ADOPTION OF REVERSE LOGISTICS IN INFORMATION AND COMMUNICATIONS TECHNOLOGY FIRMS IN KENYA

BY

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DECLARATION

This project is my original work and has not been submitted to any other university for examination.

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

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May all whose paths I crossed - be blessed by our Creator one day.

Thank you all

DEDICATION

To my loving wife Phoebe.

Daughters Judy and Brenda.

Sons Denis and Nicolas.

Grandson Christian.

ABREVIATIONS

CAK Communications Authority of Kenya

CRM Customer Relationship Management

EoL End of Life

EoU End of Use

EPR Extended Producer Responsibility

GDP Gross Domestic Product

GOK Government of Kenya

GSCM Green Supply Chain Management

IAER International Association of Electronic Recyclers

ICT Information and Communication Technology

ISPs Internet Service Providers

IT Information Technology

RL Reverse Logistics

RLEC Reverse Logistics Executive Council

3PL Third Party Logistics Service Provider

RBV Resource Based View

SC Supply Chain

SPSS Statistical Product for Social Sciences

TCE Transaction Cost Economics

KMO Kaiser-Meyer-Olkin

ABSTRACT

Moving goods from their point of origin towards their final destination represents forward logistics while reverse logistics is the movement of products or materials in the opposite direction. The purpose of reverse logistics is to recapture the product residual value at the point of dismissal and ensure safe disposal of toxic and hazardous contents at their end of life. When discarded into the landfill, these hazardous contents are also damaging to the ecosystem. The purpose of this study was therefore to establish the extent to which reverse logistics has been adopted in the ICT sector in Kenya. The study also aimed at establishing the barriers or driving forces that determine adoption of reverse logistics in this sector in Kenya. A census survey of 40 ICT firms registered with the Communications Authority of Kenya (CAK) was designed to provide insight on extent of adoption of and barriers to reverse logistics by the ICT firms. Primary data was collected using structured questionnaires designed by the researcher. Descriptive statistics including frequency, percentages, mean and standard deviation as well as principle component analysis were used to analyse data obtained to put forward recommendations. Results showed that operators in the ICT sector have adopted reverse logistics to appreciable levels.It was therefore recommended that stakeholders put in place measures to spur adoption and implementation of reverse logistics. Such efforts could for instance begin with massive awareness creation on the relevance of reverse logistics. The Government through National Environmental Management Authority (NEMA) should enhance support for reverse logistics. This could be done through provision of attractive incentives schemes like favourable taxation systems. Another approach is for government to set up a collaborative entity or strategic alliance to run reverse logistics for a number of firms in the same industry. This collaborative approach is more effective and efficient as it reduces the investment of individual firms and enables economies of scale through centralization.

Key words: Reverse Logistics, ICT, Communication Authority of Kenya.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Moving goods from their point of origin towards their final destination represents forward logistics while reverse logistics is the movement of products or materials in the opposite direction. Producers manufacture goods then distribute them towards targeted user segments. The users take these goods and consume them until the time they are deemed no longer useful. This is End of Life state (EoL) or End of Use (EoU) state. At this stage most products still have value that can be reclaimed to add competitive advantage. For example the market for reverse logistics in the United States (US) was approximately $58 billion in 2004, comprising 0.5 percent of the US GDP (RLEC, 2007), and the reverse flow is increasing (de Brito *et al*., 2004). Resident within most electronic products are toxic and hazardous components that require careful handling.

Main activities of RL include product returns, remanufacturing, source reduction, material substitution, and waste management (Rogers & Tibben-Lembke , 1999, 2001). The purpose of reverse logistics is to recapture the product residual value at the point of dismissal and ensure safe disposal of toxic and hazardous contents at their EoL. The need to process the rapidly growing amount of EoL electronic products or e-waste has resulted in focusing increasing attention on reverse logistics. Improper handling of these e-wastes may trigger damage to human health from respiratory problems to cancer. When discarded into the landfill, these hazardous contents are also damaging to the ecosystem (Lee *et al.*, 2000).

Balancing economic and environmental performance has become increasingly important for organizations facing competitive, regulatory, and community pressures (Shultz *et al.*, 1999). With increased pressures for environmental sustainability, it is expected that enterprises will need to implement strategies to reduce the environmental impacts of their products and services (Lewis *et al.*, 2001; Sarkis, 1995). Reverse Logistics, by "closing the loop" Zhu *et al.*, (2004) improves firm's environmental sustainability.

The Information and Communications Technology (ICT) sector of Kenya currently handles millions of electrical and electronic equipment in the form of mobile phones, computers and television sets in the forward supply chain. The reverse chain handling and eventual disposal of the residual toxic and hazardous components of these electrical and electronic products is the object of this study.

1.1.1 Reverse Logistics

A reverse logistics system is a supply chain that has been redesigned to manage the back flow of products or parts destined for remanufacturing, recycling or disposal in order to effectively use resources (Dowlatshahi, 2000). Reverses logistics systems are complicated in terms of the scope involved (Fulconis *et al.*, 2007). In order to gain benefits from reverse logistics systems, there is a need to investigate the planning, implementation, and controlling the systems properly (Tan *et al.*, 2003).

Reverse logistics is a relatively new research direction in the area of supply chain management (Dowlatshahi, 2005). However, reverse logistics are generally poorly managed due to the fact

that more than one company may get involved in the reverse logistics process, and thus a holistic approach is required (Chapman *et al.*, 2005). In this connection, redesign of the existing forward and reverse logistics processes post a challenge to many companies.

Reverse logistics covers a wide range of industries. For instance, the automobile companies are quite busy dealing with the recovery of EoL and EoU –use auto parts and many vehicle recalls. Millions of ICT products that contain various hazardous materials (e.g. lead and mercury) are scrapped in US every year, and industry leaders (for example, Apple, Dell, and Sony) have voluntary take-back programs (IAER, 2006).

1.1.2 ICT Sector in Kenya

The information and communication technology (ICT) sector in Kenya is vibrant. Kenya has witnessed significant growth in the ICT sector as demonstrated by rapid rise in the number of telephone lines, Internet Service Providers (ISPs), number of internet users and, broadcasting stations. Available statistics, (CAK,2013) indicates that there were; 31.4million mobile telephone subscribers as of October 2013 representing 77% penetration. Safaricom is the dominant player with 73.2% share of the subscribers. Airtel, Telkom Kenya and Essar Yu Mobile had a market share of 14.9%, 6.9%, and 4.6% respectively. There were 21.2 million internet users in the same period with population having access to internet standing at 52.3%.

