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DETERMINANTS OF ADOPTION OF REVERSE LOGISTICS IN MANUFACTURING FIRMS IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

The purpose of the study was to examine the determinants of adopting reverse logistics in manufacturing firms in Nairobi City County, Kenya. The study adopted a descriptive research design, with a population of 400 manufacturing firms in Nairobi City County, Kenya; a questionnaire with both open ended and closed questions was used to collect raw data from a sample of 246 respondents. The simple random was carried out and primary data was through the use of questionnaires. The secondary data was obtained from published documents. The data was analyzed with the help of SPSS. It was notable that there existed a relationship between independent variables and dependent variable. The coefficient of determination is between zero and one. The variables were very significant and they therefore needed to be considered in an effort to boost adoption of reverse logistics in the manufacturing firms. This called for manufacturing firms to try and balance resource allocation and even allocate more funds to procurement departments. There was need to enact more stringent government regulations in order to streamline procurement process that would uniformly apply to all manufacturing firms to adopt reverse logistics.

Keywords: *Organization Resources, Organization Culture, Reverse Logistics, Manufacturing Firms in Kenya*

INTRODUCTION

Increasing focus on global expansion in the marketplace has fostered greater attention on streamlining the supply chain management functions of business. The issue of sustainability in supply chain management is gaining attention in both academic literature and industry practice as an area of opportunity. Companies across geographical and industry boundaries are implementing sustainability initiatives in the supply chain in response to pressures from customers, regions of operation, investors and even employees (Melnyk, Davis, Speakman & Sandor, 2010). Organizations all over the world are responding to pressures on packaging, waste reduction and other environmental issues of Green Supply Chain Management, despite challenges which they face in its implementation. Supply chain sustainability is increasingly recognized as a key component of corporate responsibility that demonstrates an organization's commitment to considering and minimizing the environmental consequences of its activities (Zhu & Sarkis, 2006). Supply chain sustainability is the management of environmental, social and economic impacts, and the encouragement of good governance practices, throughout the lifecycles of products and services. The objective of supply chain sustainability is to create, protect and grow long-term environmental, social and economic value for all stakeholders involved in bringing products and services to market (United Nations, 2010). Managing the social, environmental and economic impacts of supply chains, and combating environmental damage, improve company reputation to the customers (Zhu, Sarkis & Lai, 2007). Logistics is an important component of supply chain management (Stank et al., 2005). The Council of Supply Chain Management Professionals (2007) defines logistics management as that part of Supply Chain Management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements. Both Stank et al. (2002) and Lin (2006) describe the importance of integrating the logistics processes of all supply chain partners to better serve the needs of ultimate customers. In recent years there has been increasing concern about the environmental effects on the planet of human activity and current logistic practices may not be sustainable in the long term. Many organizations and businesses are starting to measure their carbon footprints so that the environmental impact of their activities can be monitored. Governments are considering targets for reduced emissions and other environmental measures. There is therefore increasing interest in green logistics from companies and governments (Sbihi & Eglese, 2010). Reverse logistics is the process of retrieving the product from the end consumer for the purposes of capturing value or proper disposal (Ho, Shalishali, Tseng & Ang, 2009). Activities include collection, combined inspection/selection/sorting, re-processing/direct recovery, redistribution, and disposal. Reverse logistics is concerned with producing and distributing goods in a sustainable way, taking account of environmental and social factors. Thus the objectives are not only concerned with the economic impact of logistics policies on the organization carrying them out, but also with the wider effects on society, such as the effects of pollution on the environment. Reverse logistics activities include measuring the environmental impact of different distribution strategies, reducing the energy usage in logistics activities, reducing waste and managing its treatment (Sbihi & Eglese, 2010).

In most developing countries, especially in Africa, waste management currently receives very little attention even if the waste generation is escalating

(Kinobe, Gebresenbet & Vinnerås, 2012). There is growing social pressure in Africa for organizations to reduce their rates of consumption of nonrenewable natural resources and in parallel, to also reduce the release of post-production and post consumption waste to landfills, water bodies and air, thereby causing damage to the environment. On average, one to two thirds of the solid waste generated is not collected in these countries (Kinobe et al., 2012).

