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EFFECT OF LOGISTICS MANAGEMENT ON SUPPLY CHAIN PERFORMANCE. A CASE OF MAGERWA LTD

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Abstract

The research study was Effect of logistics management on supply chain performance. A case of Magerwa Ltd ,the target population was **200** employees and sample size was the same as **200** respondents .The study applied theories in order to show coherences of Literature o the study and these included of Revealed Preference Theory Firm Theory and Theory of Constraints Study employed descriptive statistics and inferential statistics, and data was analyzed with aid of SPSS software program version 25.0 ,descriptive statistics and inferential statistics were employed to present frequencies tables, percentages, mean and standard deviation and Inferential analysis was used in order to use Pearson correlation and multiple regression model to test the relationship between the independent variables and dependent variable. Descriptive statistics used to produce frequency tables, percentages, mean and standard deviation. Inferential statistics were used in order to provide person correlation and multiple regression model to test and draw relationship between variables both for independent band dependent, was influence of packaging logistics. The overall means of results was **4.44,** the effect of warehousing management. The overall means of results was **4.38,** the effect of inventory management. The overall means of results was **4.34**, effect of distribution management. the overall means of results was **4.42** and the data on supply chain performance was analyzed, the overall means of results was **4.69**, depending on the results, it presented that the supply chain performance was on good grades. It showed that the relationship between Packaging logistics, warehousing management, inventory management, distribution management and supply chain performance was **0.795, 0.625,0.772 and 0.727** respectively, The results present the variables of logistics management; Packaging logistics was statistically significant with p value=0.000[b], the warehousing management was statistically significant with p value=0.000[b], and inventory management was statistically significant with p value=0.001[b] and the distribution management was not statistically significant with p value=0.0585[b].It concluded that there was a significant relationship between the role of value chain strategy in logistics and supply chain performance. The study recommended that MININFRA and MINICOM jointly as ministries can be in charge in mobilization of community at large in Rwanda, for them to be part and be involved in logistics and supply chain performance and come up with management works to attain money personal economic enhancement.

Keywords: *Logistics management, supply chain performance, packaging logistics, warehousing management, inventory management, distribution management*

1. Introduction

Logistics management is a part of supply chain Management that plan, implement, and manage the reliable, efficient forward and reverse movement and storage of products, services and related information between the point of origin to the point of consumption to meet customers' expectations, according to the council of supply chain management professionalism of consumption, it is proven by ineffectual logistics management system and inactive internal logistics management team that harm and destroy the whole logistics management aligned with supply chain performance and later on, affects to achieve the customers' expectations in terms of affordability lower prices at shortest viable time set that ought to including inaccuracy quality levels to meet customers' needs which in turn may lead organization to the competitive Advantage situation against the rivals [7]

In the United States, logistics management has significant transformation due to technological innovations and the rise of e-commerce. As noted by [16], the United States has a vast and complex supply chain, characterized by its heterogeneous distribution networks. The capacity to process and deliver products efficiently has become a competitive advantage, with firms investing in automated systems, big data analytics, and real-time tracking to improve their logistics capabilities [16]

Africa continent is not performing well in practice of logistics compared to other continents as the report confirmed that from World Bank the top four countries were from Europe, the fifth one was from Asia however, the bottom five were all from Africa [34]Consequently, inefficient transport and communication formed a major obstacle in achieving efficiently organized flows of goods and services in Africa, as cited by [23].The result of this reports shows there is less concern about logistics management practice in African countries.

In the East African context, logistics management has emerged as a vital factor influencing supply chain performance amid growing economic activity and regional integration efforts. Countries such as Kenya, Tanzania, and Uganda are witnessing increased trade volumes and investments, driven by improvements in infrastructure and trade policies [35]. However, logistical challenges, including inadequate transport networks, customs inefficiencies, and limited access to technology, continue to hamper supply chain effectiveness [17].