The Kenya Government recognizes the role of ICTs in the social and economic development of the nation and has promulgated a national ICT Policy based on the Economic Recovery Strategy for Wealth and Employment Creation (2003-2007) (GOK, 2002).The Communications Authority

of Kenya (CAK) is responsible for ensuring fair play in the ICT sector as defined by the Kenya Communications Act No-2 of 1998. It is the independent regulatory authority for the communications industry in Kenya to license and regulate telecommunications, radio-communication and postal/courier services in Kenya.

The ICT sector is to undergo rapid change occasioned by the envisaged provision of laptop to each and every primary school going pupil. With the current enrolment in primary school running into millions the effect of this policy is to accelerate rate of entry into the sector of computers. The disposal of this equipment within the economy will be an additional pressure for adoption of reverse logistics programs to ensure environmental sustainability.

1.2 Research Problem

ICT equipments have a relatively short product life cycle and combined with rapid technological changes and rapidly changing customer tastes and preferences the rate of ICT equipment obsolescence is very high. The overall effect of these is a rapid accumulation of equipment with toxic and hazardous substances in the environment. To what extent have the primary suppliers and retailers of ICT equipment in Kenya implemented reverse logistics? How aware is the Kenyan public on the environmental issues that come with handling of these types of goods?

Chan and Chan, (2008) study on the mobile phone industry in Hong Kong established that proper implementation of reverse logistics systems can result in better customer loyalty and reduction in operational costs due to reuse or remanufacturing of some parts. Although the findings of the paper were limited to Hong Kong mobile phone industry, it is expected that similar situation

could be identified in other industries and in other countries. Chan and Chan recommend further research to verifying whether the same findings exist in other industries or other countries.

Ismael *et al.*,(2010) exploratory study of reverse logistics initiatives in several Turkish electronics and furniture firms shows that the reverse logistics initiatives were still in a very early stage. Companies' involvement in product returns is mostly due to the legislative liabilities, and system inadequacies are emphasized as the most important reason for not being able to implement an efficient reverse logistics.

A survey of reverse logistics literature locally shows a dearth of studies on reverse logistics within the Kenyan business environment. A case study on Kenya Medical Supplies Association by Waithaka, (2012) found that reverse logistics pratices adoption was mainly as a result of need to comply with the legal directives.Further reasearch on reverse logistics adoption in manufacturing firms in Nairobi Serut, (2013) established that reverse logistics practices within manufacturing firms are still in the infancy stage. From the above there has been some research done in the electronics industry though so far none has been done within the Kenyan context to explore reverse logistics adoption within the vibrant Kenyan ICT industry.This current research aimed at establishing the state of reverse logistics adoption in ICT sector firms within Kenya.

In trying to map the reverse logistics adoption in the Kenyan ICT study focus was on two specific research questions, first to what extent have the firms in the ICT sector adopted reverse logistics and secondly what are the driving forces that determine the adoption and of reverse logistics within the ICT sector in Kenya.

1.3 Research Objectives

The purpose of this study was to:

i. Establish the extent to which reverse logistics has been adopted in the ICT sector in Kenya.
ii. Establish the driving forces that determine adoption of reverse logistics in the ICT sector in Kenya.

1.4 Value of the Study

The findings of the study are useful to the managers of firms in ICT sector as it would improve their comprehension of the opportunities that are inherent in fully embracing reverse logistics in their operations. This knowledge may form a basis for formulation of strategies that take advantage of the opportunities while greening the firm's image. The findings impacts on the decision making role of managers.

In the academia the findings of this study provides a basis for further research in reverse logistics within ICT sector in the environment of a young and non industrial economy. This will not only deepen the concept of reverse logistics as a subject but also add to the growing literature.

Further, the findings are of value to policy makers within the government circles, particularly National Environmental Management Authority (NEMA), as the report exposes the empirical situation on the ground in regard to reverse logistics within Kenya's ICT sector and consequently

be able to evaluate the threats posed by the current practices and develop a policy frame work for minimizing exposure.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter undertakes a review of available literature on the field of reverse logistics starting with the concept of reverse logistics through the theories that underpin reverse logistics. A section that discusses the importance of reverse logistics is also included before ending with forces that drive or bar implementation of reverse logistics. The chapter then concludes with a summary.

2.2 Theoretical Foundation of Reverse Logistics

Reverse logistics can be explained by the three prevailing theories namely the Resource Based View (RBV) theory of the firm, Halldo'rsson, (2007); Pandza, (2003); Rungtusanatham,*et al* (2003), the Transaction Cost Economics (TCE) theory, Maltz, (1993); Skjott-Larsen, (2000) and the Institutional theory of the firm (DiMaggio & Powell ,1983).

2.2.1 Resource Based View Theory

Resources are fundamental drivers of firm performance (Conner, 1991). Resources include all assets, capabilities, organizational processes, firm attributes, information, and knowledge controlled by a firm that enable the firm to conceive of and implement strategies (for example, reverse flow programs) that improve the firm's efficiency and effectiveness (Barney, 1991).

According to Barney, (1986) a firm is said to have competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitor.This competitive advantage is sustainable if the advantage resists erosion by

competitor behavior (Bharadwaj *et al.*, 1998).The RBV explains competitive advantage using internal reasons for superior firm performance. The RBV contention is that the possession of such key resources and their effective development and deployment provide unique synthesis of elements that allows the firm to achieve and sustain competitive advantage. Closs *et al.,* (2000) identified differences in firms' logistics competency because of differences in resource allocation. Daugherty *et al*., (2001) directly addressed resource commitment in a reverse logistics context and found resource commitment significantly influence achievement of reverse logistics program goals.

2.2.2 Transactional Cost Economics Theory

Transactional Cost Economics (TCE) theory specifies the conditions under which a firm should manage an economic exchange internally within its boundary or externally through inter-organizational arrangement or in other words through a supply chain. It focuses on minimizing the total transaction costs of producing and distributing a particular good or service. These costs are determined by limited rationality, opportunistic behavior, frequency, uncertainty, and asset specificity involved in the transactions (Williamson, 1975,1985,1996). The first two elements are assumptions that underpin the choice of a firm between in-sourcing and out-sourcing. The last three elements are factors or variables that characterize any transaction and affect the transaction cost. The theory helps determine a firm's boundary and accounts for the efficiency seeking behavior of the firm through inter-organizational arrangements governed by contracts (Baiman *et al.*, 2002; Maltz, 1993).

From a theoretical perspective, TCE explains why small firms with limited resources usually rely on outsourcing to 3PLs to implement reverse logistics in the initial stage. In this regard, the selection of reverse logistics providers is similar to that of forward logistic providers. The emphasis is on the service provider's capability of taking up the organizational role to handle EoL returns for recycling and reuse (Lau *et al.*, 2008; Meade et *al.*, 2002). RBV, on the other hand, accounts for the incorporation of reverse logistics as part of long-term company business strategies by some large corporations in order to attain sustainable competitive advantage (Clendenin, 1997; Wells *et al.*, 2005).

