

**EFFECT OF TECHNOLOGY ADOPTION ON ORGANIZATIONAL  
PERFORMANCE OF DAIRY SOCIETIES IN UASIN GISHU COUNTY, KENYA**

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**A Research Project Submitted to the Graduate School in Partial Fulfillment of the  
Requirements for the Award of the Masters of Business Administration Degree of**

**Egerton University**

**EGERTON UNIVERSITY**

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## DECLARATION AND RECOMMENDATION

### **Declaration.**

This research proposal is my original work and has not been submitted for any degree or any award in any other university.

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### **Recommendation by the Supervisor.**

**This research has been submitted with my approval as the University Supervisor**

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## ABSTRACT

Dairy societies in Kenya, like many Africa countries is carried out by small-scale dairy farmers located in rural areas, often with low levels of literacy and very few technological skills. For dairy cooperatives to survive they have to streamline their operations and improve their management processes if they want to have a positive balance sheet and some surplus money to pay dividends to their members, therefore, the study assessed the effect of information communication and technology adoption on performance of dairy societies in Uasin Gishu County. The study specifically determined the effect of financial information system technologies adoption on organization performance of dairy societies, established the effect of Information communication technologies adoption on organization performance of dairy societies, ascertained the effect of human resource information system on organization performance of dairy societies and determined the effect of Product Processing technologies on organization performance of dairy societies. The study was informed by Diffusion of Innovation theory (DOI) and Theory of Constraints (TOC). The study adopted the explanatory research design which shows the causal effect of technology adoption and organization performance. A census of all the dairy cooperative societies in Uasin Gishu County was done, where there are a total of 20 dairy societies. The primary data for the study was obtained using questionnaires. Pretest on two dairy societies was done to test for reliability. The reliability of the questionnaire was tested using Cronbach Alpha coefficient. Quantitative data collected was analyzed using descriptive statistical techniques which are frequencies, means, and standard deviation. Inferential statistics such as Pearson moment correlations was used to establish the effects on the variables. Multiple regression was used to establish the cause effect of the variables. The findings of the study indicated that financial information system technologies adoption, information communication technology adoption and Product Processing technologies adoption had significant and positive effect on performance of dairy societies. The results showed that all the four predictors explained 65.7% of organizational performance. However, the study revealed that human resource information system had no significant effect on performance of dairy societies. The study concludes that financial information system technologies adoption, information communication technology adoption and Product Processing technologies adoption are significantly related to organizational performance of dairy societies. The study recommends that policies on financial information system technologies, Human Resources information system, ICT and product processing technologies should be adopted to boost organizational performance and enable them to have a competitive edge.

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## **ABBREVIATIONS AND ACRONYMS**

FAO	Food and Agriculture Organization
GIS	Geographic Information System
HACCP	Hazard analysis And Critical Control Points
HRIS	Human Resource Management System
ICT	Information and communications technology
IDF	International Diabetes Federation
IFRS	International Financial system Reporting Standards
IT	Information technology
OECD	Organization for Economic Co-operation and Development
PDA	Personal Digital Assistant
SACCO	Savings and Credit Corporative Society
VoIP	Voice over Internet Protocol

## **CHAPTER ONE**

### **1.1 Background to the Study**

Dairy farmer co-operative societies have played an important role in the adoption of market-oriented dairying by smallholder farmers (Hopcraft & Ruigu, 2006). This indicates that dairy cooperative also play a pivotal role in social and economic empowerment of their members as compared to non-members. However, Rathod et al., (2012 b) and Biradar (2009) pointed out the constraints related to financial, human resources, policies and administrative aspects hamper the organization performance of dairy cooperatives.

In Europe, the need to effectively coordinate the activities of individual, organizational sub units is vastly greater in 2015 than even a few years ago. It is driven by an increasingly competitive world. According to Studies in United States of America and United Kingdom, technology is likely to increase the efficiency, outreach and sustainability of cooperative societies.

The technology adoption decision within organizations in Malaysian and Turkey is usually authorized by a group of senior managers (Peansupap & Walker, 2005), therefore a key question of information technology adoption in construction firms should be how to ensure that users accept and utilize information technology in their work processes. However, studies in China indicate that the rate of unsuccessful information technology implementation is growing and further, the adoption rate is very slow (Acar et al., 2005; Mole et al., 2004; Shin, 2006). According to Gambatese and Hallowell's (2011) it is important to identify the characteristics of technology-customer linkage (Dabholkar & Bagozzi 2002; Meuter et al., 2000), whereas the technology-employee interface is primarily aimed at internal operations, as opposed to frontline support technologies in boundary-spanning processes (Parasuraman & Grewal, 2000).

In this endeavor, information and communication technology plays an increasingly important role in facilitating the introduction of new products or services, in improving operational processes, and in guiding managerial decision making. The impact of globalization has compelled dairy societies to adopt ICT, to enable dairy societies to survive and compete with large companies. Dairy societies would greatly benefit by ICT adoption in their business processes (Maguire et al., 2007). However, as dairy societies continue contributing to the economy, they are faced with many challenges which inhibit them not to compete with large enterprises. One of the major constraints is lack of ICT adoption in their business processes. It is commonly accepted that ICTs provide many potential benefits to organizations so as to make them more efficient, effective and competitive (Fink & Disterer, 2006).

ICT has changed the way finance officers work. Technological advances in hardware and software have taken users of accounting information systems from the mainframe environment to mini and desktop computers and have become critical and integrated part of modern financial management system (Mensah & Marfo, 2009). With the technological system of every organization being a reflection of its structure and needs, ICT-enabled financial management system is sometimes said to be a model of that organization (Winchara, 2010).

A steady increase of dairy cattle population in Africa and India therefore has not been reflected in the economic growth in the dairy industry as production per cow continued to decline to about 500 kilograms of Milk per cow per annum.(FAO, 2010).In Kenya the Dairy industry accounted for 4.1% of Gross Domestic Product with Small holder dairy production accounting for over 70% of the total milk production and has always received a lot of attention from the government since independence (National Livestock Policy, 2008)

Dairy production in Kenya, as in many developing countries, is carried out by small-scale dairy farmers located in rural areas, often with very few technology skills. For most Kenyan dairy farmers, their only source of income comes from selling milk. But over the years, many small-scale producers have pooled their resources and built up strong

cooperative societies that collect the milk and then sell it on to bulk processors. Some cooperatives belong to an even bigger union that also processes milk from its members before selling the final product in retail markets. Empirical studies on the effect of technologies adoptions and organization performance were scanty.

The adoption of information technology across many service industries is rapidly changing the nature of the service delivery process, necessitating employees and encouraging customers to interact with technology (Parasuraman, 2000). It has been argued that the use of IT enhances the performance of service employees, both in terms of efficiency and effectiveness, by enabling customization and flexibility in their encounters with customers (Bitner et al., 2000).

Organizational performance is a measure of how well an organization achieves appropriate objectives or how efficient and effective an organization is (Stoner, J. 2002).The expected outcomes of organizational performance are quality of service delivery, increase in members, accurate reports, product competitiveness, good customer relations and increase in volume of milk. Measuring performance has been part and parcel of any successful business entity.it is strategic because the long run survival of any organization depends on its performance.

## **1.2 Statement of the Problem**

Dairy societies in Kenya as in many African countries are carried out by small-scale dairy farmers located in rural areas, often with low levels of literacy and very few technology skills (Staal et al., 2002). Most of the dairy farmers are young and are faced with new technological challenges. From a practice perspective dairy societies are noticing the importance of adopting technology if they want to remain competitive. For dairy cooperatives to survive they have to streamline their operations and improve their management processes if they want to have a positive balance sheet and some surplus money to pay dividends to their members. Despite the increase in use of computers, dairy societies are still not performing well which has accelerated their collapse (Atieno & Kanyinga, 2013). The dairy societies have faced various challenges especially after

liberalization in Kenya and the world. Most of the cooperative societies in Uasin Gishu County are not performing well compared to other dairy societies in similar regions in the country (Kibiego., 2015).Members have had their payments delayed in addition to other inefficiencies which has led the researcher to postulate that the failure of technology adoption cold be a major factor. Technologies have been found to promote the dual objective of sustainability and outreach of organizations (Ssewanyana, 2009). However, these studies did not show the effect of technology adoption and organizational performance of dairy societies. Therefore, the study seeks to address the effect of technology adoptions on organizational performance of dairy societies in Uasin Gishu County.

### **1.3 General objective**

To assess the effect of technology adoption on organization performance of dairy societies in Uasin Gishu County.

#### **1.3.1 Specific Objectives**

This research was guided by the following specific objectives:

- i. To determine effect of Financial information system technologies adoption on organization performance of dairy societies
- ii. To establish effect of communication technologies adoption on organization performance of dairy societies
- iii. To ascertain the effect of human resource information system adoption on organization performance of dairy societies
- iv. To determine the effect of Product Processing technologies adoption on organization performance of dairy societies
- v. Establish the combined effect of Financial information system technologies adoption, Information and communication technologies adoption, human resource information system adoption and Product Processing technologies adoption on organizational performance of dairy societies

## **1.4 Research Hypotheses**

This research was guided by the following hypotheses:

- H<sub>O1</sub>: Financial information system technologies adoption has no significant effect on organization performance of dairy societies
- H<sub>O2</sub>: Information Communication technologies adoption has no significant effect on organization performance of dairy societies
- H<sub>O3</sub>: Human Resource information system adoption has no significant effect on organization performance of dairy societies
- H<sub>O4</sub>: Product processing technology adoption has no significant effect on organization performance of dairy societies
- H<sub>O5</sub>: There is no significant effect of combined components of financial information systems technologies adoption, communication technologies adoption, human resource information system adoption and Product Processing technologies adoption on organizational performance of dairy societies

## **1.5 Significance of the Study**

The study came up with interventions that need to be put in place by dairy societies' managers to improve their performance as regards to applications of technologies

The study is beneficial to Policy makers and practitioners as they will know what policy to initiate or review to conform to the needs of technology adoption on organizational performance.

This study is of help to staff working in the dairy societies to understand how to optimize the utilization of technology as a tool to improve performance and gain competitive advantage.



Finally, the study is important to future researchers and academicians who will add the findings of this research to their body of work.

## **1.6 Scope of the Study**

This study was only conducted in Uasin Gishu County and it involved 180 respondents drawn from 20 dairy Societies, It only covered the effect of technology adoption on organization performance of dairy societies in Uasin Gishu County. The study focused only on establishing the effects of technology adoption which include financial information system technologies adoption, Information communication technologies adoption, human resources information system and Product Processing technologies on organizational performance.

## **1.7 Limitation of the Study**

The first major challenge encountered during the study was the reluctance of the respondents to give information about their dairy societies due confidentiality issues such as the fear of exposing their strategies to competitors. The research focused specifically on the effects of technology adoption on organizational performance in Uasin Gishu County, Therefore, generalizations of the results to other dairy societies outside the County must be done with caution. The study was limited to only four technologies affecting organizational performance of dairy societies.

## **1.8 Operational Definition of terms**

**Financial information system technologies:** Is the methodology and software that dairy societies use to oversee and govern its income, expenses and assets with the objectives of maximizing profits and ensuring performance.

**Information Communication Technologies:** Is an umbrella term that includes any communication device or application, encompassing radio, television, cellular phones, computer and network, hardware and software and satellite systems, as well as the

various services and applications associated with them, such as videoconferencing and distance learning adopted by the dairy societies

**Human Resource Information System:** Is a software or online solution for the data entry, data tracking, and data information needs of the Human Resources, payroll, management, and accounting functions within a dairy society.

**Product processing technologies:** Are the machines, equipment and devices that contribute to day to day operations of the dairy society for transforming raw materials into finished goods for value addition.

**Technology:** Is the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems, and methods of organization, in order to solve a problem, improve a pre-existing solution to a problem, achieve a goal, handle an applied input/output relation or perform a specific function. It can also refer to the collection of such tools, including machinery, modifications, arrangements and procedures.

