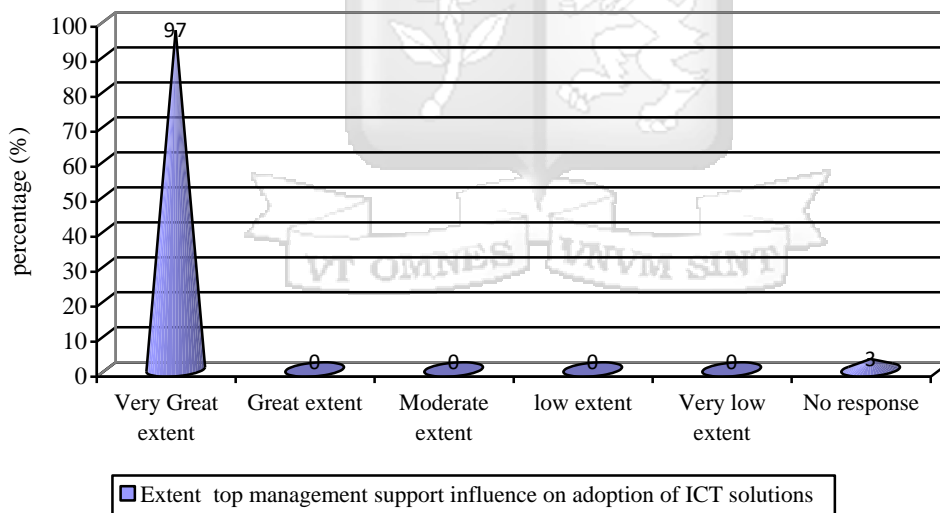


Figure 4.14: Extent top management support influence adoption of ICT solutions

Source: Research data (2019)

The findings on Figure 4.14 indicate that almost all (97.0%) the respondents agreed to a very great extent that top management support influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

The study aimed at finding out the extent of agreement to the following statements regarding senior management support's influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The statements were rated on a five-point Likert scale ranging from Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA).

The findings are tabulated in Table 4.9.

Table 4.9: Extent top management support

	SD		D		N		A		SA		Mean	SDV
	N	%	N	%	N	%	N	%	N	%		
Management of our cooperative view ICT as a strategic resource	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.000
Our cooperative management encourages staff to be ICT proficient	0	0.0	0	0.0	0	0.0	4	12.1	29	87.9	4.88	0.331
Management of our cooperative allocates budget for ICT solutions	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.000
Our cooperative management supports ICT projects in the organization	0	0.0	0	0.0	0	0.0	0	0.0	33	100.0	5.00	0.000

Source: Research data (2019)

The results in Table 4.9 indicate that, majority of the respondents agreed that management of the cooperative view ICT as a strategic resource (M= 5.00), Management of the cooperative allocates budget for ICT solutions (M= 5.00), cooperative management supports ICT projects in the organization (M= 5.00), and cooperative management encourages staff to be ICT proficient (M= 4.88) as statements regarding top management support influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

A significant number of respondents indicated that ICT contributed to the operations of the dairy farming cooperative societies in Meru County, Kenya through: receiving updated information online, reduced job duplication, organized and less file storage, enhanced communication internally and externally, support for milk procurement, milk payment, helping in inventory and records keeping, enhancing accounting systems, and ICT implementation has led in strategic planning roles. The findings are in line with Neelameghan (2005) and Kumar (2012) who stated the benefits or contributions ICT brings to an organization.

Most of the respondents cited cost of ICT technologies especially modern hardware and software is a leading challenge towards ICT adoption by dairy cooperatives in Meru County. Cost of implementation that includes staff trainings is also a challenge that hinders uptake and adoption of ICT. A significant number of respondents indicated that lack of understanding of the perceived usefulness on the benefits and contributions brought by ICT was also a leading challenge to dairy cooperative in Meru County. Majority of the respondents cited lack or poor top management support hinders ICT adoption as priorities in budget allocations are channeled elsewhere. A significant number of respondents indicated that slow penetration of ICT to other towns and rural areas is a challenge to ICT adoption and hinders development. Lack of knowledge, expertise, or organizational capacity needed in the dairy cooperatives was also cited as a challenge towards ICT adoption by dairy cooperatives in Meru County.

4.9 Suggestions/recommendations towards factors affecting adoption of ICT solutions

The study sought to find out the suggestions/recommendations towards factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. The responses given include: the need for adequate financing to be given to dairy cooperatives in Kenya to enable them to afford and adopt modern technologies to improve the agriculture sector hence developing the economy. The government needs to ensure that ICT infrastructure is evenly distributed across the country to all towns so as to reduce the cost of ICT adoption and access. There is also need for adequate ICT awareness and training to dairy cooperative staff and their members who are farmers aimed at enhancing participation in the ICT implementation process.