2.2.3 Institutional Theory

According to the Institutional theory, organizations implement business practices because doing so enhances their legitimacy (DiMaggio & Powell, 1983). According to DiMaggio & Powell (1983), once a set of organizations emerges as a field, rational actors tend to make their organizations increasingly similar. Forces within the firm and the environment encourage convergent business practices (Zsidisin *et al.*, 2005). This is isomorphism; factors leading organizations to adopt similar structures, strategies, and processes (Deephouse, 1996). It is important to recognize variants of the institutional theory exist (Scott, 1987). There are two main variants to the Institutional theory Ketokivi & Schroeder, (2004), the economic variant drawing from the work of, Haunschild & Miner (1997), and the sociological argument drawing from DiMaggio & Powell (1983). Under the sociological argument, mimickers are primarily motivated by attempts at legitimacy whereas under the economic one mimickers are economically motivated, seeking efficiency (Ketokivi & Schroeder, 2004).

A key tenet in the sociological variant of institutional theory is that organizational isomorphism increases organizational legitimacy (Deephouse, 1996). The motivation for managerial decision making is separated from the decision outcomes by the focus on legitimacy (Gopal & Gao, 2009).Legitimacy in this context, is defined as a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions (Suchman,1995). Legitimacy is viewed as a necessary condition to compete, driving organizations to adopt processes that lead to isomorphism (Gopal *et al.*, 2009). Three types of mechanisms towards institutional isomorphism have been identified DiMaggio & Powell, (1983): coercive, mimetic and normative.

Coercive isomorphism is due to both formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by expectations from the society (DiMaggio & Powell, 1983). A powerful firm can exercise a coercion to serve its own interest by demanding that partners adopt its favorable operational practices (Liu *et al*., 2010). Companies are under pressure from stakeholders, such as customers and the government, to incorporate social, environmental and economic responsibility considerations into their operations Zhu & Sarkis, (2007); Tate *et al*., (2010); Sarkis *et al*., (2011), which cause them to conform to be perceived as more legitimate (Zhu & Sarkis, 2007). Coercive pressures can lead to adaptation of practices, but institutional theorists also show this does not always lead to efficiencies (Miemczyk, 2008).

Mimetic isomorphism occurs due to uncertainty that encourages imitation (Zsidisin *et al*., 2005). The more uncertain the relationship between means and ends the greater the extent to which an

organization will model itself after organizations perceived as successful (DiMaggio *et al*., 1983). Selznick (1996) suggests mimesis is more deeply rooted in anxiety than in rational efforts to avoid reinventing the wheel. Mimetic isomorphism occurs within industry groups to maintain legitimacy by imitating successful strategies and to minimize the risk of being a first mover in a new market (Miemczyk, 2008). Benchmarking is a typical approach related to mimetic pressures (Liu *et al*., 2010).However, best practices do not work in all organizations due to contextual mismatches Sousa & Voss, (2008), and imitation can lead to suboptimal results.

The third form of pressure is normative isomorphism (DiMaggio *et al*., 1983).Normative forces come from professionalization, defined as a move by members of an occupation to define the conditions and methods of their work to establish greater legitimacy for their occupation (Gopal *et al*., 2009). If many employees have similar educational backgrounds and industry experiences, they tend to define problems and filter information similarly (DiMaggio *et al*., 1983), creating homogeneity over time (St John *et al*., 2001).

2.3 Reverse Logistics in Organizations

In the general business environment, the flow of forward logistics is the sending of the semi-final or final products from the point of origin to the point of consumption, with the participation of several key supply chain partners, namely the supplier, manufacturer, distributor, wholesaler, and retailer or forwarder (Zelbst *et al*., 2009). Reverse logistics has been defined as the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal (Rogers *et al*., 1999).

Reverse Logistics is a green supply chain management practice (Rogers & Tibben-Lembke 2001).

Business organizations have begun to implement green supply chain management (GSCM) practices in response to customer demand for products and services that are environmentally sustainable and that are created through environmentally sustainable processes and in response to governmental environmental regulations (Murray, 2000; Green *et al*., 2008). These practices require that manufacturers work in concert with suppliers and customers to enhance environmental sustainability. The implementation of GSCM practices is expected to result in improved environmental performance as measured by reductions in air emissions, effluent waste, solid waste, and the consumption of toxic materials (Closs *et al*., 2011).

Depending on size, internal constraints, and other considerations, different companies may adopt different attitudes towards reverse logistics. For firms taking a reactive approach, reverse logistics is implemented mainly to comply with legislations. The activity is considered as a cost function and the objective is to run it at the lowest cost. For firms taking a proactive approach, reverse logistics forms part of the company's long-term strategy to gain competitive advantage over its competitors. The activity is seen as a unique capability that adds value to the product.

2.4 Importance of Reverse Logistics

End-of-life (EoL) products, especially Waste of Electrical and Electronic Equipments (WEEEs), contain pollutants which are toxic and hazardous to human health. Improper handling of these e-wastes may trigger damage to human health. This issue has raised awareness in the society about

the environment. This awareness became vivid by the enactment of various environmental laws around the world, such as the WEEE Directive by the European Union (2003), the Household Appliances Recycling Law by the Japanese Ministry of Environment (2000) and Extended Producer's Responsibility Act by New South Wales government in Australia (2001).These facts triggered focus on reverse logistics.

Within the reserve logistics domain, the product returns process has emerged as a key element that can influence the customers' purchase decisions and thus, an effective product returns process is viewed as a competitive advantage (Stock *et al.*, 2006).Today's cash strapped customer is extremely risk averse and in response to this reality, some retailers view relatively liberal returns policies as critical to retaining consumers. Furthermore, with the increase of online purchases, many customers are concerned with how an online purchase will translate into a store return, if necessary. The results of a survey by Harris Interactive (2008) reported that:" 92% of customers are somewhat or very likely to shop again if the returns process is convenient on the other hand, 82% are not likely or not very likely at all to shop again if the returns process is inconvenient" (Mermelstein, 2006)

Perhaps one of the oldest concepts in the management of reverse logistics is the product life cycle. Determining the forms and phases of the product life cycle will enable companies to prepare better their market strategy for their products. Not only does the product life cycle break down the cycle of the product, but also it determines the necessary steps that need to be addressed once an item is returned. These concepts and their operational management are

essential components in defining customer service through customer relationship management (CRM) principles (Anton *et al.*, 2002).