**Organizational performance:** Comprises the actual output or results of the dairy society as measured against its intended outputs, it also relates to how successfully dairy societies perform their functions

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Theoretical Review

The study reviewed various theories which include Diffusion of Innovation theory and Theory of Constraints

##### 2.1.1 Diffusion of Innovation theory (DOI)

Diffusion of innovations is a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. Diffusion is the process by which an innovation is communicated through certain channels over time among the participants in a social system (Rogers, 1995). Individuals are seen as possessing different degrees of willingness to adopt innovations, and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time (Rogers, 1995).

Breaking this normal distribution into segments leads to the segregation of individuals into the following five categories of individual innovativeness (from earliest to latest adopters): innovators, early adopters, early majority, late majority, laggards (Rogers, 1995). The innovation process in organizations is much more complex. It generally involves a number of individuals, perhaps including both supporters and opponents of the new idea, each of whom plays a role in the innovation-decision.

Based on DOI theory at firm level (Rogers,1995), innovativeness is related to such independent variables in this study as Financial information system technologies adoption, communication technologies, human resources information system and Product Processing technologies adoption. These are linked to organization performance using Diffusion of innovation (DOI) theory, which Rogers linked initial adoption decision to five specific management attributes: relative advantage, complexity,

compatibility, trialability and observability (Rogers, 2003). Moore and Benbasat (1991) identified eight Perceived characteristic of innovation (PCI) factors: relative advantage, compatibility, ease of use, result demonstrability, image, visibility, trialability and voluntariness. For example, HRIS assists the HR department in making the HRM process easier, faster, cheaper, and more effectively; it also benefits the organization to greater success. All these benefits of HRIS can be achieved perfectly only if the system is adopted or adapted in an organization accurately and more effectively.

### **2.1.2 Theory of Constraints (TOC)**

The theory of constraints (TOC) is a systems management philosophy developed by Eliyahu M. Goldratt in the early 1980s. The fundamental thesis of TOC is that constraints establish the limits of performance for any system. Most organizations contain only a few core constraints. TOC suggest that managers should focus on effectively managing the capacity and capability of these constraints if they are to improve the performance of their organization. (Goldratt E M, 2004)

TOC challenges managers to rethink some of their fundamental assumptions about how to achieve the goals of their organizations, about what they consider productive actions, and about the real purpose of cost management.

The theory of constraints (TOC) has recently gained much success in its application to industrial and service organizations. Theory of Constraints (TOC) in a services environment, specifically for the dairy societies, analyses the factors involved in the decision to adopt the TOC by organizations in this sector. It will be identified that the four elements of the TOC theory i.e. throughput, inventory, operating expenses and constraints, correspond respectively to the funds coming from the sales, funds required to generate this profit, funds to fund the expenses, and the limitations to the normal activity. Regarding the constraints, the most common are mainly administrative (regulations and policies) and the lack of technological resources associated to the scarcity of capital flow and the environment imposed by the state of the economy at specific time. This study will apply the TOC principles to the management of information technology (IT) in the

organization. Management practices in industry as a whole are undergoing profound changes as the methodologies of total quality management (TQM), just in-time (JIT), and the theory of constraints (TOC) are being absorbed (Goldratt E M, 2004).

## **2.2 Organizational performance Measurement**

Performance is the measure of how well an organization achieves appropriate objectives or how efficient an organization is (Stoner J. 2002). Performance is set up so that the deviance between the actual and intended outcome is identified. After that the necessary analysis is instituted to determine the source of the deviance and possible courses of action to remedy it.

Measuring performance has been a central issue in marketing and remains a vital concern for a large majority of organizations. (Morgan, T.G. 2004) Managers and academicians have both been drawn to the topic with an urgency and scope previously unprecedented (Clark 1999).

(Clark 1999) attributed this interest in measuring performance to the convergence of four trends: Firstly, after a decade of “downsizing” major corporations were reaching the point of diminishing returns which had led to a refocusing on marketing, as a driver of future profit and growth (Sheth .J. 1995) .Secondly, there has been increasing demand for information related to marketing, which traditionally has been poorly reported in firm financial statements. Thirdly, measures of organizational performance such as balanced scorecard (Kaplan, R.S 1992) have attracted attention to the issue of which marketing measures should be included in the overall assessment of organizational performance. Finally, marketing managers have become frustrated with traditional performance measures that they believe undervalue what they do.

Businesses are tending to rely on financial measures(which are based on Accounting Standards) such as, profit, return on investment, and return on assets, alone to assess overall corporate performance(Wheelen H. 2002). Measures that focus solely on financial performance are seen as less appropriate to deal with the issues which confront organizations now(Ahn,2001).”Sole reliance on financial measures of performance does not arguably reflect the importance of current resource decisions for future financial

performance. Though some firms recognized the importance of non-financial performance measures many years ago (e.g., General Electric in the 1950s),

In this error of intense competition, dairy societies have become more and more concerned with the number of members, quality of service delivery and the volume of milk supplied. To the extent that these are used as dairy society performance indices, it is desirable for individuals concerned to have thorough knowledge of the processes which generate increase in volume of milk and membership increase

### **2.3 Concept of technology adoption**

Smith (2010) argues that technology adoption describes the adoption or acceptance of a new product or innovation, according to the demographic and psychological characteristics of defined adopter groups. The process of adoption over time is typically illustrated as a classical normal distribution or bell curve. The model indicates that the first group of people to use a new product is called innovators, followed by early adopters. Next come the early and late majority, and the last group to eventually adopt a product are called laggards.

Wenger (2010) argues that the contribution of new technology to economic growth can only be realized when and if the new technology is widely diffused and used. Diffusion itself results from a series of individual decisions to begin using the new technology, decisions which are often the result of a comparison of the uncertain benefits of the new invention with the uncertain costs of adopting it.

In recent years, rapid technological progress, especially in information and computer technologies, has heightened the importance of new technologies in a competitive marketplace. In today's technology-driven economy, new innovations develop rapidly, and managers constantly face adoption decisions. Companies often invest in new technologies in the hope to gain an edge over their competitors. A survey shows that 50% of technology executives indicated that to gain competitive advantage was the top priority that influenced their organization's increase in Internet-based technology investment, and 21% believed that responding to a competitor was also a key factor (Sachs, 2000).

In an oligopolistic industry, one firm's technology adoption decision could affect the market structure and equilibrium. While the tangible value e.g., improvement in productivity and operational efficiency of new technologies has been the focus of the literature, a few recent studies show that a major driver of investment in technology lies in the value gained from altering the competitive equilibrium (Mendelson, 1998; Zhu, 1999)

New technologies refer to any technologies that are critical to the firm's ability to compete in the product market. Our model will abstract away from specific technologies, though information technologies seem to exhibit these features more often than traditional technologies. Their deployment often helps the company to reduce cost or serve new markets (Kathuria et al., 1999). For example, auto manufacturers, such as Ford and General Motors (GM), invested heavily in electronic data interchange (EDI) and, more recently, in business-to-business (B2B) e-procurement systems to reduce costs and, hence, gain a competitive edge over their rivals in the auto market. Similarly, Dell and Gateway are leveraging their investments in Internet-based supply chain systems to gain advantages over competitors. In addition to these examples, successful applications of new technology in achieving competitive gains are abundantly documented in the literature; including American Airline's SABRE computer reservation system, Wal-Mart's inventory information system, and FedEx's package tracking system. A common benefit of these adoptions is the capability to compete in product markets at lower cost or with better efficiency. In some situations, without the new technology, the firms would not be able to compete in the market (Verdier, 2009).

These examples also illustrate that technology adoption decisions are often made under considerations or competitive pressure. Indeed, in an oligopolistic industry with several competitors, adopting a new technology is a decision. On the one hand, facing uncertainty about the new technology, each firm has an incentive to delay the adoption decision until it receives more information to resolve uncertainties about the new technology's cost and performance. On the other hand, if it does so, it runs the risk that another firm may preempt it by adopting first because technological investments often exhibit early mover advantages due to standard-setting, economies of scale, brand

recognition, and other factors (Rayna, 2009). Fear of preemption by a rival creates incentives to act quickly. This dilemma is especially important when the market is volatile and the future performance of the new technology is uncertain. Thus, the tradeoff between adopting early and waiting for more information elevates the importance of leader-follower dynamics.

Technological advances in the dairy industry have contributed greatly toward the financial success of farmers through increased productivity and lower per unit costs. Average milk production per cow in the United States has increased from 12,505 lb in 1984 to 17,192 lb in 1998 (U.S. Department of Agriculture, 1996 and 1999). Because technological advances work at extending the size over which costs remain low due to gains in productivity, farms are becoming larger and less in number. Matulich attributes the consolidation of dairy farms and herd expansion to the economic incentives that were provided by advances in milking systems, feed, and herd management.

According to Samuel (2009) over the 1984–1998 period, the number of dairy farms in the United States declined by about 59% (from 282,430 to 116,430), and the average size of operation when measured in milk cows increased from 38 to 79 (Manchester and Blayney; U.S. Department of Agriculture, 1999). Increases in productivity resulting from technological advances have not been unique to the dairy sector, since sustained productivity increases in other sectors of U.S. agriculture have been attributed to the acceleration of technical change as contributing factors toward the rise in productivity in dairy production include, among others, use of technologies that fall within two broad categories: capital-intensive e.g., advanced milking parlors, genetically superior milking cows and management-intensive e.g., use of record-keeping systems for total management, bovine somatotropin, improved nutrition and feeding practices.

Louis (2009) argues that because of their high startup costs, capital-intensive technologies can only be afforded by larger and more specialized operations and, as such, may act at restricting open entry into dairy farming. In contrast, management-intensive technologies are inexpensive, but their success requires higher levels of human capital by farmers. Efficient dairy farmers have a better chance at staying competitive and



financially solvent as milk prices become increasingly volatile, a direct result of the market-oriented dairy policy prescribed by the 1996 farm bill. The main objective of this study is to examine the determinants of production performance of a sample of dairy farms using multinomial regression procedures and data from the 1993 Agricultural Resource Management Study (formerly known as Farm Costs and Returns Survey).

Data on individual workers in the US shows that computer use in the workplace rose from 27 percent in 1984 to 60 percent in 2001. According to one study, Canadian enterprises identified increased efficiency and reduced cost as the two most important drivers behind the adoption of ICT. These perceptions are consistent with the international average. Canadian firms generally trail their U.S. counterparts in the adoption of advanced technology. This result occurs in part because Canada has a higher proportion of small and medium enterprises than the United States. Smaller firms tend to be slower adopters. Large Canadian firms do not tend to lag much behind their U.S. counterparts. Canadian firms compare well with their international counterparts outside of the United States. Within Canada, regional differences in technology use are relatively minor, but variations across industries are considerable. Evidence suggests that advanced technology use will be more prevalent in industries relying on science-based research. Differences in plant size, financial capabilities, and the applicability of certain technologies all additionally contribute to differences in advanced technology use across industries (OECD, 2003).

On average, technology is advancing more rapidly among low-income countries in Asia like India. Among those low-income countries for which sufficient data are available, the penetration of technology is progressing more rapidly than in either middle- or high-income countries. However, this reflects very strong catch-up in some countries and more modest improvements, or even relative declines, in the majority. Moreover, technology in high-income countries is also advancing, and the absolute increase in these countries is larger than in developing countries (Mitra, 2001).

Staal et al., (2002) used GIS data to examine smallholder dairy farms in Kenya. Holloway, G. (2002) used spatial econometric models to understand the adoption of high-

yielding rice varieties in the Philippines. Batz et al., (2002) developed an approach to predict the speed and ceiling of technology adoption, using relative investment, relative risk and relative complexity for smallholder dairying in Kenya. Related to these are new methods that simulate the adoption and diffusion of technologies (Berger, 2001; Dimara and Skuras, 2003; Mahmoud, 2004). These new methodological approaches are important developments for our understanding of technology adoption issues.