There is need for the management of dairy cooperatives to communicate the usefulness of ICT adoption and ease of use to its staff and members. This will play a big role in enhancing performance improvement. Employees of the dairy cooperatives will embrace ICT in carrying out their tasks bringing out the benefits therein leading to boost in performance and productivity. Dairy farmers should be informed on the benefits of ICT in monitoring the progress of cooperatives, so they can embrace the need to enhance the implementation of ICT projects. They should be able to understand the efficiency ICT brings to them in regard to milk collection and payment process.

The study further recommends that management of dairy cooperatives need to recruit and train their employees in a bid to motivate them to embrace and use modern ICT technologies to benefit the most from the implemented ICT. There is need for dairy cooperatives in Kenya to invest in more ICT development opportunities and involve more employees to equip them with

skills. The government should monitor experienced and qualified personnel offering ICT services in dairy cooperatives to ensure that they implement ICT in dairy cooperatives for good dairy farming business.

The study recommends the need for top management support in regard to ICT opportunity development. Support by management leads to proper financing for ICT technologies and approvals of staff trainings for ICT, as well as creating awareness of perceived usefulness of ICT to staff and members. Management will be able to use technologies to improve their performance and in the same time work on the cooperative's productivity. The perceived benefits of ICT will be able to come out clearly overtime.

4.10 Correlation analysis

Table 4.10: Correlation Analysis

		Adoption of ICT	Cost of Adoption	Perceived Usefulness	Staff Competency	Top Management Support
Adoption of ICT	Pearson Correlation	1				
Cost of Adoption	Pearson Correlation	.278	1			
Perceived Usefulness	Pearson Correlation	.194	.045	1		
Staff Competency	Pearson Correlation	.494	.045	.031	1	
Top Management Support	Pearson Correlation	.461	.455	.111	.031	1

The Pearson's correlation co-efficient of factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya and cost of adoption of ICT (0.278),

Perceived Usefulness (0.194), Staff Competency (0.494) and Top Management Support (0.461). These coefficients indicate that there is a positive correlation of, cost of adoption of ICT (27.8%), Perceived Usefulness (49.4%), Staff Competency (49.4%) and Top Management Support (46.1%) to factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. This positive correlation implies that when a factor increases, adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya increases too.

4.11 Regression Analysis

Regression analysis was done to determine the significant relationship between the factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. The results are presented in Table 4.11.

Table 4.11: Regression Results for adoption of ICT solutions in dairy cooperative societies

Model		Coefficients ^a			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients Beta		
		B	Std. Error			
1	(Constant)	1.962	.654		2.998	.974
	Cost of Adoption	.607	.218	.210	.701	.024
	Perceived Usefulness	.716	.303	.276	2.367	.021
	Staff Competency	.527	.344	.232	1.270	.047
	Top Management Support	.693	.506	.135	.776	.022
a. Dependent Variable: Adoption of ICT solutions						
R= 0.726						
R square=0.527						
F(5,27)= 3.830 at level of significance p = 0.023<0.05						

The study findings show that r is equal to 0.726, indicating that ICT contribution, cost of adoption of ICT, perceived usefulness, staff competency, and top management support are factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. The value of R squared is 0.527, indicating that, cost of adoption of ICT, perceived usefulness, staff competency, and top management support explains 52.7% of the variation in the factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya.

The table shows the constant in this model is represented by a value of 1.962, which is the expected value of factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya when the values of the independent variables are equal to zero. Perceived Usefulness was found to be the most (0.716) significant among the four variables followed by top management support (0.693), cost of adoption (0.607), staff competency (0.527). From the coefficients Table, it is evident that the p-values for cost of adoption of ICT (0.024), perceived usefulness (0.021), staff competency (0.047) and top management support (0.022) are less than 0.05. This therefore means that, cost of adoption of ICT, perceived usefulness, staff competency, and top management support are statistically significant, and they therefore influence the overall adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. Therefore, cost of adoption of ICT, perceived usefulness, staff competency, and top management support have a statistically significant influence on the adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The basic purpose of this chapter is to give the summary of the findings, conclusions and recommendations of the study. This was based on the research findings that is presented and discussed in the previous chapters. The study established several findings which make a direct contribution to knowledge and policy formulation. Recommendations both for further research as well as policy and practice have been made.