Many decisions are made during the development phase of a product that will have lasting effects on the product's life through its implications of reverse logistics. During the development phase, designing a product so that the customer can easily and intuitively figure out how to use it will help reduce the number of non-defective items (Smith, A.D., 2002; Tibben-Lembke, 2002). Reverse logistics programs can aid a company in finding problem areas and patterns of defects, thus creating a way to minimize the amount of returns a company receives.

Reverse logistics has great potential to improve the financial performance of organizations (Doherty, 1996). Reverse flows can be very costly if not managed well (de Brito, 2003). The benefits a company can gain from reverse flows are twofold – direct and indirect (de Brito & Dekker, 2002). The direct (financial) benefits consist of income from re-sold products, money saved on spare parts or source reduction when they are substituted for by de-manufactured modules and re-use of recycled materials. The in-direct benefit comes from improved corporate image due to recycling of wastes.

Balancing economic and environmental performance has become increasingly important for organizations facing competitive, regulatory, and community pressures (Shultz *et al.*, 1999). With increased pressures for environmental sustainability, it is expected that enterprises will need to implement strategies to reduce the environmental impacts of their products and services (Lewis *et al.*, 2001; Sarkis, 1995). To establish their environmental image, enterprises have to re-

examine the purpose of their business (Hick, 2000). Success in addressing environmental items may provide new opportunities for competition, and new ways to add value to core business programs (Hansmann *et al*, 2001). Reverse logistics ensure environmental sustainability through green supply chain practices.

2.5 Drivers and Barriers to Reverse Logistics

Reverse logistics is driven by factors such as environmental legislations Nnorom & Osibanjo, (2008), extended producer responsibility (EPR) (Khetriwal *et al.*, (2009); Lee *et al*., (2000), economics Li , *et al.*, (2008), and improved customer service requirements (Wu & Cheng, 2006). Owing to increased public concern about the environment, most developed countries have made legislations mandating manufacturers and importers to take back used ICT products at the end of their useful lives. The returned products may then be refurbished or remanufactured to extend their periods of usage or recycled to recapture value (de Brito & Dekker, 2002; Chen, 2001; Srivastava & Srivastava, 2006; Tang & Naim, 2004).

In green supply chain management, a good strategy enables business to rescue and recover many parts and components from used products through reverse logistics activities of remanufacturing and reuse (Beamon, 1999; Kaebernick *et al.*, 2005). Closed-loop supply chains comprising forward and reverse logistics can be combined to achieve more sustainable production and consumption (Wells & Seitz, 2005). An efficient and effective reverse logistics management strategy has become a crucial weapon for a firm to defeat its rivals in the same industry (Deshmukh *et al.,* 2006). Logistics performance, forward and reverse alike, is positively impacted by a firm's supply chain management strategy. The two together positively affect

marketing performance which, in turn, positively impacts financial performance of a firm (Green *et al.*, 2008). There are also many barriers to reverse logistics.

Rogers *et al., (*1999) in their research indentified a number of barriers that make practicing reverse logistics difficult. The presence or absence of these factors can become drivers or barriers to reverse logistics adoption and implementation in a particular industry. These factors range from external ones such as public awareness, legislations, and support of supply chain partners to internal considerations such as importance of reverse logistics relative to other issues, company policies, strategic planning, top management commitment, resistance to change, information and technological systems, financial resources, personnel resources, performance metrics, and quality of returned products.

Misconception, lack of management attention and company policies, absence of standardized processes an inadequate information flow infrastructure and technologies, shortage of personnel and financial resources, and concerns about competitive and legal issues, are among the common obstacles (Rogers *et al.*, 1999). Further, reverse logistics are poorly managed in general because more than one company is usually involved in the process. A holistic approach is therefore required which demands close collaboration among parties and perhaps a redesign of the existing forward logistics processes to form a closed-loop (Chapman & Corso, 2005).

In their review of quantitative models for reverse logistics, Fleischmann *et al.,* (1997) list out the differences between forward and reverse logistics networks which also constitute some of the barriers to reverse logistics particularly in network planning. These include requirement of a

convergent structure of network from many sources to a few demand points, high degree of uncertainty in supply both in terms of quantity and quality of used products returned by customers, and uncertain end markets for recovered products. The uncertain timing and quality of returns, the need to balance returns with demands, and the uncertainty in materials recovered from returned items are also some of the complicating characteristics impacting production planning and control for remanufacturing (Guide, 2000; Guide *et al*., 2003).Depending on the ability to overcome these barriers, some firms are able to implement reverse logistics using internal self support system, e.g. Hewlett-Packard, whereas others resort to outsourcing to third-party logistics (3PL) providers to handle consumer or EoL returns and recycling, e.g. 3M (He & Wang, 2005).

The outsourcing approach permits a firm to focus on its core activities as well as to achieve more flexible reverse logistics operations and to transfer risk to third party. However, selection and management of 3PL providers can be difficult. Another approach, which is usually initiated by industry association or government, is to set up a collaborative entity or strategic alliance to run reverse logistics for a number of firms in the same industry (He & Ji, 2006). This collaborative approach is more effective and efficient as it reduces the investment of individual firms and enables economies of scale through centralization.

2.6 Summary

The growing concern for the environment, coupled with rapid increase in the introduction and use of new technology in the marketplace, has led to increased interest and focus in reverse logistics (Blumberg, 2005). Andel, (1997) suggested that “reverse”, if strategically managed,

can provide a competitive advantage by consolidating the market position with the overall benefit of improving company image. Because of all the uncertainties involved, the process of reverse logistics program development and implementation is very complex (Kearney, 2004).

Chan and Chan, (2008) study on the mobile phone industry in Hong Kong established that proper implementation of reverse logistics systems can result in better customer loyalty and reduction in operational costs due to reuse or remanufacturing of some parts. Although the findings of the paper were limited to Hong Kong mobile phone industry, it is expected that similar situation could be identified in other industries and in other countries .Chan and Chan recommends further research to verifying whether the same findings exist in other industries or other countries.

Ismael *et al.*,(2010) exploratory study of reverse logistics initiatives in several Turkish electronics and furniture firms shows that the reverse logistics initiatives were still in a very early stage. Companies' involvement in product returns is mostly due to the legislative liabilities, and system inadequacies are emphasized as the most important reason for not being able to implement an efficient reverse logistics.