Conley and Udry (2003) modeled the adoption of pineapple production practices in Ghana and found that social learning is important in the spread of the new technologies. Foster and Rosezweig found that own experience and neighbor's experiences with high yielding varieties in India significantly increased the profitability from these varieties. Considerable more work is needed in this area to understand how the use of technologies spread.

#### **2.4 Management of Dairy Societies**

Dairy societies' management is about managing farms. Dairy society's management is defined as the process by which resources and situations are manipulated by the farm family in trying, with less than full information, to achieve its goals. Demeke (2003) considered two major tasks facing today's farmers in pursuing their goals: how best to incorporate new technology into the farming enterprises and how to be sufficiently flexible, mentally and financially, to adjust the management of their resources to meet the challenges of varying costs, prices and climatic conditions.

To achieve this second task, dairy farmers must then become business managers. In other words, they must successfully manage the business of their farming enterprises, so dairy society's management is just one of a number of disciplines, each of which have important effect on the success or otherwise of their farming operations. The other key disciplines are covered in the practical sciences such as cropping, livestock production, farm engineering and resource management. The skills of Dairy society's management are very diverse and many cannot be learnt from a book such as this, but only from being a farmer (Zeller, 2001).

This is called experiential learning, or learning from experience, because only through making such decisions and living with the consequences do many farmers learn the difference between right and wrong choices, between good and poor decisions, and of most importance, the differences between profitable, less profitable and unprofitable farming practices. Any form of management requires decision making. This process has six generally recognized steps: having ideas and recognizing problems, making observations, analyzing observations and testing alternative solutions to the problem, choosing the best course of action, acting on this decision and taking responsibility for the decision (Emmi, 2013).

Ferris and Malcolm (1999) expressed this concept in a slightly different way when they considered that managing a dairy farm business is a continual process of planning to do something and then changing intentions as time passes and new circumstances, different to those which were previously anticipated, dictate that different actions be taken. Managing a farm business is about manipulating resources in situations where much is unknown, to try to achieve and establish situations in a future which is knowable. It is about deciding how the resources under control are best used to achieve objectives sometime in the future, when the only certainty is that 'the future will be a different world, where they do things differently'.

According to Dimara (2003) dairy farming is a business and as with any business, only by providing the production units namely the milking cows with the most appropriate inputs that is, the correct housing, feeding and herd management, will the business be profitable. In other words, the business of dairy farming starts off with an understanding of the theory and practice of dairy production technology.

## **2.5 Empirical Review**

The study empirically reviewed the effect of financial information system Technologies, Communication Technologies, Human Resources Information System and Product Processing Technologies Adoption on organization performance.

### **2.5.1 Effect of Financial information system Technologies Adoption on organization performance of Dairy Societies**

Ott and Rendleman (2000) used multiple regression on dairy societies in a study conducted in the United States dairy firms on Financial information system technologies, they argued out that dairy societies are significant users of Financial information system technologies that employ economic and statistical models to create and value new securities, estimate return distributions, and make portfolio decisions based on financial data thus performance of the societies. Examples include financial engineering used to create new financial derivatives, credit risk and market risk models employed to improve portfolio management, and modern credit scoring and discriminant analysis used to evaluate credit applications. These Financial information system technologies often depend heavily on the use of IT to collect, process, and disseminate the data, as well as on economic and statistical models to evaluate the data thus improving management of the societies. Technological progress in the dairy industry is also important because of the key roles of banks in providing financing, deposit, and payments services to other sectors of the economy.

Gloy and Akridge (2000) studied the use of technology in Wisconsin and Kansas to determine which factors influenced financial information system technologies usage by farmers and asserted that there has been a push towards the adoption of financial information system technologies thus more performance of dairy societies. The increasing growth in international trade, cross border financial transactions and investments which unavoidably involve the preparation and presentation of accounting reports that is useful across various national borders, has brought about the adoption of Financial information system technologies by both the developed and developing countries (Armstrong et al., 2007).

According to Barth (2007), the adoption of Financial information system technologies is expected to have the benefits like lower the cost of financial information processing and auditing to capital market participants as users, familiarity with one common set of international accounting standards instead of various local accounting standards by

Accountants and Auditors of financial reports, comparability and uniformity of financial statements among companies and countries making the work of investment analysts easy, attraction of foreign investors in addition to general capital market liberalization thus performance.

Ball (2006) stated that many developing countries like Kenya where the quality of local governance institutions is low, the decision to adopt financial information system technologies would be beneficial in ensuring performance. Lipsey and Chrystal (2003) noted that adoption of Financial information system technologies often generates somewhat higher-paying jobs than might otherwise be available to local citizens, it generates investment that may not be possible with the local resources only, it links the recipient economy into the world economy in manners that would be hard to achieve by new firms of a purely local origin.

According to Lipsey and Chrystal (2003) the adoption of Financial information system technologies alters country's comparative advantages and improves its competitiveness through technology transfer, domestic investment which can alter a country's volume and pattern of trade in many income enhancing directions. Countries that suffer from corruption, slow-moving, or ineffective government are likely to resist the change (La Porta et al., 1999) but in such countries, the opportunity and switching costs are lower which makes the possibility of adopting IFRS advantageous.

Financial information system technological projects have been criticized because they face well-known problems concerning crime, problems of adjustment to the social context, and possibly infrastructural problems. While a link between poverty reduction and ICT exists, the connection is yet to be fully understood.

Expenditure on Financial information system technologies has been known to cause intra-household conflict, foster male dominance over resources and divert household resources away from food and other essentials. Human right concerns such as child labor have also been raised over the use of conflict materials in the production of Financial information system technology devices (Daniel, 2011).

### **2.5.2 Effect of Communication Technologies Adoption on organization Performance of Dairy Societies**

Trant (2002) in a qualitative study done in the UK using regression analysis argues that adoption of Information and Communication Technology (ICT) comprises computing and allied equipment and communications infrastructure which together facilitate the gathering and processing of data, subsequent storing, distributing and communicating information. In other words ICT is a collection of hardware and software used in the collection, storage, processing, dissemination and use of information (Agboola, 2009). Indeed, Information and Communications Technology (ICT) has become a catchword with different interpretations and viewpoints even among experts (Osterwalder, 2003). The rapid advances in technology drastically changed the traditional ways in which information was processed, communications conducted, and services made available (Sarfo, 2007). With respect to financial management, ICT combines accounting principles and concepts with the benefits of an information system which is used to analyze and record business transactions, prepare financial statements and provide accounting data for the intended users (Sloan, 2001).

The adoption of ICT technology influences significantly the business by changing the industry infrastructure and business operations and by creating the premises for the emergence of competitive advantages for those organizations that are adopting ICT in their business processes hence performance (Sloan, 2001).

De Vinals (2001) argues that ICT-solutions help dairy societies to increase their productivity and achieve higher business performance through performance. However, the percentage of ICT adoption by dairy societies in the BRICS countries is very low. Thus, nowadays a very moderate usage of ICT by dairy societies in the emerging economies can be observed. This can be explained due to the fact that in the developing countries the dairy societies are faced with additional challenges - high cost of telecommunications, lack of legislative support from the state, use of obsolete technologies, overall technological illiteracy, lack of qualified staff and poor communication infrastructure.

There is considerable evidence that ICT adoption in the dairy sector has a positive impact on performance. One line of research has demonstrated using microeconomic production theory that ICT investment had a large impact on company behavior and productivity in the late 1990s. For example, Oliner and Sichel (2000), Jorgenson and Stiroh (2000), and Baily and Lawrence (2001) credit ICT with the rapid growth of the U.S. economy in the late 1990s. Stiroh (2002) argues that this productivity acceleration was broad based and finds an increase in productivity related to ICT use in nearly two-thirds of dairy industries from 1995 to 2000. Baily and Lawrence (2001) claim about the 1990s, In particular, there has been a substantial structural acceleration of total factor productivity outside the computer sector. And there is clear supportive evidence of an acceleration of productivity in dairy industries that are purchasing ICT.

In another study of ICT and productivity growth in the 1990s in the US, Brynjolfsson and Hitt (2003) use firm-level data to find that substantial long-term productivity gains and performance result from adoption of ICT use. Although these studies focus on the role of generic information technology investment, recent work has demonstrated a link between computer networking and acceleration in establishment-level productivity (Atrostic and Nguyen, 2002; Stiroh, 2002).

Recent research has argued that the effect of IT adoption and performance of dairy societies will depend on usage. Using data on dairy societies Devaraj and Kohli (2003) in a Zimbabwe study argue that ICT use is a much better predictor of performance than is ICT adoption at the firm level. Many dairy firms adopt a technology on the surface, but, unless it is frequently and properly used, it will not have a positive impact and may even have a negative one.

Questions have been raised about whether ICT projects that have been implemented in the dairy sector at enormous cost are actually designed to be scalable, or whether these projects make enough of an impact to produce noticeable change. For example, in Sri Lanka, journalist Nalaka Gunawardene argued that thousands of pilot projects had been seeded without regard to generalizability, scalability, and sustainability, implying that these projects will always require external funding to continue running and that their

impact is limited. This sentiment echoes 2003 report by the World Bank (World Bank, 2003)

### **2.5.3 Effect of Human Resources Information System on organization performance of Dairy Societies**

The use of Human Resource Information Systems (HRIS) has been advocated as an opportunity for human resource (HR) professionals to become partners with top management and to improve their management skills (Lengnick-Hall and Moritz, 2003). The idea has been that HRIS would allow for the HR function to become more efficient and to provide better information for decision making. The question remains whether HRIS has fulfilled its promise.

Walker (2001) conducted a study on dairy societies in the UK and found that the HRIS is a system used to acquire, store, manipulate, analyze, retrieve and distribute pertinent information about an organization's human resources thus ensuring performance. It is often regarded as a service provided to a dairy society organization in the form of information. However, the promise is that, as the use of these systems become more widespread, higher level forms of HRIS will evolve.

Lengnick-Hall and Moritz (2003) have postulated that HRIS will be implemented at three different levels: the publishing of information; the automation of transactions; and, finally, a change in the way human resource management is conducted in the organization by transforming HR into a partner with the line business thus performance. In their view, the adoption of HR as promoted by HRIS evolves from information to automation and from automation to transformation. They note that while HRIS has been widely deployed, a transformation of human resource management has occurred in relatively few organizations. The evolution that Lengnick-Hall and Moritz propose, along with others (Walker, 2001), revolves around the perspective that HRIS will create informational efficiencies and cost savings such that HR departments can turn their attention to providing better analysis of current data and creative uses of the HRIS to provide better and more accurate data upon which to base decisions.



Dairy societies become more complex as the amount of information they need increases the need for automated information systems. The organization determines what kind of information it will need by deciding what kind of decision it will be making based on the HRIS information and which will be the decision maker. Because these needs are likely to change over time, it is also necessary to build a certain amount of flexibility. However, human resources information systems ( HRIS) is more than a simple aggregation mechanism for inventory control and accounting ; it is the foundation for a set of management tools enabling managers to establish objectives for the use of their organization's human resources and to measure the extent to which those objectives have been achieved.

Therefore the most significant factor for selecting this system is to add some innovative features to the website due to the fact web based technology has been the paramount determining factor for the immense use of technology in business world, since it has allowed sharing of data in distributed computer systems and also on PDA and web enable phones. Bussler et-al pointed out that, there is not a function in HR today that is not applying software, thus the need for each organization to give precedence to information system that will enhance data maintenance and database optimization (Bussler & Davis, 2002). These will help the human resource and management to optimally utilize all information in their database through querying, analyzing and monitoring hence a competitive advantage to them. Many companies have seen a need to transform the way Human Resource operations are performed in order to keep up with new technology and escalating numbers of employees according to Brown, so that the organization can be able to optimize the potential employee and have competitive advantage over other organizations (Brown & Steven, 2008).