5.2 Summary of the Findings

This study aimed at exploring the factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. The task was to; identify and assess the factors that influence absorption of Information and Communication Technology in dairy cooperative societies in Meru County, Kenya; and examine the contribution of ICT on productivity in dairy cooperative societies in Meru County, Kenya. The study reviewed previous studies with a view to establish academic gaps which the present study sought to bridge. This was done through library research.

This study adopted a descriptive survey design and employed quantitative research as the main approach to direct the study. The study focused on general managers and IT managers of all 20 listed MCDCU dairy cooperative societies in Meru County. The questionnaires were used as an instrument for data collection. Expert opinion was sought on validity of the instruments. Data analysis was started immediately after the field. Data was summarized into frequencies and

percentages and presented in tables and charts and figures. This section comprises of discussions based on the specific research objectives of the study.

The study findings outline that most of the general managers and IT managers of dairy farming cooperative societies in Meru County, Kenya are male aged between 30-40 years old and have attained postgraduate level of education. The study findings further reveal that majority of the respondents have worked in the organization for a period of over 4 years. Majority of the respondents (63.6%) indicated that the dairy farming cooperative societies in Meru County, Kenya have been in existence for more than 10 years and have more than 30 employees.

5.2.1 Analysis of the Factors Influencing Adoption of ICT in Dairy Cooperative Societies

5.2.1.1 Perceived Cost Factor

The study findings show that most of the respondents concur that cost of Information and Communication Technology adoption influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. Almost all of the respondents agreed to a very great extent that cost of Information and Communication Technology adoption influence adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya

The results also show that vast majority of respondents strongly agreed that the cost of ICT solutions and maintenance is high, and further agreed that the organization has a put aside a budget for ICT projects are statements regarding perceived cost influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. However, almost half of the respondents don't agree with the statement that ICT projects are easily funded in their organization as a statement regarding perceived cost influence on adoption of ICT solutions in

dairy cooperative societies in Meru County, Kenya. One unit change in perceived cost of adoption is associated with 60.7% change in adoption of ICT solutions in Meru Dairy cooperative societies.

These findings are in line with Ernst & Young (2012) who established that the cost related to adoption of ICT solutions is a factor that influences an organizations behavior of adoption. Seyal & Rahim (2006) found a significant relationship between cost and adoption of technology. Reducing the cost of ownership of ICT assets will result in higher rate of ICT adoption. Tan & Wu (2003), highlight that organizations spend huge sums of their budget annually on ICT systems and platforms though as competition grows so does the need to capitalize on the competitive advantage resulting from ICT adoption.

5.2.1.2 Perceived Usefulness Factor

The study findings show that most of the respondents concur that perceived usefulness influence adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya Majority of the respondents agreed to a very great extent that perceived usefulness influence adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya. The findings further exhibit that most of respondents strongly agreed that Information and Communication Technology systems have enhanced communication within the organization, ICT systems have improved communication with members, Information and Communication Technology solutions have improved business processes and work flow ICT solutions have had a positive impact on profitability and ICT solutions in my organization have improved productivity are statements regarding perceived

usefulness influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. One unit change in perceived usefulness is associated with 71.6 % change in adoption of ICT solutions in Meru Dairy cooperative societies.

The findings support Otieno (2015) who noted that perceived usefulness is also seen as the improvement in performance that an individual believes he can acquire when using a technology. The usefulness of the technology is related to the perception of the person who uses it in performing his or her work (Davis, 2013). Otieno (2015) posits that the acceptance of ICT is influenced by the perception of their potential users. The more they are convinced that their use is improving their performance, the more they adopt and incorporate them in their work.

5.2.1.3 Staff Competencies/Skills Factor

The study findings show that majority of the respondents concurred that staff competency/skill influence adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya. Majority of the respondents agreed to a very great extent that staff competency/skill influence adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya. The findings further exhibit that majority of interviewees strongly agreed with the statements that: employees in the organization are technology experts as a statement regarding staff competency/skill influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. A large number of the respondents agreed that: employees in the organization are trained on newly acquired Information and Communication Technology systems, employees in the organization easily adapt to new Information and Communication Technology solutions, and they have an adequate

technical team to administer Information and Communication Technology solutions as statements regarding staff competency/skill influence on adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya. One unit change in staff competency is associated with 52.7% change in adoption of Information and Communication Technology solutions in Meru Dairy cooperative societies.