Locally, a case study on Kenya Medical Supplies Association by Waithaka, (2012) found that reverse logistics adoption was mainly as a result of need to comply with the legislative directives.Further reasearch on reverse logistics adoption in manufacturing firms in Nairobi Serut, (2013) established that reverse logistics practices within manufacturing firms are still in the infancy stage. From the above there has been research done in the electronics industry however so far none has been done and published within the Kenyan context to explore reverse

logistics adoption within the vibrant Kenyan ICT industry. Therefore, this paper aims to fill this gap and to disseminate the information gathered on adoption to industrial companies, academia and decision makers in general.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research plan or methodology. This is followed by an explanation of the study population and sampling design to capture information as set out in the research objectives. Then a description of research instruments to be applied is outlined followed by,,data collection procedures and the method of data analysis.

3.2 Research Design

This was a cross sectional survey research regarding reverse logistics adoption within ICT firms in Kenya. According to Cooper & Schindler (2006) in a cross sectional design, either the entire population or a subset thereof is selected, and from these individuals, data are collected to help answer research questions of interest. The information about the variables that is gathered represents what is going on at only one point in time.

3.3 Population of the Study

The study population consisted of 40 registered ICT firms as per the list provided by the Communications Authority of Kenya (CAK, 2013). This study was a census. The bulk of these companies are located within the city of Nairobi.

3.4 Data Collection

The responses of the members of this population were captured through the research instrument for data collection designed by the researcher. The instrument was administered by the

researcher and his assistant. In this current study primary data was captured that relates to the adoption of reverse logistics and the drivers and barriers to the adoption in ICT firms in Kenya. The questionnaires were designed or structured to meet the objectives of the current study.

A five point likert scale was adopted in the scale questionnaire. The instrument sought response on the questions that were grouped into three (3) sections. Section (i) sought demographic and general information, section (ii), sought to isolate the extent of adoption and the drivers of reverse logistics of the company, section (iii) sought responses relating to barriers to the adoption of reverse logistics.

3.5 Data Analysis

Once the data was received from the respondents it was checked for completeness and correctness then coded in preparation for processing with the statistical quantitative analysis methods. Descriptive statistics, the discipline of quantitatively describing the main features of a collection of data was applied in the analysis to calculate the mean and standard deviation for each element or likert item.

The coded data was then analyzed using Statistical Product and Service Solution (SPSS) to generate, frequency, percentage, mean and standard deviation for, discussion and interpretation. Principle component analysis was used to isolate barriers from drivers of reverse logistics adoption in the ICT industry.

CHAPTER FOUR

RESULTS, DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents an analysis of data collected and discusses the study findings. Data analysis and report of findings was done using descriptive statistics in the form of frequencies tables, percentages, mean and standard deviation. Principal component analysis was used for separating barriers from drivers of reverse logistics.

4.2 Demographic Characteristics of the Respondents

The study population comprised 40 respondents out of which 35 responded giving a response rate of 87.5%. The respondents were senior managers in charge of logistics or supply chain within the ICT companies. The findings on their demographics is summarised in Table 4.1.

Table 4.1 Respondents Demographic Characteristics.

Respondents Population Based on:	Frequency	Percentage
Gender: Males	29	82.9
Female	6	17.1
Total	35	100.0
Age: 25-30	10	28.6
31-35	14	40.0
36-40	5	14.3
41-45	6	17.1
Total	35	100.0
Length of service yrs: Less than 1	5	14.3
1-5	13	37.1
6-10	14	40.0
Above 10	3	8.6
Total	35	100.0
Core company business: Importer	6	17.1
Wholesaler	9	25.7
Retailer	20	57.1
Total	35	100.0

Data contained in Table 4.1 shows that the respondents included 29 (82.9%) males and 6 (17.1%) females showing that the ratio of males to females in the senior management positions in the ICT sector is 4 to 1 a condition of gender bias in either employment or promotion of staff. It was also indicated that a majority of the respondents 14 (40 %) were in the 31-35 years age bracket representing a relatively young though experienced individuals also referred to as the Y-generation who are techno savvy. Similarly, 17 (48.6%) of the respondents indicated that they had served in their respective positions for more than 5 years while another 13 (37.1%) had served for between 1 and 5 years. This means that a majority of the respondents had worked in their respective firms long enough to enable them provide credible information on their firms adoption of RL practices.

Relative to the ICT companies' profile, 6 (17.1%) indicated that their core business was import of ICT product and services, 9 (25.7%) said they were mainly wholesalers while the remaining 20 (57.1%) indicated to be mainly retailers.

Similarly, with regard to length of operation, 19 (54.3%) of the ICT firms were said to have commenced operation before 2000, 7 (20.0%) between 2000 and 2005 and the remaining 9 (25.7%) between 2006 and 2008. This means that almost all the firms involved in ICT operations project survey have been in the business more than 5 years a period considered long enough to have adopted and tested various ICT business practices including reverse logistics practices. However, only 16 (45.7%) of the practitioners acknowledged measuring reverse logistics cost within their firms. On the one hand, a majority of the operators who acknowledged not measuring the reverse logistics costs gave as their reason the prospect of saving money in the process, that the practice is negative and the fact that the cost could be estimated.

On the other hand, those who insisted that they measured reverse logistics costs gave the most measured cost element as transport cost, and wages of particular workers. Other measured elements included materials used in repair operations and external failure/customer compensation costs.

4.3 Extent of Adoption of Reverse Logistics System

Fourteen items were used to measure the respondent's perception of the extent of adoption of drivers of reverse logistics system. Their responses were as is shown in Table 4.2.

Table 4.2 Extent of Adoption of Reverse Logistics Systems

Statement	Great Extent %	Mean	SD	Rank
The company has a well-established supply chain	91.4	4.5439	0.65722	1
The Company has incorporated RL practices in SC	71.4	3.4286	1.19523	8
RL is included in the Company Strategic Plans	68.5	3.3714	1.39507	9
Related equipment, facilities and infrastructure adequate	74.3	4.0000	0.72761	2
Support from the investors and shareholders is adequate	62.8	3.9429	0.83817	3
Accurate cost records of RL activities exist	60.0	3.5714	1.39928	6
RL activities are monitored have clear KPI measures.	45.8	3.2571	1.37932	11
Public awareness of effects of e-waste on environment	31.4	3.0286	1.46500	14
Legislation regulating e-waste disposal	34.3	3.1429	1.37505	12
Support from Supply Chain partners	74.3	3.8000	1.23193	4
RL is important relative to other Company issues	57.2	3.3429	1.34914	10
Company policy supports RL	57.1	3.5143	1.50238	7
RL is included in the Company strategic plans	51.5	3.1286	1.31699	13
Top management is committed to RL	65.7	3.7429	1.26823	5
Grand Mean		3.5583	1.22147	

From Table 4.2 which contains the results of an analysis of the extent of adoption of reverse logistics systems shows that the respondents' perception of the ICT firms' adoption of the reverse logistics is fair given its weighted mean of 3.5583. The respondents were certain that their companies have well-established supply chain given its mean of 4.5439, they insisted that their firms' related equipment, facilities and infrastructure were adequate given its mean of 4.0000, that the support from the firms' investors and shareholders is adequate given its mean of 3.9429 and that there is adequate support from Supply Chain partners given its mean of 3.8000.