A significant problem with deciding whether HRIS benefits the organization is that of measuring the effect of HR and more particularly HRIS on the bottom line. There are few clear cut ways to measure the value of HRIS. While there are measurements for administrative HRIS such as cost reductions in HR departments, it is difficult to measure precisely the return on investment and specific improvements in productivity within the HR, there is an effect of human resource information systems (HRIS) and human

resources. To gain vital information to be able to compete in a competitive environment, the study seeks to have an in depth analysis of the issue at hand. These and other related issues provided the foundation for this research to be carried out in order to investigate the role of HRIS in human resource management. The main objective of the study is to identify specifically, how the use of Human Resource Information Systems (HRIS) contributes to the effectiveness of human resources management and to examine the importance of using HRIS at the workplace (Vienna, 2001).

In a case study done in Kenya of Limuru Dairy Farmers Cooperative Society it was argued that the human resource strategy has a significant role in supporting the implementation of the strategy of an organization and performance of dairy societies. In this direction, a lot of the literature covering the effect of human resource management and firm performance is based on the universalistic or best practices perspective that implies a direct effect of particular approaches to human resources and performance. Many researchers have empirically supported universalistic predictions especially in context where HRIS is concerned. First there are those who focus on a single or several HRM practices and examine their effect on various performance measures. There are also similar studies examining the effect of bundles, or systems, of HRM practices on performance. This stream of research implies that firms should create a high degree of internal consistency among their HR activities (Walker, 2001).

#### **2.5.4 Effect of Product Processing Technologies on organization performance of Dairy Societies**

In a study conducted by Lacobbo (2006) in the US it was argued that food producers are responsible for the safety of their products, and to guarantee food safety of dairy products, the dairy industry has implemented Product Processing technologies of critical control points (HACCP) systems that contribute to performance thus greater profits. This enables quality assurance of final products via a chain management approach (European Commission, 2004). The quality and safety of raw milk is essential for the quality and safety of milk and dairy products. The quality and safety of milk is related to the

contamination of milk with microorganisms, chemical residues and other contaminants (Jayarao & Henning, 2001).

In addition to their significance for public health, Product Processing technologies create a very good microbial quality of raw milk that is also important to prevent production losses and to achieve an optimal shelf life of dairy products. For example, spore formers of butyric acid bacteria in raw milk are responsible for defects in semi-hard cheeses, and the contamination of raw milk with spores of *Bacillus cereus* limits the shelf life of pasteurized dairy products. To ensure a good microbial quality of bulk tank milk, quality assurance systems for dairy farms are being developed and bacteriological schemes are being implemented in payment systems of farm raw bulk milk thus a proof of performance in the dairy societies (IDF, 2006).

In addition, the technology of hygienic milk production by dairy farmers is important with respect to animal welfare and the image of the dairy sector. Pathogenic microorganisms can infect cow's e.g. gastrointestinal tract, udder tissue, and result in reduced milk yields and even the death of animals. Thus, in summary, control of the microbial ecology at the dairy farm resulting in on-farm hygienic milk production is important for all elements of the dairy production chain. In this chapter, on-farm hygienic milk production is defined as the control of the microbial contamination of bulk milk tank. Microbial control includes minimization of microbial sources in the farm environment, minimization of microbial transmission, prevention of microbial growth and infection of animals and maximization of microbial inactivation and removal. Microorganisms are present in all parts of the farm environment. Many aspects of farm management e.g. feed management, facility hygiene and milking operations are involved in the control of the microbial contamination of bulk tank milk. However, the total bacterial count will also be affected by factors that are independent of farm management, such as seasonal variations (FAO, 2003).

The adoption of Product Processing technologies has been implemented throughout the food and dairy industry in Asian countries, and it is a science-based quality management system developed to ensure the production of safe foods that ensures performance.

Guidelines for the application of Product Processing technologies can be found in the Codex Alimentarius Code of Practice (FAO, 2003). Application of Product Processing technologies principles to dairy farms is discussed, but considered to be not yet generally feasible. The necessity for critical multidisciplinary review of management processes, difficulties in establishing limits via the identification of critical control points, the use of routine surveillance procedures and effective record keeping and documentation of standard processes restrict the widespread adoption of Product Processing technology programme to dairy farms (Ruegg, 2003).

As an alternative to Product Processing technologies, the formulation of guides to good farming practices has been proposed for example in Kenya (European Commission, 2004). These guides should encourage the use of appropriate hygiene practices at farm level; however, the International Dairy Federation (IDF) and the Food and Agriculture Organization (FAO) of the United Nations have developed such a guide (Morgan, 2004). The central objective is that the milk should be produced from healthy animals under generally accepted conditions. Good dairy farming practices require that people working and supervising at the farm are skilled in animal husbandry, hygienic milking of animals and administration of veterinary drugs. The guide contains guidelines with respect to different aspects of farm management.

Product Processing technologies have been criticized in the dairy processing industry as it can contribute to food borne illness outbreaks. As processing plants have become larger, they handle larger volumes of products sometimes from many different sources and distribute them over a broader geographic area.

## **2.6 Conceptual Framework**

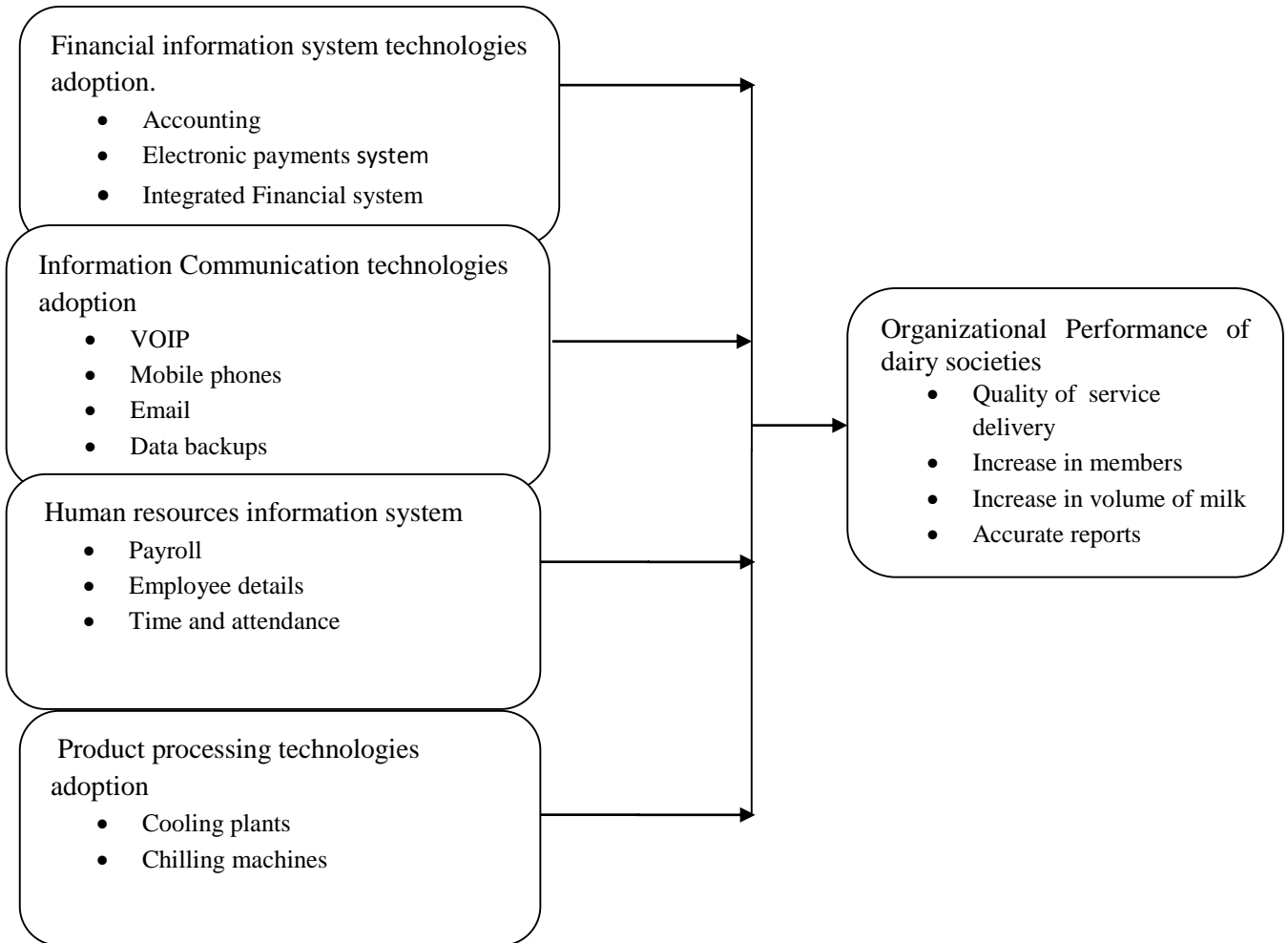
The independent variable in this study was Financial information system technologies adoption, Information Communication technologies adoption, Human resources information system technologies adoption, Product processing technologies adoption. The dependent variable was organizational performance of dairy societies,

operationalized as Quality of service delivery, Increase in members, production of accurate reports and increase in volume of milk

**Independent Variables**

**Dependent**

**Variable**



**Figure 2.1: Effect of technology adoption on organization performance**

**Source: Author Conceptualization (2015)**

The conceptual framework in figure 2.1 shows the independent variable of the study, financial technologies adoption operationalized in terms of Accounting, electronic payments system, integrated Financial information system. Information Communication technologies adoption operationalized as Mobile phones, Email and VOIP. Human

resources information system operationalized as Payroll, employee details, time and attendance. Product processing technologies adoption such as cooling plants and chilling machines. When an organization adopts technology in its operations, the business is likely to attain high performance which measurements include quality of service delivery, increase in members and increase in volume of milk.

## **2.7 Research Gap**

From the review of literature, it is clear that there is a research gap in the study of the performance of dairy societies in Kenya. The studies linking technology and performance of dairy societies have been conducted outside the Kenyan borders, further, these studies have been qualitative in nature and most of them have been limited only to descriptive statistics without more advanced statistics which can give a clear conclusion on how technology affect performance dairy societies. Limited studies have been conducted on the effect of technology on performance of Dairy Societies in Kenya, particularly in Uasin Gishu County.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Study Area**

The study was carried out in the Uasin Gishu County in Kenya which lies within the Great Rift Valley. The Region is one of the main Agricultural Region in Kenya. Dairy and maize farming is a major Agricultural activity.

#### **3.2 Research Design**

The study adopted the explanatory research design. An explanatory study uses theories or hypotheses to account for the forces that caused a certain phenomenon to occur. It goes beyond description and attempts to explain the reasons for the phenomenon. Orodho (2003) explained that an explanatory study analyses the cause-effect effect between two or more variables. This design was best since the study was of cause-effect nature.

#### **3.3 Study Population**

A Census of 20 dairy societies in Uasin Gishu County as per records in the County Agriculture director's office, 2013. In the study, the dairy societies' management was the primary units of analysis. The management involved the heads of the four departments together with their deputies and the Chief executive officer or the head of the dairy society. These were appropriate as they were accessible and had sufficient information that assisted in the study.

#### **3.4 Sampling Technique**

A census of all 20 dairy societies in Uasin Gishu was done. Purposive sampling was used to select 180 respondents as shown in the table below for each of the four heads of departments and one Chief executive officer each dairy society.

**Table3.1 Target Population**

<b>Sub county</b>	<b>Dairy co-operatives</b>	<b>Respondents</b>	<b>Total Number of respondents</b>
Ainabkoi Sub-county	3	9	27
Kapseret Sub-county	4	9	36
Kesses Sub- County	3	9	27
Moiben Sub - County	3	9	27
Soy-Sub County	3	9	27
Turbo Sub County	4	9	36
<b>TOTAL</b>	<b>20</b>	<b>9</b>	<b>180</b>

Source: County agriculture director's office, 2013.

### **3.5 Data Collection**

The primary data for the study was obtained using questionnaires. A pre-tested questionnaire consisting of both open ended and closed ended questions was used to collect data. Since information was collected directly from the management, a questionnaire was the most convenient instrument for the study. The questionnaire was presented to each respondent with a five likert type scale, where the study represented; strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. The questionnaire was administered using drop and pick later system.