The findings support Reynolds, Savage and Williams (2014) who in their research found that SME owners and top managers are less likely to adopt ICT if their employees are not familiar with the common ICTs used in the business environment. This occurs because of not being in the position to hire or train employees so that they may acquire the skills and knowledge needed to aid the company adopt and use ICT (Reynolds et al., 2014). Allison (1999) found that When companies have skilled and knowledgeable employees their ability to adopt and use ICT increases, thus leading to successful adoption of ICT in their organizations. Sanchez et al. (2007) revealed that, ICT training is a primary organizational factor because it helps users to understand how to best use and adopt ICT.

5.2.1.4 Top Management Support Factor

The study findings show that most of the respondents concurred that top management support influence adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya. Almost all the respondents agreed to a very great extent that top management support influence adoption of Information and Communication Technology solutions in dairy cooperative societies in Meru County, Kenya. The study findings further reveal that majority of the respondents agreed that management of the cooperative view

Information and Communication Technology as a strategic resource, Management of our cooperative allocates budget for Information and Communication Technology solutions, cooperative management supports Information and Communication Technology projects in the organization, and cooperative management encourages staff to be Information and Communication Technology proficient (as statements regarding top management support influence on adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. One unit change in top management support is associated with 69.3% change in adoption of ICT solutions in Meru Dairy cooperative societies.

The study findings are supported by Chuang et al. (2007) who noted that support given by top managers and management in regard to ICT adoption, is important for the successful adoption of ICT solutions, thus a highly skilled and knowledgeable management is more likely to adopt ICT solutions. A study done by Caldeira & Ward (2002), found that companies that had found success in adopting ICT systems and infrastructure, had top management who were willing to adopt new systems to improve work output, or had partnered with an IT firm that offered consulting services and managed their ICT infrastructure. Wojtkowski & Hardesty (2001) in their study revealed, that successful implementation of ICT initiatives within organizations, highly depend on their key managers being knowledgeable of new technological trends

A significant number of respondents indicated that ICT contributed to the operations of the dairy farming cooperative societies in Meru County, Kenya through: receiving updated information online, reduced job duplication, organized and less file storage, enhanced communication internally and externally, support for milk procurement, milk payment, helping in inventory and

records keeping, enhancing accounting systems, and ICT implementation has led in strategic planning roles.

A majority of the respondents cited cost of ICT technologies especially modern hardware and software is a leading challenge towards ICT adoption by dairy cooperatives in Meru County. Cost of implementation that includes staff trainings is also a challenge that hinders uptake and adoption of ICT. A significant number of respondents indicated that lack of understanding of the perceived usefulness on the benefits and contributions brought by ICT was also a leading challenge to dairy cooperative in Meru County. Majority of the respondents cited lack or poor top management support hinders ICT adoption as priorities in budget allocations are channeled elsewhere. A significant number of respondents indicated that slow penetration of ICT to other towns and rural areas is a challenge to ICT adoption and hinders development. Lack of knowledge, expertise, or organizational capacity needed in the dairy cooperatives was also cited as a challenge towards ICT adoption by dairy cooperatives in Meru County.

5.2.2 Contribution of ICT on Productivity of Dairy Cooperatives Societies

The study findings reveal that more than half of the respondents agreed dairy cooperative societies have adequately adopted ICT solutions. Majority of the respondents agreed ICT contribute to the productivity of dairy cooperative societies in Meru County, Kenya. The findings reveal that more than half of the respondents agreed to a very great extent that ICT contribute to the productivity of dairy cooperative societies in Meru County, Kenya. The areas in which ICT has contributed to productivity/performance of the cooperative society include: receiving updated information online, reduced job duplication, organized and less file storage,

enhanced communication internally and externally, support for milk procurement, milk payment, helping in inventory and records keeping, enhancing accounting systems, and ICT implementation has led in strategic planning roles. The findings are in line with Neelameghan (2005) and Kumar (2012) who stated similar benefits or contributions ICT brings to an organization.

The findings further reveal that majority of respondents strongly agreed that: ICT adoption has lessened time taken to carry out tasks ICT has helped in monitoring performance, ICT has encouraged exploration and support of innovation, ICT has enabled easy coordination within the company communication within and outside the company has improved due to ICT, ICT has made work more flexible, quality of work has improved due to ICT and ICT has helped reduce wastage in my organization are statements regarding benefits of ICT and productivity within the context of the organization. The Beta (β) coefficient for ICT contribution is 0.581. The β values imply that one unit change in ICT contribution is associated with 58.1% change in productivity of Meru Dairy cooperative societies.

The study findings reveal that the correlation coefficients imply that there exists a positive association between ICT contribution, cost of adoption of ICT, Perceived Usefulness, Staff Competency and Top Management Support to factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. This positive association suggests that when one increases, factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya increases.