The status of waste disposal in Kenya is not any better than other developing countries of Africa as noted by Rotich, Zhao and Jun (2006). The use of trucks older than 10 years for waste collection for over 10 years has limited the waste collection capacity in Nairobi. This is even worsened during the rainy season when roads are inaccessible and impassable coupled with the worn out tyres of the trucks. The use of many old vehicle trucks was considered a good example (Rotich et al., 2006).Manufacturing is an important sector in Kenya and it makes a substantial contribution to the country's economic development. Manufacturing firms are perceived to play an important role in the implementation of sustainable options. These requires a comprehensive means to reduce pollution through identification and eliminating the sources of pollution at every stage of the product life cycle that include raw material extraction, transportation, manufacturing, product use, recycling, and disposal (Mwaura *et al.,* 2015).

Manufacturing is the art of transformation of raw materials into either intermediate goods or final products through the mechanized process. Manufacturing sector comprises establishment that engages in the mechanical, physical or chemical transformation of materials, substances or component into new products. Kenya has a large manufacturing sector serving both the local market and exports to the East African region and the rest of the world. It is dominated by subsidiaries of multinationals. Kenya's manufacturing sector is among the key productive sectors identified for economic growth and development because of its immense potential for wealth, employment creation, and poverty alleviation. Also, the sector would continue to provide impetus towards the achievement of Millennium Development Goals (MDGs) both in the medium and long term particularly goal one on Eradication of Extreme Poverty and Hunger and goal eight on Global Partnerships for Development. The sector is expected to play a fundamental role in the growth of the Kenyan economy. The overall purpose of the industry is to increase its contribution to Gross Domestic Product (GDP) by at least 10 percent per annum (Kimani, 2013).

Under the economic pillar of the Kenya Vision 2030, manufacturing is one of the key sectors expected to deliver the envisaged 10 per cent economic growth rate per annum, by increasing and sustaining its contribution to Gross Domestic Product (GDP) by at least 10 percent per annum. The sector would also support the country's social development agenda through the creation of jobs, generation of foreign exchange, and attracting local and five foreign investment.

Statement of the Problem

Stakeholder pressure arising from; investors, shareholders, customers, and non-profit organizations continue to push sustainability into supply chain, making the green initiatives to be seen as very critical to the firms to address key impacts in product life cycle, representing opportunities for retailers to minimize risks, cut costs, enter new markets and building their reputation with customers (Wollmuth & Ivanova, 2014). In Kenya, despite the manufacturing firms embracing environmental initiatives and making tremendous attempts by organizations to adopt

green initiatives; the UN Global corporate sustainability report compact (2013), revealed that companies are increasingly talking about supply chain sustainability and making solid progress on setting expectations for suppliers, however, they are yet to support expectations with concrete actions that drive sustainability performance in their supply chain. Manufacturing firms are perceived to play an important role in the implementation of sustainable options. Mwaura et al. (2015) however found that due to lack of awareness on the importance of sustainability, there is a low level of adoption of reverse logistics practices in Kenya. Wasonga and Njihia (2014) also established there is limited empirical evidence as to how green practices such as reverse logistics influence performance of manufacturing firms. This may be as a result of low rate of adoption as well as challenges facing implementation of green procurement practices in manufacturing sector in Kenya (Gatari & Were, 2014). There is need to establish the determinants of adoption of reverse logistics practices in manufacturing sector in Kenya. A review of the local studies show that Gatari and Were (2014) examined the challenges of green supply chain management and acknowledged low rate of adoption green supply chain management practices. On the other hand, Mwaura et al. (2015) investigated the effect of reverse logistics practices on competitiveness of food manufacturing firms in Kenya. The study established that reverse logistics helped curb waste, enhance cost savings thus increasing competitiveness. It is against this background that the study sought to examine the determinants of reverse logistics practices in manufacturing firms in Kenya, with a focus on manufacturing firms in Nairobi County.

Objectives of the Study

The general objective was to examine the determinants of adopting reverse logistics in manufacturing firms in Nairobi City County, Kenya. The specific objectives were:

- To examine the influence of resources on adoption of reverse logistics in manufacturing firms in Nairobi City County
- To determine the influence of organization culture on adoption of reverse logistics in manufacturing firms in Nairobi City County.