Likewise, respondents asserted that the firms' top management are committed to reverse logistics (mean of 3.7429), that accurate cost records of reverse logistics activities exist (mean of 3.5714), that their companies' policy supports reverse logistics (mean of 3.5413) and that their company had incorporated reverse logistics activities in SC (mean of 3.4286). Additionally, the respondents were sure that reverse logistics is included in the Company Strategic Plans given its mean of 3.3714, that reverse logistics is important relative to other Company issues (mean of 3.3429), that reverse logistics activities are monitored have clear KPI measures (mean 3.2571) and that legislation regulating e-waste disposal (mean of 3.1429). Lastly, respondents confirmed that reverse logistics is included in their Companies' strategic plans (3.1286) and that there is Public awareness of effects of e-waste on environment (mean of 3.0286).

4.4 Barriers and Drivers to Reverse Logistics Adoption

The second objective of the study was to identify significant barriers and drivers of reverse logistics adoption among investors in the ICT industry in Kenya. An inquiry on reverse logistics adoption was made using 14 likert scaled statements. Principal component analysis was then used to isolate the most significant reverse logistics factors considered as barrier from those considered as drivers. The results were as is contained in Tables 4.3 and 4.4.

Table 4.3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.689
Bartlett's Test of Sphericity	Approx. Chi-Square	1085.970
	df	35
	Sig.	.000

Table 4.3 which contain the results of KMO and Bartlett's test on the elements show that the correlation (0.689) for the elements was barely adequate for factor analysis. Nonetheless,

principal component analysis was carried out on the elements and the table on the results of their communalities showed that none of the elements had particularly very low extraction communalities to warrant removal. Thus further process of analysis was carried out and five components with eigenvalues of 1 or more accounting for about 72% of the total variance were extracted and rotated as is illustrated by the scree plot Figure 4.1.

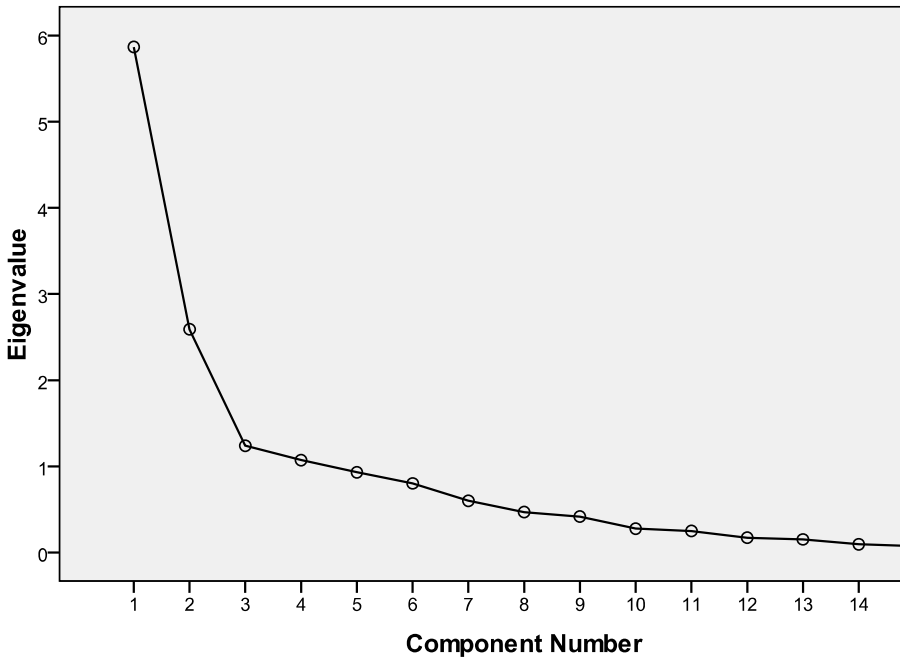

Figure 4.1 Scree Plot.

The process of isolation of barriers from drivers of reverse logistics adoption practices among investors in ICT industry in Kenya was determined based on values of correlations between variables and their components in the unrotated component matrix summarized in Table 4.4.

Table 4.4: Component Matrix

	Component				
	1	2	3	4	5
Lack of Information and technology infrastructure is a barrier to adoption of RL	.650	-.169	-.220	.438	-.376
Lack of adequate Financial resources is a barrier to adoption of RL	.733	.063	-.080	.011	.545
Lack of adequate Human capital is a barrier to adoption of RL	.758	.213	-.093	-.028	.557
Lack of RL performance metrics is a barrier to adoption of RL	.427	.310	-.511	.577	-.280
Lack of Government incentives is a barrier to adoption of RL	.520	-.403	-.423	-.101	-.136
Quality of returned products is a barrier to adoption of RL	.470	.708	-.145	-.043	.295
Lack of collaboration between SC partners is a barrier to adoption of RL	.619	.401	.501	.043	-.256
Company size is a barrier to adoption of RL	.691	.267	.361	-.140	-.093
High Volume of reverse flow in the industry is a barrier to adoption of RL	.393	.071	.395	-.668	-.318
Resources devoted to RL activities are barrier to adoption of RL	-.101	-.798	.135	.087	.361
Appropriate Government incentives is a barrier to adoption of RL	.267	-.461	.645	.351	.147
Huge Consumer pressure is a barrier to adoption of RL	-.644	.421	.289	.443	.160
Public environmental awareness is a barrier to adoption of RL	-.707	.581	.259	.135	.044
Availability of collaborative business partners are barrier to adoption of RL	-.464	.194	-.592	-.393	.101

Extraction Method: Principal Component Analysis.

Table 4.4 which contains the values of the correlations between variables and their components in the unrotated component matrix shows that there are five elements with correlation values greater than 0.6000 thus constitutes the list of extracted elements. Further scrutiny shows that four elements have negative correlation values. Using a one dimension extraction method of

principal component analysis, elements with positive correlation values which were found to be ten in number which were correlated were retained while those with negative correlation values were excluded.

Thus the table shows that there exist barriers and drivers of reverse logistics adoption among players in ICT industry in Kenya. The principal indicators of reverse logistics factors isolated include lack of adequate Human capital for adoption of reverse logistics, lack of adequate financial resources and company size in adoption of reverse logistics. Other notable ones include lack of Information and Technology infrastructure and lack of collaboration between SC partners in adoption of reverse logistics practices in decreasing order of effect. These predominant factors were notably selected by the respondents as barriers to adoption of reverse logistics among players in the ICT sector in Kenya.