In Rwanda there are few studies were done on logistics management and organisational performance, none of them focussed on logistics management in Rwanda also involve the participation of Logistics companies whereby Gorilla Logistics Ltd is among, Gorilla Logistics Ltd is a regional Freight Forwarding Company that opened shop in Rwanda in 2008. the company has demonstrated how commitment and skillful application of knowledge can translate into eloquent performance as reflected in the award the company won recently. The token of recognition is a telling register of its path of growth to delivering services in Logistics management.

2. Statement of the Problem

Efficient logistics management is crucial for the optimal performance of an organization's supply chain. However, inadequate internal management systems often impair the effectiveness of logistics operations, leading to poor supply chain performance. Magerwa Ltd faces several challenges in its logistics system, including inefficiencies in material handling equipment, congestion caused by heavy cargo volume, and delays in cargo clearance processes. The company owns significant space for truck parking but lacks the necessary infrastructure to handle the volume of trucks effectively. This results in suboptimal capacity utilization and delays in supply chain operations.Furthermore, the company's inland container terminal, which has an annual throughput capacity of 120,000 TEUs, suffers from inefficiencies in cargo clearing, division forwarding, and truck operations. These challenges are compounded by poor practices in the application of transportation, warehouse management, and inventory control, which are central issues in logistics management. In general, organizations often face problems related to logistics information management, as highlighted by [26] and these issues hinder the smooth flow of goods and services in the supply chain. The impact of inefficient logistics management can be seen in the significant financial losses companies face. For example, U.S. manufacturers were reported to have over $1.9 trillion in unsold inventory at the end of 2017 [32] indicating how poor inventory management and logistics inefficiencies can lead to substantial economic losses. Similarly, a study of the Ethiopian Pharmaceuticals Supply Agency found that improper inventory management resulted in a 2.1% wastage rate, leading to a loss of over $2 million due to expired and damaged goods [4]. These examples underscore the need for improved logistics management systems to enhance supply chain performance. Given these challenges, the researcher intended to investigate the effect of logistics management on supply chain performance, a case study Magerwa Ltd

3. Objective of the study

3.1 General Objective

The general objective of the study is to examine the effect of logistics management on Supply chain performance. A case of Magerwa Ltd

3.2 Specific Objectives

i. To assess the influence of packaging logistics on supply chain performance in Magerwa Ltd
ii. To investigate the effect of warehousing management on supply chain performance in Magerwa Ltd
iii. To examine the effect of inventory management on supply chain performance in Magerwa Ltd
iv. To examine the effect of distribution management on supply chain performance in Magerwa Ltd

4. Research Hypothesis

Ho_1= There is no significant the influence of packaging logistics on supply chain performance in Magerwa Ltd

Ho_2= There is no significant effect of warehousing management on supply chain performance in Magerwa Ltd

Ho_3= There is no significant effect of inventory management on supply chain performance in Magerwa Ltd

Ho_4= There is no significant the effect of distribution management on supply chain performance in Magerwa

5. Literature Review

5.1 Theoretical Framework

5.1.1 Logistics Management

Logistics management is a crucial component of supply chain management that focuses on the planning, implementation, and control of the efficient and effective movement of goods, services, and related information. It involves managing the forward flow of materials from the point of origin to the point of consumption while ensuring that customer needs are met. Additionally, logistics management includes the reverse flow of goods, which may involve the return of goods from consumers to the origin. Key areas of logistics operations include inbound and outbound transportation, fleet management, warehouse management, material handling, and services provided by third-party logistics providers. These functions are essential for maintaining smooth and timely operations across the supply chain, ensuring that products are available at the right time, in the right condition, and in the right quantities to meet customer demands [10, 31]

Packaging logistics

The issues that have raised great interest among researchers, because it can be considered a source of competitive advantage [6,8,12,14]. Package is made up of several elements that work together to persuade customers to purchase a product [2]

Warehouse management

A warehouse can be considered as a spinal cord of small and medium enterprises including manufacturing organizations that carries out various logistics activities. An ideal manufacturing organization can be measured by its efficacy in warehousing decisions [15]. A warehouse should be located near a point of consumption and should be able to store sufficient products in case of unforeseen demand of product [36].