LITERATURE REVIEW

Theoretical Review

Resource Based View Theory

The theory guided the study in investigating the relationship between resources and adoption of logistics in manufacturing firms. Penrose (1959) provided initial insights of the resource perspective of the firm. However, the resource-based view of the firm (RBV) was put forward by Wenerfelt (1984) and subsequently popularized by Barney's (1991) work. Many authors for example Nelson & Winter (1982); Dierick & Cool (1989); Mohoney & Pandian (1992); Eisenhardt & Martin (2000); Zollo & Winter (2002); Zahra & George (2002) and Winter (2003) made significant contribution to its conceptual development. The theory emphasized the importance of organization resources and their influence on performance and competitive advantage in the market. According to RBV, every organization has its own unique resources that enable it to remain competitive in the market, by addressing the rapidly changing environment (Helfat, 2007). These resources may be financial, human, physical, technological and information. These may be valuable, rare and non-substitutable (Crook, Ketchen, Combs & Todd, 2008). The Resource Based View of the firm (RBV) explains that each firm has resources and capabilities, and that there are resources that can be exploited and become sources of competitive advantage under certain conditions. Initiated in the mid-1980s, the resource-based view (RBV) has since become one of

the dominant contemporary approaches to the analysis of sustained competitive advantage (Barney, 2005). A resource is an observable (but not necessarily tangible) asset that can be valued and traded such as a brand, a patent, a parcel of land, or a license. A capability, on the other hand, is not observable (and hence necessarily intangible), cannot be valued, and changes hands only as part of its entire unit (Makadok, 2009). The existence of capabilities and resources heterogeneity within a population of firms is one of the principles of the RBV (Helfat&Peteraf, 2008). RBV starts with the assumption that the desired outcome of managerial effort within the firm is a sustainable competitive advantage (SCA). Achieving a SCA allows the firm to earn economic rents or above-average returns. In turn, this focuses attention on how firms achieve and sustain advantages. The Resource-Based view contends that the key to Sustained Competitive Advantage lays in the possession of certain key resources, that is, resources that have characteristics such as value, barriers to duplication and appropriability. A Sustained Competitive Advantage can be obtained if the firm effectively deploys these resources in its product-markets. Therefore, the RBV emphasizes strategic choice, charging the firm's management with the important tasks of identifying, developing and deploying key resources to maximize returns (Rumelt, 2011). The Resource-Based View (RBV) offers critical and fundamental insights into why firms with valuable, rare, inimitable, and well organized resources may enjoy superior performance (Barney, 2005). In summary, from a Resource-Based perspective, Sustainable Competitive Advantage is the outcome of resource selection, accumulation and deployment (through organizational capabilities), and is based upon the premise of firms' resource heterogeneity.

Institutional Theory

Institutional theory contends that actions taken by firms are driven by the external pressures they face (Scott, 1994). More specifically, according to the institutional theory, firms adopt these initiatives in order to gain legitimacy or acceptance within society. Different forms of isomorphic pressures have been identified – namely coercive, normative and mimetic pressures – which lead to the adoption of similar practices across firms (DiMaggio and Powell, 1983). While Jennings and Zandbergen (1995) were among the first to explain the adoption of practices within the environmental context, several scholars have subsequently investigated the positive impact of these institutional pressures on green procurement (Sarkis *et al.,* 2010; Zhu *et al.,* 2008). This theory seeks to explain how different external factors (pressures) as well as firm-specific variables can explain why firms pursue green procurement.

Conceptual Framework

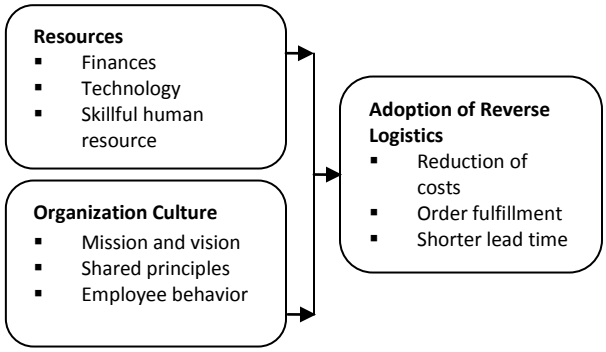

Figure 1: Conceptual Framework

Resources

Scarcity of resources, increasing international markets regulatory pressures and environmental-based trade barriers has forced manufacturers to realize the importance of improving their environment and to implement sustainable practices that reuse/recycle critical resources (Lai