### **3.6 Validity**

Fraenkel and Wallen (2000) and Mugenda and Mugenda (1999) define validity as the degree to which results obtained from the analysis of collected data actually represents the phenomena under study. To improve on the appropriateness, meaningfulness and usefulness of the findings and inferences of the study, the validity of the questionnaire was assessed by ensuring it captures meaningful information as intended by the



researcher. The content validity was determined by discussing the relevance of the instrument with colleagues, experts and the supervisor.

### **3.7 Reliability**

According to Orodho (2004), reliability of instruments concerns the degree to which a particular measuring procedure gives similar results over a repeated trial. Because reliability is synonymous with consistency, the major source of unreliable measurements is random error. The reliability of the questionnaire was tested using the minimally acceptable Cronbach Alpha coefficient of 0.7. In this research the questionnaires were pre-tested on 2 dairy societies in Nandi County.

#### **3.7.1 Reliability results**

The following was pretest results from two dairy societies in Nandi County; it showed that it was within the minimally acceptable Cronbach Alpha coefficient of 0.7

**Table 3.2 Reliability results**

	<b>Cronbach Alpha coefficient</b>
Financial information system technologies	0.715
Information Communication technologies	0.785
Human Resource Information system technologies	0.819
Product processing technologies	0.791
Organizational performance	0.724

From the above table, the instrument yielded a reliability coefficient of between 0.715 and 0.819 which is more than the recommended threshold of 0.7

### 3.8 Data Analysis

Once the questionnaires were collected by the researcher, they were coded and keyed into the SPSS computer software for analysis. Data was based on the objectives and research hypotheses of the study. Quantitative data collected was analysed using descriptive statistical techniques which are frequencies, mean and standard deviation. Measures of central tendency gave expected summary statistics of the variables tested. The findings were presented by use of frequency distribution tables that give record of a number of times a score or a response occurs. Inferential statistics such as Pearson moment correlations was used to establish the effect between variables. Multiple regression model was used to establish the effect and to test the hypotheses. The hypotheses were tested at a significance level of 0.05. The multiple linear regression model is as shown below:

$$y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

Y = performance

$\alpha$  = Alpha (constant)

$\beta_1 \dots \beta_3$  = the slope representing degree of change in independent variable by one unit variable

$X_1$  = Financial information system technologies adoption

$X_2$  = Communication technologies adoption

$X_3$  = Human resources information system

$X_4$  = Product Processing technologies adoption

$\varepsilon$  is error term (represents all other factors which influence the dependent variable other than the independent variables in the study).

### **3.9 Ethical Considerations**

Permission to carry out the study was sought from the relevant authority and from the dairy corporative who participated in the study (Kombo & Tromp, 2009). The researcher took into account the effect of the research on employees and acted in a way that protected their decorum. Ethics are norms for conduct that distinguishes between acceptable and unacceptable behaviour. A number of ethical issues can arise during the academic research writing and publishing process. These include plagiarism, fabrication or falsification of data, conflicts of interest, confidentiality, treatment of human subjects and animals in research and authorship issues (Hammersley & Traianou, 2012).

In this study, the researcher assured respondents that the information given will be used for academic purposes only. This was done to ensure honest information was given and also to enhance the process of data collection. The researcher assured the participants that nobody will be questioned about any information they will give, moreover, no names or personal identification numbers were reflected in the questionnaire, the numbering of the questionnaires was for ordering purpose only. In this study therefore, the researcher shared research findings after completion of study.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Responses Rate

Out of 180 questionnaires distributed to the respondents, 118 questionnaires were returned, which gives a response rate of approximately 65.55% percent.

#### 4.2 Demographic Characteristics

The researcher sought to establish the demographic information of the respondents paying close attention to their level of professional qualification, job tenure and employment status. The level of professional qualification of the respondents was put into account. As evidenced in table 4.1, majority 50.8% (60) of the respondents have a Diploma, 24.6% (29) degree, 18.6% (22) certificate level of education while 5.9% (7) are at secondary level precisely form four. It appears therefore that respondents were in a better position to assess the effect of technology adoptions on organization performance of dairy societies. Precisely, most of the respondents had a Diploma hence they were reliable to give relevant information as sought by the study.

In terms of job tenure, 42.4% (50) of the respondents have worked in the organization for 3-5 years, 30.5% (36) of them for 2 years and below, and 27.1% (32) of the respondents have worked for 6 years and above in the organization As a result, majority of the respondents were experienced and had the ability to make comprehensive decisions, leading to improved organizational performance. In terms of employment status, 61.9% (73) of the respondents are on contract, 31.4% (37) are employed permanently and 6.8% (8) of the respondents are under casual employment.

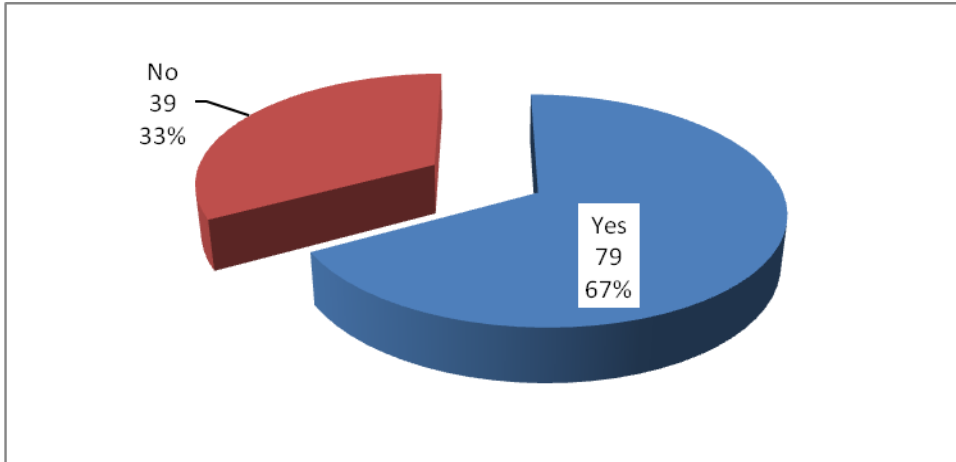
**Table 4.1 Demographic Characteristics**

		Frequency	Percent
Level of professional qualification	Certificate	22	18.6
	Diploma	60	50.8
	Degree	29	24.6
	Any other - form four	7	5.9
	Total	118	100
Job tenure	Less than 2yrs	36	30.5
	2-5yrs	50	42.4
	6yrs and above	32	27.1
	Total	118	100
Employment status	Permanent	37	31.4
	Contract	73	61.9
	Casual	8	6.8
	Total	118	100

Source-Field data (2015)

### 4.3 Dairy societies have financial information system technologies

The researcher found it necessary to establish the dairy societies that have financial information system technologies. The results are as presented in figure 1. As evidenced in the figure, 67% (79) of the respondents noted that their dairy societies have Financial information system technologies though 33% (39) of the respondents noted that their dairy societies lack Financial information system technologies.



**Figure 4.1 Dairy societies have financial information system technologies**

**Source-Field data (2015)**

#### **4.3.1 Financial information system technologies available**

The researcher found it necessary to establish the financial information system technologies available in the dairy societies. Table 4.2 illustrates the results. As shown in the table, 83.1% (98) of the respondents stated that there is computerized budgeting, 78.8% (93) integrated Financial information system management information systems, 78% (92) enterprise resource planning and 75.4% (89) of the respondents stated that computerized accounting systems are available in their dairy societies.

**Table 4.2 Financial information system technologies available**

		<b>Frequency</b>	<b>Percent</b>
Integrated Financial information system management information systems	Yes	93	78.8
Enterprise resource planning	Yes	92	78
Computerized budgeting	Yes	98	83.1
Computerized accounting systems	Yes	89	75.4

**Source-Field data (2015)**

### **4.3.2 Financial information system technologies adoption**

In this section of the analysis, the researcher sought to determine the effect of financial information system technologies adoption and organization performance of dairy societies. According to Gloy and Akridge (2000) there has been a push by dairy societies towards the adoption of financial information system technologies and this has led to improved performance of the dairy societies. This prompted the study to establish if indeed the adoption of financial information system technologies has had an influence on the performance of dairy societies. Table 4.3 illustrates the results.

From the results in the table, 66.9% (79) of the respondents strongly agreed that the society has a Financial information system which assists them to know the state of payment transactions (mean = 4.52, SD = 0.79). Also, 68.6% (81) of the respondents affirmed that the society has Financial information system which assists them to serve clients faster and easier (mean = 4.49, SD = 0.98). Further, 59.3% (70) of the respondents affirmed that the society has Financial information system which assists them to complete their auditing task more quickly using computerized Financial information system (mean = 4.19, SD = 1.32). Similarly, 41.5% (49) of the respondents agreed that the society's Financial information system increases their efficiency and effectiveness in utilizing auditing services ( mean = 4.16, SD = 0.88).

Besides, 47.5% (56) of the respondents strongly agreed that the society has Financial information system which assists them to solve public complaints on bills and other transactions (mean = 4.14, SD = 1.11). In addition, 42.4% (50) of the respondents strongly agreed that the society has Financial information system which assists them to make decisions faster (mean = 4.07, SD = 1.08). Further, 54.2% (64) of the respondents strongly agreed that the society has a Financial information system which assists them to track any transaction faster and easier (mean = 3.94, SD = 1.37).

Finally, 39.8% (47) of the respondents strongly agreed that the society has Financial information system which assists them to perform auditing task even at home using their laptop (mean = 3.53, SD = 1.53). Based on the mean values ranging from 3.53 to 4.52

implying that the adoption of financial information system technologies has a positive influence on the performance of dairy societies.

Consistently, Ott and Rendleman (2000) in their study conducted in the United States dairy firms on Financial information system technologies found out those dairy firms are significant users of Financial information system technologies and that these technologies are instrumental in enhancing their performance. Further support to the study findings is by Ball (2006) who stated that developing countries like Kenya that are characterized by low quality of local governance institutions, adopt Financial information system technologies in order to benefit from improved performance.



**Table 4.3 Financial information system technologies adoption**

		SD	D	N	A	SA	Mean	Std. Deviation
The society has Financial information system which assists to complete auditing task more quickly using computerized Financial information system	Freq.	15	1	0	32	70	4.19	1.32
	%	12.7	0.8	0	27.1	59.3		
The society has Financial information system which assists to perform auditing task even at home using my laptop	Freq.	21	12	16	22	47	3.53	1.53
	%	17.8	10.2	13.6	18.6	39.8		
The society has Financial information system which increases efficiency and effectiveness in utilizing auditing services	Freq.	0	8	13	49	48	4.16	0.88
	%	0	6.8	11	41.5	40.7		
The society has Financial information system which assists to know the state of payment transactions	Freq.	0	4	10	25	79	4.52	0.79
	%	0	3.4	8.5	21.2	66.9		
The society has Financial information system which assists to solve public complaints on bills and other transactions	Freq.	7	4	11	40	56	4.14	1.11
	%	5.9	3.4	9.3	33.9	47.5		
The society has Financial information system which assists to serve customers faster and easier	Freq.	5	3	2	27	81	4.49	0.98
	%	4.2	2.5	1.7	22.9	68.6		
The society has Financial information system which assists to make decisions faster	Freq.	7	2	17	42	50	4.07	1.08
	%	5.9	1.7	14.4	35.6	42.4		
The society has Financial information system which assists to track any transaction faster and easier	Freq.	11	10	18	15	64	3.94	1.37
	%	9.3	8.5	15.3	12.7	54.2		

**Source-Field data (2015)****4.4 Human Resources Information System**

The researcher examined the effect of human resource information system on organization performance of dairy societies. The results are as presented in table 4.4. As shown in the table, 58.5% (69) of the respondents strongly agreed that there is increased efficiency of payroll process (mean = 4.42, SD = 0.85). Similarly, 59.3% (70) of the

respondents strongly agreed that the society has computerized human resources system which produces reports summarizing different aspects of information (mean = 4.3, SD = 1.02). In a similar vein, 51.7% (61) of the respondents strongly agreed that the society has computerized human resources system which records and analyzes absence, attendance and labor turnover (mean = 4.25, SD = 1.07). Further, 44.9% (53) of the respondents agreed that the society has computerized human resource system which holds personal details about individual employees including career history, skills and qualifications, leave and absence record (mean = 4.19, SD = 0.87). Additionally, 51.7% (61) of the respondents agreed that the society has computerized human resources system which increases access to human resource data (mean = 4.15, SD = 1.15). Also, 44.9% (53) of the respondents strongly agreed that the society has computerized human resources system which holds details about employees jobs including grade, pay and benefits, hours, locations, job description or role definition (mean = 4.14, SD = 0.9).