The remaining set of elements including appropriate Government incentives, quality of returned products, reverse logistics performance metrics, volume of reverse flow in the industry and resources devoted to reverse logistics activities were suggested to be drivers to reverse logistics adoption.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter is a summary of the research findings, conclusions, recommendation and suggestion for further research. The main purpose of this study was to determine the extent of adoption of reverse logistics by firms involved in information technology related businesses**.** Data for analysis was obtained by use of questionnaires designed by the researcher for the ICT firms' managers in charge of their company's logistical issues. Information obtained was analyzed quantitatively with the aid of statistical package for social sciences (SPSS) version 20 computer software.

5.2 Summary of Findings

In pursuance of the purpose of the study to establish to which extent RL has been adopted in ICT sector and what driving forces influence the adoption in this sector in Kenya, questionnaires based on these objectives were designed then administered to the respondents and information analysed to establish the findings below.

The study comprised 35 senior managers in charge of Supply Chain or Logistics within various ICT companies, majority of who were males in the 31-35 years age bracket. The ICT companies' profile, indicated that the investors in the ICT value chain consisted of importers, wholesalers and retailers in increasing magnitude with almost all the companies having been in operation prior to 2008 thus showing that a majority of them have been in the business long enough to have

mastered reverse logistics systems. However, only a minority of the practitioners acknowledged measuring reverse logistics cost within their firms.

Fourteen items were used to establish the respondent's perception of the extent of adoption of reverse logistics systems. Respondents' perception of the ICT firms' adoption of the reverse logistics is fair given its weighted mean of 3.5583 with companies having well-established supply chain scoring the highest mean rating as an indicator of extent of adoption of reverse logistics systems while public awareness of effects of e-waste on environment with the lowest mean rating seemed to be the least prominent indicator of extent of adoption of reverse logistics systems.

Principal component analysis was used to isolate the most significant reverse logistics factors considered as barrier from those considered as drivers. Out of the initial fourteen statements analysed using principle component analysis, four were found to be inadequately correlated with the other factors and thus were deleted. From the remaining ten elements, a set of five each were found to be averagely or relatively strongly correlated as factor of adoption of reverse logistics practices thus were adopted as either barriers or drivers of adoption of reverse logistics practices.

The barriers of adoption of reverse logistics practices identified include lack of adequate Human capital, lack of adequate financial resources, company size, lack of Information and Technology infrastructure and lack of collaboration between SC partners. Similarly, the drivers of the process of adoption of reverse logistics practices identified include appropriate Government incentives,

quality of returned products, reverse logistics performance metrics, volume of reverse flow in the industry and resources devoted to reverse logistics activities.

5.3 Conclusion of the study

The results of the analysis of the extent of adoption of reverse logistics systems established that the ICT firms' adoption of the reverse logistics is fair given its weighted mean of 3.5583.This is consistent with the firm's attempt at enhancing resource utilization to improve efficiency and effectiveness through implementation of reverse logistics (Barney, 1991).

From the foregoing summary, it can be concluded that many of operators in the ICT sector have adopted reverse logistics to appreciable levels due to its significance for their operations given its fairly above average rating by the respondents. This is consistent with the earlier findings that reverse logistics has become a managerial priority because of the assets/value involved and the potential impact on customer relations (Daugherty *et al*., 2005).Customers expect their vendors to be willing and able to handle returns (Daugherty *et al*., 2003) When worn out or obsolete products are remanufactured, "it's not uncommon for companies to realize higher margins on these remanufactured products than they do on new items" (Stock *et al*., 2002, p. 16).

The findings established several factors which the respondents categorized either as barriers or drivers. This is confirmed by the study by Rogers *et al.,* (1999) which indentified a number of barriers that make practicing reverse logistics difficult. The presence or absence of these factors can become drivers or barriers to reverse logistics adoption and implementation in a particular industry. These factors range from external ones such as public awareness, legislations, and

support of supply chain partners to internal considerations such as importance of reverse logistics relative to other issues, company policies, strategic planning, top management commitment, resistance to change, information and technological systems, financial resources, personnel resources, performance metrics, and quality of returned products.

It was established that, only a slight minority of the practitioners acknowledged measuring reverse logistics cost within their firms. This finding is consistent with reverse logistics initiatives in developing countries. Ismael *et al.*,(2010) exploratory study of reverse logistics initiatives in several Turkish electronics and furniture firms shows that the reverse logistics initiatives were still in a very early stage. Companies' involvement in product returns is mostly due to the legislative liabilities, and system inadequacies are emphasized as the most important reason for not being able to implement an efficient reverse logistics.

5.4 Recommendations

The findings showed that the adoption of reverse logistics by ICT firms were still in nascent stage. Stakeholders should therefore put in place measures meant to spur its adoption. Such efforts could for instance begin with massive awareness creation on the relevance of reverse logistics systems through sensitization of all stakeholders. This would not only encourage adoption of reverse logistics but even ensure that all stakeholders measure the costs factors for adoption of reverse logistics ,a fact that is currently ignored by a majority of the operators.

The Government through NEMA should enhance support for reverse logistics. Government financial support and policies are important to companies in implementing reverse logistics.

Lack of enforceable environmental legislations established by the Government may lower the motivation for the organization to consider implementing reverse logistics (Nnorom & Osibanjo, 2008). Besides, tax policies and economic support from the government are also essential.. Rogers and Tibben-Lembke (1999) listed some of the legislations and regulations done by Europe and the US that paved the way for reverse logistics implementation. This could be done through provision of attractive incentives in terms of favorable taxation system and development and enactment of favorable reverse logistics adoption policies.

Lastly, the investors in ICT sector should, own their part form a lobby to enable them have a stronger negotiating ground with other stakeholders. This is coercive isomorphism. It will bring both formal and informal pressures to be exerted on organizations by other organizations upon which they are dependent and by expectations from the society (DiMaggio *et al*., 1983). Companies are under pressure from stakeholders, such as customers and the government, to incorporate social, environmental and economic responsibility considerations into their operations Zhu & Sarkis, (2007); Tate *et al*., (2010); Sarkis *et al*., (2011), which cause them to conform to be perceived as more legitimate (Zhu *et al*., 2007). Coercive pressures can lead to adaptation of reverse logistics.

Another approach, which is can be initiated by industry association or government, is to set up a collaborative entity or strategic alliance to run reverse logistics for a number of firms in the same industry (He & Ji, 2006). This collaborative approach is more effective and efficient as it reduces the investment of individual firms and enables economies of scale through centralization.