The findings reveal that that the independent variables statistically predict the dependent variable $(5, 27) = 0.023, p < 0.05$ (i.e. the regression model is a good fit for the data and is significant). This therefore means that cost of adoption of ICT, perceived usefulness, staff competency, and top management support are statistically significant and they therefore influence the overall adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. Therefore, ICT contribution, cost of adoption of ICT, perceived usefulness, staff competency, and top management support have a statistically significant influence on the adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya.

5.3 Conclusions of the Study

The research aimed to analyze the factors affecting adoption of Information and Communication Technology solutions as well as examining the contribution of the same on productivity of dairy cooperative societies in Meru County, Kenya.

The study observed that cost of ICT adoption has a great influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The study also noted that the cost of ICT solutions and subsequent maintenance is high, and the organization has a set budget for ICT projects as perceived cost indicators of adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya. The study further found out that ICT projects are not easily funded in their organization.

The study found that perceived usefulness influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya to a very great extent. The study further revealed that ICT systems have improved communication within the organization, ICT systems have

improved communication with members, ICT solutions have improved business processes and work flow ICT solutions have had a positive impact on profitability and ICT solutions in my organization have improved productivity are perceived usefulness indicators that influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

The study found that staff competency/skill influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya to a very great extent. The study further found that employees in the organization are technology savvy, employees in the organization are trained on newly acquired ICT systems, employees in the organization easily adapt to new ICT solutions, and they have an adequate technical team to administer ICT solutions as staff competency/skill indicators that influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

The study found that top management support influences adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya to a very great extent. The study further found that that management of the cooperative view ICT as a strategic resource, management of our cooperative allocates budget for ICT solutions, cooperative management supports ICT projects in the organization, and cooperative management encourages staff to be ICT as top management support indicators that influence adoption of ICT solutions in dairy cooperative societies in Meru County, Kenya.

The study concludes that there exists a positive association between ICT contribution, cost of adoption of ICT, perceived usefulness, staff competency and top management support as factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya. This positive association suggests that when one factor increases, adoption of ICT

solutions in dairy farming cooperative societies in Meru County, Kenya increases. The study therefore concludes that ICT contribution, cost of adoption of ICT, perceived usefulness, staff competency, and top management support have a statistically significant influence on the adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya.

5.4 Recommendations of the Study

5.4.1 Suggestions for Improvements

Based on the above, findings, the following suggestions were made for the factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya.

The study recommends the need for enough financing to be availed to dairy cooperatives in Kenya to enable them to afford and adopt modern technologies. The government needs to ensure evenly distribution of robust ICT infrastructure across the country to all towns so as to reduce the cost of ICT adoption and access. There is also a necessity for adequate ICT awareness creation and training to dairy cooperative employees and their members who are farmers to enhance participation in the ICT implementation process.

There is need for the management of dairy cooperatives to communicate the usefulness of ICT adoption and ease of use to its staff and members. This will play a big role in enhancing performance improvement. Employees of the dairy cooperatives will embrace ICT in carrying out their tasks bringing out the benefits therein leading to boost in performance and productivity. Dairy farmers should be informed on the benefits of ICT in monitoring the progress of cooperatives, so they can embrace the need to enhance the implementation of ICT projects. They should be able to understand the efficiency ICT brings to them in regard to milk collection and payment process.

The study further recommends that management of dairy cooperatives need to recruit and train their employees in a bid to motivate them to embrace and use modern ICT technologies to benefit the most from the implemented ICT. There is need for dairy cooperatives in Kenya to invest in more ICT development opportunities and involve more employees to equip them with skills. The government should monitor experienced and qualified personnel offering ICT services in dairy cooperatives to ensure that they implement ICT in dairy cooperatives for good dairy farming business.

The study recommends the need for top management support in regard to ICT opportunity development. Support by management leads to proper financing for ICT technologies and approvals of staff trainings for ICT, as well as creating awareness of perceived usefulness of ICT to staff and members. Management will be able to use technologies to improve their performance and in the same time work on the cooperative's productivity. The perceived benefits of ICT will be able to come out clearly overtime.

5.4.2 Suggestions for Further Research

This study sought to analyze the factors affecting adoption of ICT solutions in dairy farming cooperative societies in Meru County, Kenya attempting to bridge the gap in knowledge that existed. Although the study attained these, it mainly focused on one County, which is Meru County. There is need to conduct a similar study in other counties and other cooperative societies in different sectors such as savings and credit, investments, marketing, other agricultural societies and attempt to compare the findings. There is also a need to conduct a study on the challenges facing adoption of ICT solutions in Kenya to establish whether performance of the cooperatives is affected.