and Wong, 2012). Firms compete based on their resources and capabilities, and distinctive capabilities of firms are critical resources of sustained competitive advantage and superior performance. Depending on resource allocations, firms may have strategies to improve capabilities, or develop relationships (e.g. outsourcing, strategic alliance, or joint venture) to implement reverse logistics efficiently (Mellewigt and Nothnagel 2011). Skinner, Bryant, and Richey (2008) discuss how contributing the appropriate amount of resources to a reverse logistics program will increase the likelihood of success. This may seem like common sense but points out that the more resources are placed into reverse logistics operations the more profitable it will become. Jack, Powers, and Skinner (2010) also focuses on resource commitments to reverse logistics operations and the influence of the customer. It not only addresses revenue but costs savings as well. Their study argument is on how important it is to start or increase the resources available to a reverse logistics operation.

Organization Culture

Discussions around the importance of culture in reverse logistics typically focus on the need to establish an organizational culture which not only supports reverse logistics, but also recognizes the importance of a holistic approach to reverse logistics. While this discussion is important, there is another culture discussion – one which is critical to success and, one which is, more often than not, forgotten. This forgotten discussion is on the significance of culture when taking reverse logistics operations international (Lee, 2017). Aligning reverse logistics to an organizational culture that is isomorphic to ecological sustainability can provide the sought-after legitimacy the institutional theory imposes. Specifically, societal and resource drivers impose industry to focus on ecological sustainability (Zailani et al. 2012). For a company that has to deal with different cultures, and has in the past in order to get other actions done, would see that reverse logistics is a worthwhile endeavor, regardless of the potential barriers (Skinner, Bryant & Richey, 2008). A multi-national company for example has a lot of cultures to contend with in order to make its operations effective and most importantly, profitable. When deciding to implement a reverse logistics program for the entire organization, dealing with these different cultures can have some barriers that need to be overcome depending on the location. Reverse logistics is a very profitable endeavor that shouldn't be overlooked or under resourced.

Adoption of Reverse Logistics

The adoption and implementation of reverse logistics is necessary to achieve the goals of sustainable development which focuses on both environmental and economic goals (Dowlatshahi, 2000). Reverse logistics involves re-use and recovery of products, hence reducing the negative effects on environment and waste disposal (Kleindorfer et al., 2005). Lau and Wang (2009), argue that practicing reverse logistics can help reduce waste and increase profit through an effective recycling process in the developing countries. Furthermore, the increase in awareness on environmental issues and the benefit of recycling places more pressure on firms to create a better reverse logistics strategy. The products that have already joined the supply chain may also be channeled back on grounds of being defective or of poor quality. In practical business environment, products that majorly reverse their course in the supply chain are; manufacturing returns, commercial returns, recalled products, warranty returns, service returns, end-of-use returns and end-of-life returns (Price Water House Coopers, 2008). These products are returned due to reasons such as; poor packaging and quality issues (Brito, et al., 2002). According to Schatteman (2010), products arereturned because of the

following reasons; unsatisfactory quality, installation or usage problems, warranty claims, faulty order processing, retail overstock, end of product life cycle or product replacement and manufacture recall. As Price Water House Coopers (2008) points out, returned products often go through a recovery process. The process involves; product/materials acquisition, products/materials collection, product sorting, testing, products recovery and depending on the final state, product redistribution and sales or disposal. Bort, et al. (2012) Reverse logistics accounts for significant portion of logistics cost. For instance, in the US, reverse logistics accounts for 10.7 percent of the total logistics cost and is approximately a half of the US's gross domestic product. Hazen et al. (2001) identified three practices of reverse logistics; reuse, remanufacture and recycle. Reuse is where the customers return unused product back to the seller, normally the retailer. When this happens, the products are reintroduced into the supply chain. Reuse also includes return of reusable packaging materials. When products are returned to retailers, the products return to the organization through reverse logistics. Remanufacture on the other hand involves repair, refurbishing and overhauling an item to revive the original product. Normally, only products are not in their usable state or are beyond repair are remanufactured. Organizations with properly managed supply chain activities can use remanufacturing to enhance their economic performance since they are able to create value in products that had already lost value. It brings back life in a dead product. Recycle is the third component of reverse logistics and involves recovering all returned materials and products to reintroduce value into the products.