Besides, 52.5% (62) of them agreed that the society has computerized human resources system which streamlines and standardizes processes (mean = 3.75, SD = 1.28). However, 66.1% (78) of the respondents strongly disagreed that recruitment is done online (mean = 1.79, SD = 1.3). Cognate to the results, Walker (2001) in his study of dairy societies in the UK found out that HRIS is used to acquire, store, manipulate, analyze, retrieve and distribute pertinent information about an organization's human resources hence improving organizational performance. Similarly, Lengnick-Hall and Moritz (2003) postulated that HRIS will create informational efficiencies and cost savings such that there will be more accurate data upon which to base decisions hence improved performance. Furthermore, Brown & Steven, (2008) posit that a number of companies have adopted the use of HRIS in order to keep up with new technology and to have a competitive advantage over other organizations.

**Table 4.4 Human Resources Information System**

		SD	D	N	A	SA	Mean	Std. Deviation
The society has computerized human resources system which increases access to human resource data	Freq. %	8 6.8	3 2.5	13 11	33 28	61 51.7	4.15	1.15
The society has computerized human resource system which holds personal details about individual employees including career history, skills and qualifications, leave and absence record	Freq. %	0 0	9 7.6	8 6.8	53 44.9	48 40.7	4.19	0.87
The society has computerized human resources system which holds details about employees jobs including grade, pay and benefits, hours, locations, job description or role definition	Freq. %	0 0	4 3.4	28 23.7	33 28	53 44.9	4.14	0.9
The society has computerized human resources system which produces reports summarizing different aspects of this information	Freq. %	2 1.7	8 6.8	13 11	25 21.2	70 59.3	4.3	1.02
The society has computerized human resources system which records and analyzes absence, attendance and labor turnover	Freq. %	8 6.8	8 6.8		41 34.7	61 51.7	4.25	1.07
The society has computerized human resources system which streamlines and standardizes processes	Freq. %	17 14.4	2 1.7	6 5.1	62 52.5	31 26.3	3.75	1.28
There is increased efficiency of payroll process	Freq. %	3 2.5		10 8.5	36 30.5	69 58.5	4.42	0.85
Recruitment is done online in our society	Freq. %	78 66.1	12 10.2	14 11.9	3 2.5	11 9.3	1.79	1.3

#### 4.5 Information Communication Technologies adoption

The researcher deemed it important to establish the effect of Product Processing technologies on organizational performance of dairy societies. Previous studies like that of Trant (2002) revealed that the use of ICT facilitates in the gathering and processing of

data, subsequent storing, distributing and communicating information, hence improved organizational performance. The researcher therefore found it necessary to establish if the findings of the study conform or is contrary to studies on the same. The results of the study are presented in table 4.5. As evidenced in the table, 50.8% (60) of the respondents strongly agreed that they undertake data backups in their society (mean = 4.17, SD = 1.18). Similarly, 39.8% (47) of the respondents agreed that they use computer mediated text transfers for record keeping purposes (mean = 3.47, SD = 1.44).

As well, 43.2% (51) of the respondents agreed that they have telephones which they use to communicate with their fellow colleagues in other departments. However, 51.7% (61) of the respondents strongly disagreed that they have video mediated conference facility which they are using during meetings at the department ( mean = 1.9, SD = 1.28). Also, 64.4% (76) of the respondents strongly disagreed that they work better with their colleagues in different geographical areas using video mediated conference (mean = 1.81, SD = 1.19).

Consistently, Sloan (2001) argues that the adoption of ICT by organizations creates the premises for the emergence of competitive advantages hence improved performance. In the same way, De Vinals (2001) argues that ICT-solutions help dairy societies to increase their productivity hence achieving higher business performance. Furthermore, prior studies by Oliner and Sichel (2000), Jorgenson and Stiroh (2000), and Baily and Lawrence (2001) revealed that ICT adoption in the dairy sector has a positive impact on performance. In addition, Brynjolfsson and Hitt (2003) posit that substantial long-term productivity gains and performance in dairy societies result from adoption of ICT.

**Table 4.5 Information Communication Technologies adoption**

		SD	D	N	A	SA	Mean	Std. Deviation
We have telephones which we use to communicate with our fellow colleagues in other departments	Freq. %	35 29.7	10 8.5	5 4.2	51 43.2	17 14.4	3.04	1.52
We have video mediated conference facility which is used during meetings at the department	Freq. %	61 51.7	38 32.2	0 0	8 6.8	11 9.3	1.9	1.28
We work better with our colleagues in different geographical areas using video mediated conference	Freq. %	76 64.4	8 6.8	17 14.4	15 12.7	2 1.7	1.81	1.19
We use computer mediated text transfers for record keeping purposes	Freq. %	24 20.3	4 3.4	13 11	47 39.8	30 25.4	3.47	1.44
We undertake data backups in our society	Freq. %	10 8.5	3 2.5	4 3.4	41 34.7	60 50.8	4.17	1.18

Source-Field data (2015)

#### 4.6 Product processing technologies

This section of the analysis put into account the effect of Product Processing technologies and performance. The results are as presented in table 4.6. As shown in the table, 86.4% (102) of the respondents strongly agreed that they have coolers which help to store milk especially excess thus reducing wastage ( mean = 4.84, SD = 0.49). In the same way, 48.3% (57) of the respondents strongly agreed that they have chilling machines in their society ( mean = 4.08, SD = 1.26). However, the respondents were not sure whether an online filing system was in place in the society ( mean = 2.72, SD = 1.4). This is in line with a study conducted by Lacobbo (2006) in the US that revealed that the

implementation of Product Processing technologies in the dairy industry has contributed to improved performance. Furthermore, findings by IDF, (2006) reveals that Product Processing technologies are being developed in order to ensure a good microbial quality of bulk tank milk and this is a proof of performance in the dairy societies.

**Table 4.6 Product Processing technologies**

		SD	D	N	A	SA	Mean	Std. Deviation
We have coolers which help to store milk especially excess reducing wastage	Freq.	1	0	0	15	102	4.84	0.49
	%	0.8	0	0	12.7	86.4		
We have chilling machines in our society	Freq.	12	4	4	41	57	4.08	1.26
	%	10.2	3.4	3.4	34.7	48.3		
We have an online filing system in place in our society	Freq.	30	26	29	13	20	2.72	1.4
	%	25.4	22	24.6	11	16.9		

**Source-Field data (2015)**

#### **4.7 Grade Means and Normality test**

The findings in table 4.7 provide descriptive statistics for all variables. Results showed that financial information system technologies adoption had the highest mean of 4.1292. This implies that there was high adoption of financial information system technologies with minimal adoption of information communication technologies. Further, to test the normality distribution the study examined the Skewness and kurtosis values. Skewness is used to measure the symmetry of a distribution while kurtosis is used to measure the peakness or flatness of a distribution (Tabachnick and Fidell, 2007). Based on the results, the values of Skewness and kurtosis revealed that the data was normally distributed where the Skewness values was in the range of -1.006 to 0.088. The value for kurtosis, on the other hand, was in the range of -0.427 to 1.158 well below the threshold of +/- 10.

**Table 4.7 Grade Means and Normality test**

	Mean	Std. Deviation	Skewness	Kurtosis
Organizational performance	4.1111	0.58127	-0.544	0.08
Financial information system technologies adoption	4.1292	0.66905	-0.743	-0.427
Human resources information system	3.8729	0.55686	-0.711	0.215
Information communication technologies adoption	2.8763	0.83304	0.088	-0.245
Product Processing technologies	3.8785	0.76815	-1.006	1.158

**Source-Field data (2015)**

#### **4.8 Dairy Society's organizational performance**

This section of the analysis sought to establish the dairy society's organizational performance. Table 4.8 illustrates the results of the study. As stipulated in the table, 61.9% (73) of the respondents agreed that they are able to produce accurate statements and reports for their customers in the dairy society (mean = 4.62, SD = 0.49). Also, 57.6% (68) of the respondents agreed that with the technology they have, their dairy society is able to perform most of the tasks very effectively (mean = 4.36, SD = 0.94). As well, 49.2% (58) of the respondents strongly agreed that with technologies they have realized increase in their customer numbers in their dairy society (mean = 4.16, SD = 1.03). Further, 51.7% (61) of them agreed that they have realized increase in milk supply in their dairy society due to the technologies they have adopted (mean = 4.09, SD = 1.21).

Moreover, 39% (46) of them strongly agreed that they continuously review their service quality to make it exemplary (mean = 4.08, SD = 0.89). Similarly, 40.7% (48) of the respondents agreed that technology adoption has made their services unique compared to other competitors (mean = 3.86, SD = 1.13). Additionally, 64.4% (76) of the respondents agreed that their society has the best customer relations due to technology adoption (mean = 3.75, SD = 1.02). However, 22% (26) of the respondents were sure that many

members have shifted to their society due to superior customer care (mean = 3.41, SD = 1.45). It can therefore be inferred that technology has enabled dairy societies to produce accurate statements and reports for customers in the dairy societies, to perform most of the tasks very effectively, increase customer numbers and make services unique compared to other competitors.

**Table 4.8 Dairy Society's organizational performance**

		SD	D	N	A	SA	Mean	Std. Deviation
With technologies we have realized increase in our customer numbers in our dairy society	Freq.	4	3	21	32	58	4.16	1.03
	%	3.4	2.5	17.8	27.1	49.2		
We are able to produce accurate statements and reports for our customers in our dairy society	Freq.	0		45	73	0	4.62	0.49
	%	0	0	38.1	61.9	0		
We have realized increase in milk supply in our dairy society due to the technologies we have adopted	Freq.	10	20	27	61	0	4.09	1.21
	%	8.5	16.9	22.9	51.7	0		
With technology we have, our dairy society is able to perform most of the tasks very effectively	Freq.	2	6	8	34	68	4.36	0.94
	%	1.7	5.1	6.8	28.8	57.6		
We continuously review our service quality to make it exemplary	Freq.	1	2	30	39	46	4.08	0.89
	%	0.8	1.7	25.4	33.1	39		
Many members have shifted to our society due to superior customer care	Freq.	24	3	26	31	34	3.41	1.45
	%	20.3	2.5	22	26.3	28.8		
Our society has the best customer relations due to technology adoption	Freq.	8	8	8	76	18	3.75	1.02
	%	6.8	6.8	6.8	64.4	15.3		
Technology adoption has made our services unique compared to other competitors	Freq.	6	11	15	48	38	3.86	1.13
	%	5.1	9.3	12.7	40.7	32.2		

**Source-Field data (2015)**



#### **4.9 Correlation Results**

Correlation analysis is a technique of assessing the effect between variables: Product Processing technologies, Information Communication technologies adoption, Human Resources Information System and Financial information system Technologies adoption with organizational performance. Thus, the study analyzed the effects that are inherent among the independent and dependent variables. The results regarding this were summarized and presented in Table 4.9.

Findings revealed that Financial information system Technologies adoption was positively and significantly associated with organizational performance ( $r = 0.771$ ,  $\rho < 0.01$ ). Further, Product Processing Technologies were positively and significantly correlated to organizational performance ( $r = 0.663$ ,  $\rho < 0.01$ ).