5.5 Suggestions for Further Research

The current study covered 40 ICT firms in a cross section survey. Due to complexity involved in RL issues it is suggested that a case study would be appropriate. This could be done on some of the well established financially stable ICT firms in order to really come up with practical dynamics in this sector for the purpose of bench marking.

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APPENDICES

APPENDIX 1 : Questionnaire

Section I : Demographic and General Information

1. Please indicate your gender

   i) Male [ ] ii)Female [ ]

2. Please indicate your age category

   Below 25years [ ] 26-30years [ ] 31-35 years [ ]

   36- 40years [ ] 41-45 years [ ] 46years and above [ ]

3. Which Company do you work for ----------

4. What position do you hold in this Company ----------

5. How long have you been with the company----------

6. When did your Company commence operations----------

7. What is the core business of your company. Please tick mark the appropriate box

   i) Importer [ ] ii) Distributor [ ] iii) Wholesaler [ ] iv) Retailer [ ]

   Do you measure Reverse Logistics costs

   i) Yes [ ] ii) No [ ]

8. If the answer to the above is NO kindly tick in the appropriate box the closest answer

   i) To save money. [ ]

   ii) Do not see any benefit measuring. [ ]

   iii) It is a negative item... [ ]

   iv) Costs are estimated. [ ]

9. If the answer to question 8 above is Yes, please indicate the most measured cost element

   i) Transportation Costs. [ ]

   ii) Wages of particular workers. [ ]

   iii) Costs of wastes [ ]

Materials used in repair operations [ ]

Costs of remanufacturing and repair. [ ]

Costs of packaging. [ ]

External failure/customer compensation costs. [ ]

Costs of warehousing of warranty products. [ ]

Section II: Extent of adoption of Reverse Logistics System

Please tick mark the appropriate box that best corresponds to your feeling for each statement.

Use the key 1-5 for all sections as outlined in the questionnaire where:

1) Strongly disagree 3) Neutral

2) Moderately disagree 4) moderately agree 5) strongly agree

S/NO	VARIABLES	1	2	3	4	5
1	The company has a well established supply chain					
2	The Company has incorporated RL practices in SC					
3	RL is included in the Company Strategic Plans					
4	Related equipment, facilities and infrastructure adequate					
5	Support from the investors and shareholders is adequate					
6	Accurate cost records of RL activities exist					
7	RL activities are monitored have clear KPI measures.					
8	Public awareness of effects of e-waste on environment					
9	Legislation regulating e-waste disposal					
10	Support from Supply Chain partners					
11	RL is important relative to other Company issues					
12	Company policy supports RL					
13	RL is included in the Company strategic plans					
14	Top management is committed to RL					

Section III: Barriers and Drivers of Reverse Logistics adoption

Please tick mark the appropriate box that best corresponds to your feeling for each statement.

Use the key 1-5 for all sections as outlined in the questionnaire below where:

1) Is strongly disagree 3) Neutral
2) Moderately disagree 4) Moderately agree 5) Strongly agree

S/NO	VARIABLES	1	2	3	4	5
1	Lack of Information and technology infrastructure is a barrier to adoption of RL					
2	Lack of adequate Financial resources is a barrier to adoption of RL					
3	Lack of adequate Human capital is a barrier to adoption of RL					
4	Lack of RL performance metrics is a barrier to adoption of RL					
5	Lack of Government incentives is a barrier to adoption of RL					
6	Quality of returned products is a barrier to adoption of RL					
7	Lack of collaboration between SC partners is a barrier to adoption of RL					
8	Company size important is a barrier to adoption of RL					
9	High Volume of reverse flow in the industry is a barrier to adoption of RL					
10	Resources devoted to RL activities are barriers to adoption of RL					
11	Appropriate Government incentives is a barrier to adoption of RL					
12	Huge Consumer pressure is a barrier to adoption of RL					
13	Public environmental awareness is a barrier to adoption of RL					
14	Availability of collaborative business partners are barriers to adoption of RL					

APPENDIX II: List of ICT firms .

1. Software Technologies
2. A to Z Technology Solutions
3. Micro skills Information Technologies Ltd
4. Peak and Dale Solutions
5. Insync Solutions Ltd
6. Oniv Computer Services Ltd
7. LanTech (Africa) Ltd
8. NCR (Kenya) Ltd
9. Callkey (EA) Ltd
10. Mitsumi Computer Garage Ltd
11. Datachip Ltd
12. Technology today.
13. The Copycat Ltd
14. C Hear (Kenya) Ltd
15. Office Mart
16. Microsoft Kenya
17. Skyweb Tech Ltd
18. IBM Kenya
19. Software Dynamics Ltd
20. Isat Africa Ltd
21. Crimpson Techniques
22. Nokia Solutions and Networks
23. Total Office Solutions
24. Jamii Telecommunications Ltd
25. MTN Business
26. Acess Kenya Ltd
27. Flex Communications Ltd
28. Webrunner Ltd
29. Nairobi Net (K) Ltd
30. Iway Africa
31. Pwani Telecoms Ltd
32. Softlink Otions
33. Technology Associates
34. Novel Technologies Ltd
35. My ISP
36. Smartlink Link Technologies
37. Symphony
38. IFIKA Systems Ltd
39. Virtualsat Ltd
40. YOU IT

Source : CAK (2013)

APPENDIX III: Letter of Introduction.

ODHIAMBO JECTON KIBERENGE

Tel 0724-631-651

P.O BOX 88669-80100 MOMBASA

UNIVERSITY OF NAIROBI

SCHOOL OF BUSINESS

MOMBASA CAMPUS

THE CHIEF EXECUTIVE OFFICER

SUBJECT: **REQUEST TO UNDERTAKE RESEARCH AT YOUR FIRM**

I am writing to request permission to conduct a research study at your institution. I am currently enrolled in the School of Business at the University of Nairobi, and am in the process of writing my Master of Business Administration (MBA) Research Project. The study is titled "ADOPTION OF REVERSE LOGISTICS IN ICT FIRMS IN KENYA". With your permission, I hope to undertake the project in the course of the month of September. Data will be collected through questionnaires and interviews with your senior supply chain managers. The research is aiming at examining the extent of adoption of Reverse Logistics within ICT firms in Kenya. Its objective is to establish to what extent reverse logistics has been adopted within this sector, to identify the drivers and barriers that firms face in the adoption of Reverse Logistics in this sector and establish any challenges thereof.

The information that you will give in the course of this survey will be kept confidential, and shall be strictly used for academic purposes only. We thank you in advance for your permission.

Yours Obediently

O J KIBERENGE (STUDENT)

MR. JOB MWANYOTA (PROJECT SUPERVISOR)