Empirical Review

Resources

Siew (2015) conducted a study on the relationship between green product design, reverse logistics, product disposition and business performance among electrical and electronic manufacturing firms in Malaysia. The study revealed that reverse logistics and resource commitment were antecedents of reverse logistics product disposition. Consequently repair, remanufacture and recycling contributed to business performance by boosting profitability and sales growth. Kiberenge (2014) did a study on the adoption of reverse logistics in information and communications technology firms in Kenya. The study found that many of the operators in the ICT sector have adopted reverse logistics to appreciable levels due to its significance for their operations. The study also found out that the main barriers to effective adoption of reverse logistics practices were inadequate financial resources, inadequate human capital, poor collaboration between supply chain partners, poor IT infrastructure and company size. The study also outlined the main drivers of reverse logistics as government support, resource allocation, quality of returned products and performance measurement of reverse logistics.

Organization Culture

Kabergey and Richu (2015) conducted a study to examine the effect of reverse logistics on operational performance of sisal processing firms in Nakuru County. The study found out that reverse logistics positively affected the operational performance of sisal processing firms in Nakuru County. The researcher concluded that management of processing firms look at reverse logistics as a strategy to achieve competitive advantage and manage it strategically just like other key management areas. Price Water House Coopers (2008) conducted a research on how to achieve an

agile and efficient reverse chain within the consumer electronics industry. In their report, they pointed out that reverse logistics is not one party's affair. They also established that reverse logistics operations are critical functions of supply chain and therefore need to be properly managed. The report proposed five points' recommendations that may be adopted by any organization in its reverse logistics. The first recommendation is that the process must start with analysis of the current situation in the reverse chain. This enables the organization to prioritize, eliminate unnecessary costs and maximize returns. The second recommendation is that there must be awareness a cross the organization that a customer centered approach of management does not only create value but also maintain value in the organization. This will organization'sperception and approach of managing reverse supply chain operations. The next recommendation is that reverse logistics operations must be optimized from an operations perspective soas to maximize value to the organization. The forth recommendation is that the reverse logistics operations must be aligned with customer requirements. It must therefore take a multidimensional approach considering organizational structure, systems, structure and people. Lastly, management of reverse operations must be a collaborative affair where every player has clearly outline roles.

METHODOLOGY

This study used a descriptive research design because according to Mugenda & Mugenda (2008), the purpose of descriptive research is to determine and report the way things are and it helps in establishing the current status of things and helps the study to observe, analyze and draw reliable findings. The study collected primary data though a questionnaire. The questionnaire had both closed and open ended questions. The data collected through the questionnaire was edited, coded, entered into SPSS which also aided in the data analysis. The data was analyzed using descriptive and inferential statistics.

FINDINGS AND PRESENTATION

Resources

The study sought to assess the influence of resources on adoption of reverse logistics in manufacturing firms in Nairobi City County, Kenya. This study presented the findings to statements posed in this regard with responses given on a five-point likert scale (where 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5= Strongly Agree). Table 1 presented the findings. The scores of 'strongly disagree' and 'disagree' had been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'Neutral' had been taken to represent a statement equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' had been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5.0.

Table 1 presented the findings as tabulated, a majority of respondents were found to highly agree that there were sufficient and qualified procurement personnel to enhance adoption of reverse logistics in the firm (3.220). There was adequate training and simulation for key stakeholders on enhancement of reverse logistics in the firm (3.456); there was provision of competitive wages and benefits for procurement personnel reverse logistics in the firm (3.908); There was adequate funding for procurement processes reverse logistics in the firm y (3.652); the organization used IT in their Procurement process (3.210); All activities were captured in the planned budget to improve reverse logistics in the firm (3.652); Fund disbursement for procurement processes was timely (3.680). The firm used IT in

our Procurement process (3.456); there was timely delivery of goods and services (3.113); there was timely processing of payment to contractors (3.198). The study findings were in tandem with literature review by Lai and Wong (2012) who stated that the firms compete based on their resources and capabilities, and distinctive capabilities of firms are critical resources of sustained competitive advantage and superior performance. Depending on resource allocations, firms may have strategies to improve capabilities, or develop relationships (e.g. outsourcing, strategic alliance, or joint venture) to implement reverse logistics efficiently.