Moreover, Information Communication Technologies Adoption was positively correlated with organizational performance ( $r = 0.503$ ,  $\rho < 0.01$ ). Additionally, Human Resources Information System was indicated to be positively related with organizational performance ( $r = 0.409$ ,  $\rho < 0.01$ ). This implies that Product Processing technologies, Information Communication Technologies adoption, Human Resources Information System, Financial information system Technologies adoption are expected to influence organizational performance.

**Table 4.9 Correlation Results**

	Organizational performance	Financial information system technologies adoption	Human resources information system	Information communication technologies adoption	Product Processing technologies
Organizational performance	1 0				
Financial information system technologies adoption	.771** 0.000	1			
Human resources information system	.409** 0.000	.476** 0.00	1		
Information communication technologies adoption	.503** 0.000	.419** 0.00	0.105 0.259	1	
Product Processing technologies	.663** 0.000	.673** 0.000	.503** 0.000	.455** 0.000	1

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

**Source: Field Data (2015)**

## **4.10 Regression Statistics**

### **4.10.1 Model Summary**

Table 4.10 illustrates the model summary of multiple regression model, the results showed that all the four predictors (Product Processing Technologies, Information Communication Technologies Adoption, Human Resources Information System and Financial information system Technologies Adoption) explained 65.7 percent variation of

organizational performance. This showed that considering the four study independent variables, there is a probability of predicting organizational performance by 65.7% (R squared =0.657).

**Table 4.10 Model Summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.810a	0.657	0.645	0.34653	1.722

a Predictors: (Constant), Product Processing Technologies, Information Communication Technologies Adoption, Human Resources Information System, Financial information system Technologies Adoption

b Dependent Variable: Organizational Performance

Source: Field Data (2015)

#### 4.10.2 ANOVA Model

Study findings in ANOVA table 4.11 indicated that the above discussed coefficient of determination was significant as evidenced by F ratio of 54.05 with p value 0.000 <0.05 (level of significance). Thus, the model was fit to predict organizational performance using Product Processing Technologies, Information Communication Technologies Adoption, Human Resources Information System and Financial information system Technologies Adoption.

**Table 4.11 ANOVA Model**

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	25.962	4	6.49	54.05	.000
Residual	13.569	113	0.12		
Total	39.531	117			

a Dependent Variable: Organizational Performance

b Predictors: (Constant), Product Processing Technologies, Information Communication Technologies Adoption, Human Resources Information System, Financial information system Technologies Adoption

**Table 4.12 Coefficient of Estimate**

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	1.005	0.286		3.51	0.001		
Financial information system technologies adoption	0.456	0.065	0.55	7.042	0.000	0.498	2.008
Human resources information system	0.031	0.07	0.03	0.447	0.656	0.682	1.467
Information communication technologies adoption	0.189	0.067	0.18	2.804	0.006	0.737	1.356
Product Processing technologies	0.147	0.061	0.196	2.402	0.018	0.457	2.188

a Dependent Variable: organizational performance

**Source: Field Data (2015)**

#### **4.11 Hypothesis testing**

Multiple regression analysis was conducted so as to determine the effect of technology adoption on organizational performance of dairy societies in Uasin Gishu County. The regression equation becomes:

$$\text{Organizational performance of dairy societies} = (1.005) + X_1(0.55) + X_2(0.03) + X_3(0.18) + X_4(0.196) + \varepsilon$$

According to the regression equation, taking all factors into account (Financial information system technologies, Human Resource information system Information communication technologies adoption and Product Processing technologies), the constant will be 1.005. The model had positive coefficients. Hypothesis testing is based

on standardized coefficients beta and p-value to test whether the hypotheses are rejected or not.

**Hypothesis 1 (H<sub>01</sub>)** stated that Financial information system technologies adoption has no significant effect on organizational performance. Findings showed that Financial information system technologies adoption had coefficients of estimate which was significant basing on  $\beta_1 = 0.55$  (p-value = 0.000 which is less than  $\alpha = 0.05$ ). The null hypothesis was thus rejected and it was concluded that Financial information system technologies adoption had a significant effect on organizational performance. This suggested that there was up to 0.55 unit increase in organizational performance for each unit increase in Financial information system technologies adoption.

**Hypothesis 2 (H<sub>02</sub>)** stated that human resources information system had no significant effect on organizational performance. Research findings showed that human resource information system had coefficients of estimate which was insignificant basing on  $\beta_2 = 0.03$  (p-value = 0.656 which was more than  $\alpha = 0.05$ ) hence the null hypothesis was accepted.

**Hypothesis 3 (H<sub>03</sub>)** postulated that information communication technology adoption had no significant effect on organizational performance. Findings showed that information communication technology adoption had coefficients of estimate which was significant basing on  $\beta_3 = 0.18$  (p-value = 0.006 which is less than  $\alpha = 0.05$ ) implying that the null hypothesis was rejected and it was concluded that information communication technology adoption has significant effect on organizational performance. This indicated that for each unit increase in information communication technology adoption, there was up to 0.18 units increase in organizational performance.

**Hypothesis 4 (H<sub>04</sub>)** postulated that Product Processing technologies adoption had no significant effect on organizational performance. However, study findings showed that Product Processing technologies adoption had coefficients of estimate which was significant basing on  $\beta_4 = 0.196$  (p-value = 0.018 which was less than  $\alpha = 0.05$ ) hence we did not accept the null hypothesis and concluded that Product Processing technologies

adoption had a significant effect on organizational performance. This indicated that for each unit increase in Product Processing technologies adoption, there was up to 0.196 units increase in organizational performance.

The rule of thumb was applied in the interpretation of the variance inflation factor. From table 4.12, the VIF for all the estimated parameters was found to be less than 4 which indicated the absence of multicollinearity among the independent factors (Hair, *et al.*, 2010). This implied that the variation contributed by each of the independent factors was significant independently and all the factors were included in the prediction model.

#### **4.11.1 Discussion of the Findings**

#### **4.11.2 Financial information systems technology adoption**

Research findings revealed that Financial information systems technology has a positive and significant effect on organizational performance basing on  $\beta_1 = 0.55$  (p-value = 0.000 which is less than  $\alpha = 0.05$ ). This implies that Financial information systems technology has an impact on organizational performance. This is in line with the study done by Ball (2006) who established that many developing countries like Kenya where the quality of local governance institutions is low, the decision to adopt financial information system technologies would be beneficial in ensuring performance. Rendleman (2000) argued that dairy societies are significant users of financial information system technologies

#### **4.11.3 Information communication technology**

As evidenced in the study, Information communication technology showed a positive and significant effect on organizational performance basing on  $\beta_2 = 0.03$  (p-value = 0.006 which is less than  $\alpha = 0.05$ ). This means the Information communication technology has significant effect on organizational performance of dairy societies. According to De Vinals (2001), observed that ICT has positively influenced dairy societies to increase their productivity and achieve higher business performance. Consistently, Sloan (2001) argues that the adoption of ICT by organizations creates the premises for the emergence of competitive advantages hence improved organizational performance. In the same way, De Vinals (2001) argues that

ICT-solutions help dairy societies to increase their productivity hence achieving higher business performance. Furthermore, prior studies by Oliner and Sichel (2000), Jorgenson and Stiroh (2000), and Baily and Lawrence (2001) revealed that ICT adoption in the dairy sector has a positive impact on performance.

#### **4.11.4 Human Resources Information System**

The study results revealed human resources information system has no positive and significant effect on organizational performance as shown by  $\beta_3 = 0.03$  (p-value = 0.656 which is less than  $\alpha = 0.05$ ). Hence the null hypothesis was accepted. This is contrary to study done by Bussler & Davis, (2002) that human resources information system has an influence on organizational performance. The results is also contrary to the case study done in Kenya by Limuru Cooperative Society where it was established that HRIS has a significant influence on organization performance of dairy societies

#### **4.11.5 Product Processing technologies**

Product Processing technologies was found to have a positive and insignificant effect on accessibility of microcredit basing on  $\beta_4 = 0.196$  (p-value = 0.018 which is less than  $\alpha = 0.05$ ). As such, the null hypothesis was rejected. This is in line with a study done Locobbo (2006) in the US where it was argued that food producers are responsible for the safety of their products therefore dairy societies need to adopt these technologies in order to safeguard safety of the milk products.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Summary of Findings

The study was carried out to assess the effect of technology adoption on organization performance, a case study of dairy societies in Uasin Gishu County. The study adopted explanatory research design. Data was collected by use of questionnaires. Data was analyzed using descriptive statistics and it revealed that majority of the respondents are Diploma holders that have worked for over two years in the dairy societies. Besides, majority of them are on contract with a few being on casual employment.

Findings revealed that Financial information system Technologies adoption was positively and significantly associated with organizational performance ( $r = 0.771$ ,  $p < 0.01$ ). It is evident that majority of the dairy societies have adopted Financial information system technologies. Specifically, it was confirmed by the respondents that there is computerized budgeting, integrated financial information system management information systems, and enterprise resource planning and computerized accounting systems. This is in line with the studies done by Ball (2006) and Rendleman (2000) who summarized that financial technology adoption has significant impact on organizational performance of dairy societies.

It was established that human resources information system had no significant effect on organizational performance. Research findings showed that human resource information system had coefficients of estimate which was insignificant basing on  $\beta_2 = 0.03$  ( $p\text{-value} = 0.656$  which was more than  $\alpha = 0.05$ ). This is contrary to study done by Bussler & Davis, (2002) that human resources information system has an influence on organizational performance.

Information Communication Technologies Adoption was positively correlated with organizational performance ( $r = 0.503$ ,  $p < 0.01$ ). The study revealed that ICT has enabled



data backups in the dairy societies and eased communication with fellow colleagues in other departments. However, there is limited use of video mediated conference facility during meetings at the department. De Vinals (2001), observed that ICT has positively influenced dairy societies to increase their productivity and achieve higher business performance.

Product Processing Technologies were positively and significantly correlated to organizational performance ( $r = 0.663, p < 0.01$ ), It was revealed that coolers are available in the dairy societies and they come in handy in storing excess milk thus reducing wastage. Chilling machines are also present though there is doubt whether there is an online filling system. This is in line with a study done Locobbo (2006) in the US where it was established that dairy societies need to adopt Product Processing technologies in order to safeguard safety of the milk products.

The results from the equation relating to organizational performance of dairy societies and financial information system technologies, information system technologies, Human Resources Information System technologies and product processing technologies were as follows:

$$y = (1.005) + X1 (0.55) + X2(0.18) + X3(0.03) + X4(0.196) + \epsilon$$

Results showed that all the four predictors (Product Processing Technologies, Information Communication Technologies Adoption, Human Resources Information System and Financial information system Technologies Adoption) explained 65.7 percent variation of organizational performance. This showed that considering the four study independent variables, there is a probability of predicting organizational performance by 65.7% ( $R^2 = 0.657$ ).

## **5.2 Conclusion**

The adoption of financial information system technologies has allowed dairy societies to increase in their performance in aspects such as productivity as well as quality of product.

This has been possible through faster decision making and increased efficiency and effectiveness in completing auditing tasks.

The findings of the study have revealed that the adoption of human resource information system has no significant effect on organization performance. This is contrary to prior studies that have established a positive link between the adoption of HRIS and organizational performance. The study has therefore added substantial insights into the current literature of HRIS adoption and its effect on organizational performance. It is therefore necessary for scholars to conduct a replication study on the same in order to argument the results of the study. It would be important to establish if indeed the HRIS would allow for the HR function to become more efficient to an extent that there is better information for decision making hence improved performance.

Additionally, the study has established that the adoption of ICT has a positive effect on organizational performance. The adoption of ICT in dairy societies changes the way in which information is processed, communication is conducted as well as services are made available. Therefore, organization that have adopted and made use of ICT exhibit increased productivity and higher business performance.

The adoption of Product Processing technologies is necessary for improved performance of dairy societies. Product processing technologies ensures that there is guaranteed food safety of dairy products.