Table 1: Influence of Resources on Adoption of Reverse Logistics in Manufacturing Firms

Resources	Mean	Std. Dev
There is sufficient and qualified procurement personnel to enhance adoption of reverse logistics in the firm	3.220	.562
There is adequate training and simulation for key stakeholders on enhancement of reverse logistics in the firm	3.456	.520
There is provision of competitive wages and benefits for procurement personnel reverse logistics in the firm	3.908	.368
There is adequate funding for procurement processes reverse logistics in the firm	3.652	.310
All activities are captured in the planned budget to improve reverse logistics in the firm	3.210	.490
Fund disbursement for procurement processes is timely	3.652	.209
The firm uses IT in our Procurement process	3.680	.801
There is timely Delivery of goods and services	3.456	.380
There is timely processing of payment to contractors	3.198	.458

Organization Culture

The study sought to assess the influence of organization culture on adoption of reverse logistics in manufacturing firms in Nairobi City County, Kenya. This study presented the findings to statements posed in this regard with responses given on a five-point likert scale (where 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5= Strongly Agree). Table 2 presented the findings. The scores of 'strongly disagree' and 'disagree' had been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'Neutral' has been taken to represent a statement equivalent to a mean score of 2.6 to 3.4. The score of 'agree' and 'strongly agree' had been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5.0.

Table 2 presented the findings of the study as tabulated; a majority of respondents were found to highly agree that the structure had created division of work to facilitate compliance with rules and regulations (3.765). The departmentalization ensured easy of communication thus lead time reduction (3.287); there was provision of competitive wages and benefits for procurement

personnel reverse logistics in the firm (3.280); Standardization of work process facilitated reduction of costs (3.277); The coordination was achieved by means of output targets and specifications to the compliance of rules and regulations (3.290). Aligning reverse logistics to an organizational culture that was isomorphic to ecological sustainability could provide the sought-after legitimacy the institutional theory imposes. Specifically, societal and resource drivers impose industry to focus on ecological sustainability (Zailani et al. 2012).

Table 2: Influence of Organization Culture on Adoption of Reverse Logistics in Manufacturing Firms

Organization Culture	Mean	Std. Dev
The structure has created division of work to facilitate compliance with rules and regulations	3.765	.469
The departmentalization ensure easy of communication thus lead time reduction	3.287	.562
There is a proper coordination to ensure individual take responsibility thus quality improvement	3.280	.332
Standardization of work process facilitates reduction of costs	3.277	.220
The coordination is achieved by means of output targets and specifications to the compliance of rules and regulations	3.290	.388

Adoption of Reverse Logistics

The study sought to examine the determinants of adoption of reverse logistics in manufacturing firms in Nairobi City County, attributed to the influence of resources and organization culture. The study was particularly interested in three key indicators, namely order fulfillment, cost reduction and lead time reduction, with all the three studied over a 5 year period, running from 2012 to 2016.. Findings in Table 3 revealed improved adoption of reverse logistics in the organization across the 5 year period running from the year 2012 to 2016. Order fulfillment recorded positive improvement with a majority affirming to less than 10% in 2012 (38%) and 2013(36%), to 10% in 2014 (36%) then more than 10% in 2015 (40%) and 2016 (36%).A similar trend was recorded in cost reduction, growing from less than 10% (40%) in 2012, to more than 10% in 2013 (35%), 2014 (36%) and 2016 (38%). Lead time reduction further recorded positive improvement with a majority affirming to less than 10% in 2012 (38%) and 2013 (36%), to 10% in 2014 (34%) and 2015(40%) then by more than 10% in 2016 (36%). It was deduced from the findings that adoption of reverse logistics in manufacturing firms indicators had considerably improved as influenced by the resources and organization culture. The order fulfillment lead time reduction had particularly improved by at least 10 percent across most of the manufacturing firms pointing to the significance of

resources and organization culture in the supply chain process.

Table 3: Adoption of Reverse Logistics

Quality of Goods Purchased	**2012**	**2013**	**2014**	**2015**	**2016**
Increased by less than 10%	38	36	34	32	30
Increased by 10%	28	34	36	28	34
Increased by more than 10%	34	30	30	40	36
Cost Reduction	**2012**	**2013**	**2014**	**2015**	**2016**
Increased by less than 10%	40	35	32	26	26
Increased by 10%	36	34	32	34	36
Increased by more than 10%	24	32	36	40	38
Lead time Reduction	**2012**	**2013**	**2014**	**2015**	**2016**
Increased by less than 10%	38	34	32	26	32
Increased by 10%	36	30	34	34	32
Increased by more than 10%	26	36	34	40	36

CONCLUSION AND RECOMMENDATIONS

The study established that lack of adequate resources affected adoption of reverse logistics in the manufacturing firms. There was lack of qualified procurement personnel to enhance adoption of reverse logistics in the firm. There was inadequate training and simulation for key stakeholders on enhancement of reverse logistics in the firm. There was provision of competitive wages and benefits for procurement personnel reverse logistics in the firm. There was adequate funding for procurement processes reverse logistics in the firm.

The study established that the structure had created division of work to facilitate compliance with rules and regulations. The departmentalization ensured easy of communication thus lead time reduction. There was provision of competitive wages and benefits for procurement personnel reverse logistics in the firm. Standardization of work process facilitated reduction of costs. The coordination was achieved by means of output targets and specifications to the compliance of rules and regulations was inadequate

The study sought to examine the determinants of adoption of reverse logistics, attributed to the influence of resources and organization culture. From inferential statistics, a positive correlation was seen between each determinant variable and adoption of reverse logistics. The strongest correlation was established between resources and adoption of reverse logistics. Both independent variables were found to have a statistically significant association with the dependent variable at ninety-five level of confidence. Analysis of variance was further done and it was established that there was a significant mean. This was since the p values of their coefficients were all less than 0.05.

Conclusions of the Study

Based on the study findings, the study concluded that adoption of reverse logistics in Kenya was affected by resources and organization culture as the major factors that mostly influence adoption of reverse logistics in Kenya.

The study concluded that resources were the first important factor that affected adoption of reverse logistics in manufacturing firms in Kenya. The regression coefficients of the study showed that

resources had a significant influence on adoption of reverse logistics in manufacturing firms Kenya in Kenya. This implied that increasing levels of resources would increase the levels of adoption of reverse logistics in manufacturing firms I Kenya. This showed that resources had a strong positive influence on adoption of reverse logistics in manufacturing firms in Kenya.

The study concluded that organization culture was the second important factor that affected adoption of reverse logistics in manufacturing firms in Kenya. The regression coefficients of the study showed that organization culture had a significant influence on adoption of reverse logistics in manufacturing firms Kenya in Kenya. This implied that increasing levels of organization culture would increase the levels of adoption of reverse logistics in manufacturing firms in Kenya. This showed that organization culture had a strong positive influence on adoption of reverse logistics in manufacturing firms in Kenya

Recommendations of the Study

Resource allocation was an important aspect in determining how effective the adoption of reverse logistics in manufacturing firms will be. This calls for manufacturing firms to try and balance resource allocation and even allocate more funds to procurement departments. This is because procurement is the base of all other departments and its success percolates down to the whole organization. It's imperative that as procurement resource allocation planning is done in a manner that it takes care of the pursued strategic fit in the manufacturing firms.

There is need to enact more stringent government regulations in order to streamline procurement process that will uniformly apply to all manufacturing firms to adopt reverse logistics. The same should be made to ensure a system of accountability where both the public officials directly or indirectly involved in the procurement process as well as in the implementation of procurement contracts and the private parties that deal with public procurement are, when warranted by circumstances, investigated and held liable for their actions relative thereto. There is also need for the laws and regulations to mainstream public monitoring of the procurement process and the implementation of reverse logistics.

Areas for Further Research

The study was a milestone for further research in the field of procurement performance in manufacturing firms in Africa and particularly in Kenya. The findings demonstrated the important factors to enhancement of adoption of reverse logistics to include; resources and organization culture. The current study should therefore be expanded further in future in order to determine the effect of procurement legal framework on adoption of reverse logistics firms in manufacturing firms in Kenya. Existing literature indicates that as a future avenue of research, there is need to undertake similar research in other government institutions and public sector organizations in Kenya and other countries in order to establish whether the explored factors can be generalized to affect adoption of reverse logistics in manufacturing firms in the public sector.

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