The first hypothesis was rejected that financial technologies had a significant effect on organizational performance the results are consistent with other studies. It was established that Human Resources information system had no significant effect on organization performance and thus hypothesis two was accepted. Hypothesis three was also rejected, findings showed that information Communication technology adoption had a significant effect on organizational performance and lastly hypothesis four, product processing technology adoption was found to have significant effect on organizational performance.

From the results of the regression analysis, the management of the dairy societies should put more emphasis on Financial information system technology adoption as the first priority, Product processing technologies, Information communication technology and Human Resources information system technology in that order for better performance, as reflected in both Correlation and Regression Analyses.

### **5.3 Recommendations**

The policymakers should push for full adoption of Financial information systems technologies, Product processing technologies and ICT as a priority so as to give impetus to the dairy societies, they should develop policies meant to assist the dairy societies adopt these technologies faster.

The study has established that financial information system technologies are instrumental in enhancing the organizational performance of dairy societies. It would therefore be prudent for dairy societies to adopt financial information system technologies such as computerized budgeting, integrated financial management information systems, and enterprise resource planning so as to heighten their performance.

There is clear supportive evidence of an acceleration of productivity in dairy societies with the adoption of ICT. It is therefore important for organizations to not only adopt ICT but make use of ICT so as to have an advantage over competitors. Further, challenges such as high cost of telecommunications, lack of legislative support from the government, use of obsolete technologies, overall technological illiteracy and lack of qualified staff need to be tackled in order to reap the benefits of ICT adoption. Furthermore, in the context of dairy societies, it is important that they enhance the use of video mediated conference since it can facilitate communication with colleagues in different geographical areas.

Finally, it is evident that Product Processing technologies are essential for the quality and safety of milk and dairy products. It is therefore paramount for dairy societies to ensure that coolers are available so that they can store excess milk and reduce on wastage. This

will also guarantee food safety of dairy products. There is also need for chilling machines for excellent microbial quality of raw milk. With this put in place, there will be improved performance of dairy societies.

#### **5.4 Further Research Recommendations**

This study was conducted to assess the effect of selected technology adoptions on organization performance of dairy societies. The sample only drawn from dairy societies in Uasin Gishu County, thus this study may be limited in its generalizability of the findings. So, future research should have to draw sample of respondents from a larger scope for the sake of generalizing the results of the study. Also, this study recommends that further research be carried out to determine the effect of human resource information system on organizational performance of dairy societies since the study exhibited insignificant effect between the two variables.

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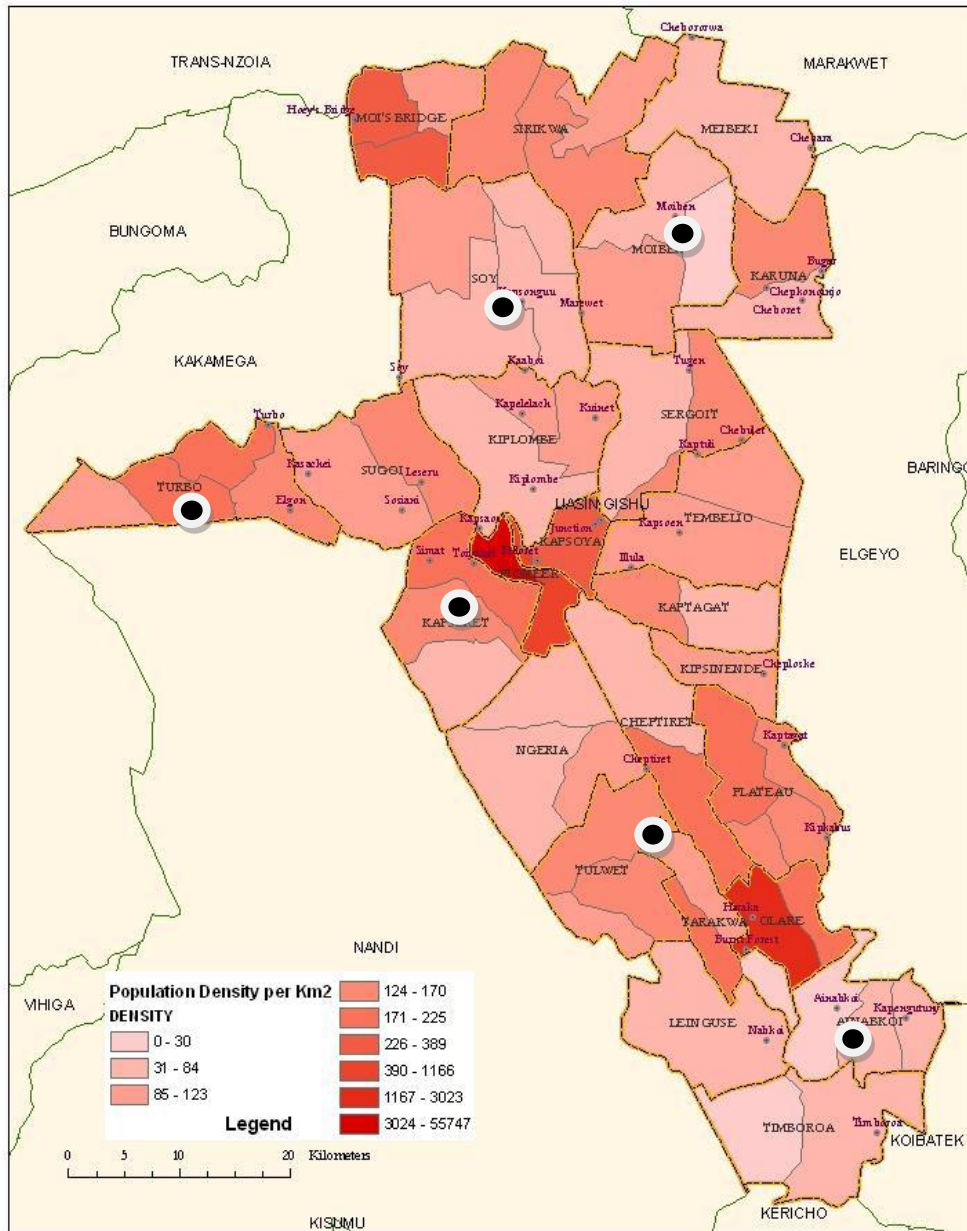
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# APPENDICES

## APPENDIX I: Study Area



Map of the study area: Uasin Gishu County, Source Uasin Gishu Plan 2005-2010

## APPENDIX II: Questionnaire

I am a MBA student at Egerton University. I am carrying out a research study entitled the. **“EFFECT OF TECHNOLOGY ADOPTION ON ORGANIZATIONAL PERFORMANCE OF DAIRY SOCIETIES IN UASIN GISHU COUNTY, KENYA**  
This questionnaire is therefore issued purely for academic purpose and the information provided will be treated confidential. Your corporation will be highly appreciated. Moreover your cooperation in ensuring that the questionnaires are answered will be highly appreciated. Please note that the information you give will be treated with confidence and will be used for academic purpose only.

### SECTION A: DEMOGRAPHIC INFORMATION

*(This Section is to be answered by all departments)*

In this section the study would like you to provide some background information about yourself.

Kindly tick (√) appropriately

1. Which is your level of professional qualification?

Certificate

Diploma

Degree

Masters

Any other (specify) .....

2. How long have you been working with the society? (Tick one)

Less than 2 years

3-5 years

6 years and above

3. What is your employment status?

Permanent

Contract

Casual

## SECTION B: FINANCIAL INFORMATION SYSTEM TECHNOLOGIES

### ADOPTION

*(This Section is to be answered by finance department only)*

Does the dairy society have any Financial information system technologies?

Yes  No

If yes which of the following does your dairy society have?

- i. Integrated Financial Management Information Systems
- ii. Enterprise resource planning
- iii. Computerized budgeting
- iv. Computerized accounting systems

This section the study is interested in your view about your Financial information system technologies adoption. Read each of the statements carefully and tick the appropriate choice.

Key SA- Strongly Agree, A- Agree, N- Neutral, D- Disagrees, SD – Strongly Disagree

	<b>Tick your response</b>	<b>SD (1)</b>	<b>D (2)</b>	<b>N (3)</b>	<b>A (4)</b>	<b>SA (5)</b>
1	The society has Financial information system which assists me to complete my auditing tasks more quickly using computerized Financial information system.					
2	The society has Financial information system which assists me perform auditing task even at home using my laptop.					
3	The society uses Financial information system to increase my efficiency and effectiveness in utilizing auditing services.					
4	The society has Financial information system which assists me to know the state of payment transactions.					
6	The society has Financial information system which assists me to solve public complaints on bills and other transactions.					
7	The society has Financial information system which assists me to serve public faster and easier.					

8	The society has Financial information system which assists me to make decision faster.					
9	The society has Financial information system which assists me to track any transaction faster and easier.					

### SECTION C: HUMAN RESOURCES INFORMATION SYSTEM

*(This Section is to be answered by Human Resources department only)*

This section the study is interested in your view about your adopted human resources information system. Read each of the statements carefully and tick the appropriate choice.

Key SA- Strongly Agree, A- Agree, N- Neutral, D- Disagrees, SD – Strongly Disagree

	<b>Tick your response</b>	<b>SD (1)</b>	<b>D (2)</b>	<b>N (3)</b>	<b>A (4)</b>	<b>SA (5)</b>
1	The society has computerized human resource information system which increases access to Human Resource data.					
2	The society has computerized human resource information system which holds personal details about individual employees including career history, skills and qualifications, leave and absence records.					
3	The society has computerized human resource information system which holds details about employees' jobs, including grade, pay and benefits, hours, locations, job description or role definition.					
4	The society has computerized human resource information system which produces reports summarizing different aspects of this information.					
6	The society has computerized human resource information system which records and analyzes absence, attendance and labour turnover.					
7	The society has computerized human resource information system which streamlines and standardizes processes.					
8	There is increased efficiency of payroll process.					
9	Recruitment is done online in our society.					



**SECTION D: INFORMATION COMMUNICATION TECHNOLOGIES  
ADOPTION**

*(This Section is to be answered by Information & Communications department only)*

This section the study is interested in your view about your adopted communication technologies. Read each of the statements carefully and tick the appropriate choice.

Key SA- Strongly Agree, A- Agree, N- Neutral, D- Disagrees, SD – Strongly Disagree

<b>Tick your response</b>	<b>SD (1)</b>	<b>D (2)</b>	<b>N (3)</b>	<b>A (4)</b>	<b>SA (5)</b>
We have telephones which we use to communicate with our fellow colleagues in other department.					
We have Video mediated conference facility which we are using during meetings at the department.					
We work better with our colleagues in different geographical areas using video mediated conference.					
We use computer mediated text transfers for record keeping purposes.					
We undertake data backups in our society.					

**SECTION E: PRODUCT PROCESSING TECHNOLOGIES**

*(This Section is to be answered by Stores/operations department only)*

This section the study is interested in your view about your adopted Product Processing technologies. Read each of the statements carefully and tick the appropriate choice.

Key SA- Strongly Agree, A- Agree, N- Neutral, D- Disagrees, SD – Strongly Disagree

<b>Tick your response</b>	<b>SD (1)</b>	<b>D (2)</b>	<b>N (3)</b>	<b>A (4)</b>	<b>SA (5)</b>
We have coolers which help to store milk especially excess reducing wastage.					
We have chilling machines in our society.					
We have an online filing system in place in our society.					

**SECTION F: DAIRY SOCIETY’S ORGANIZATIONAL PERFORMANCE**

*(This Section is to be answered by all the employees)*

<b>Tick your response</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
With technologies we have we have realized increase in our customer numbers in our dairy society					
We are able to produce accurate statements and reports for our customers in our dairy society.					
We have realized increase in milk supply in our dairy society due to the technologies we have adopted					
With technologies we have, our dairy society is able to perform most of the tasks very effectively.					
We continuously review our service quality to make it exemplary					
Many members have shifted to our society due to superior customer care					
Our society has the best customer relations due to technology adoption					
Technology adoption has made our services unique compared to other competitors					
Our members are our first concern					

**Thank you for answering the questions**