Inventory management

Proper inventory management ensures seamless supply of products but also cuts down on storage costs [25]. Logistics ensure that there is neither excess of products in inventory nor deficit [20]. Haphazardly managed inventory was slower the profits of manufacturing firms and may even lead to pilferage in the stocks [22]. According to [24] inventory is the storage of any material or item used by a company.

Distribution management

Physical distribution is a whole process that concern also materials and finished product, a physical (spacial) movement of goods from the manufacturers to intermediaries and finally to the ultimate consumer [21]. There are various routes that products or services use after their production until they are purchased and used by end users. These channels are referred to as distribution channels or marketing channels. Therefore, distribution channels are all those organizations that a product has to go through between its production and consumption [18].

5.1.2 Supply chain Performance

Before defining the concept of supply chain performance, let's start with the concept of the supply chain. The literature offers various definitions of the "Supply Chain" concept, among which stand out those of Chopra [5, 13, 31]. [5] Depicts the supply chain as a system encompassing all parties involved, directly or indirectly, in satisfying a customer demand. Efficiency in production, stakeholders' relationships, adoption of new marketing strategies and production capacity improves the market a merged and or acquired organization controls [28] this relates to how well an organization transforms inputs into outputs. To measure efficiency, it is necessary to compare actual organizational production to some standard or benchmark that, if achieved, is considered efficient [27].

5.3 Theoretic Review

Revealed Preference

The Revealed preference theory was put forward by [29]. This theory states that in course of management, inferences are usually made from preferences made by individuals in the organization. [19] Added to this theory that human preferences were philosophical and pegged on motivation. The most striking study objective related to this theory is the ordering process. In Binmore [3] used a leaf from Samuelson and Little. He modified the Revealed Preference Theory to be called Hypothetical Preference Theory. The Hypothetical revealed preference Theory used two types of agents denoted by x and y respectively. In Binmores view, an agent when faced with choices would choose y from any set of alternatives including x.

There are various limitations of the Revealed Preference Theory. First and foremost, the theory created a choice for either x and y. in business reality, there can be a situation whereby there is only one choice and no preferences for agents in the supply chain to choose from. The second limitation of the theory is that the preferences made by agents in the supply chain are to a large extent influenced by beliefs and perceptions, it is in this regard, the researcher adopted the theory by employing the study on effect of logistics management on supply chain performance. A case of Magerwa Ltd

Theory of Constraints

The Theory of constraints (TOC) was recognized in broad context as a management philosophy and coined [9]. that initially started and implemented in advance way and through improvement focusing on constraints prohibited a system from a achieving a higher level of performance, the Paradigm drawn from the theory states that at least each firm must encounter a problem or constraint [30] As it was cited by [30]Creation of competitive advantage can be drawn from collaborative firms which have in common the responsibilities and benefits through their upstream and downstream partnership.[11] acknowledged that semi-circular market requirement.The main problem observed was that logistics 'activities had not been achieving better results related to profitability and efficiency, because most of the time, each one of them just considered its local constraints as the own problems. [9] also predicted that the TOC approach could be used to guide a single firm to concentrate on exploiting resources based on different logistics cost along the supply chain.[30] applied the TOC orientation thinking process to point out the problems in the logistics management and collective gathering together managers from different firms to cooperate in improving the overall firm profit [30] [9].TOC was therefore useful in measuring and evaluate the moderating effect of logistics management information system on supply chain performance. A case study of Magerwa Ltd to explore the impact of order process management on organizational performance in Gorilla logistics and the theory was to compare, explore and analyse the impact of transportation management on organizational performance at Gorilla logistics through conducting a collective research study on Effect of logistics management on supply chain performance. A case of Magerwa Ltd

5.4 Empirical review

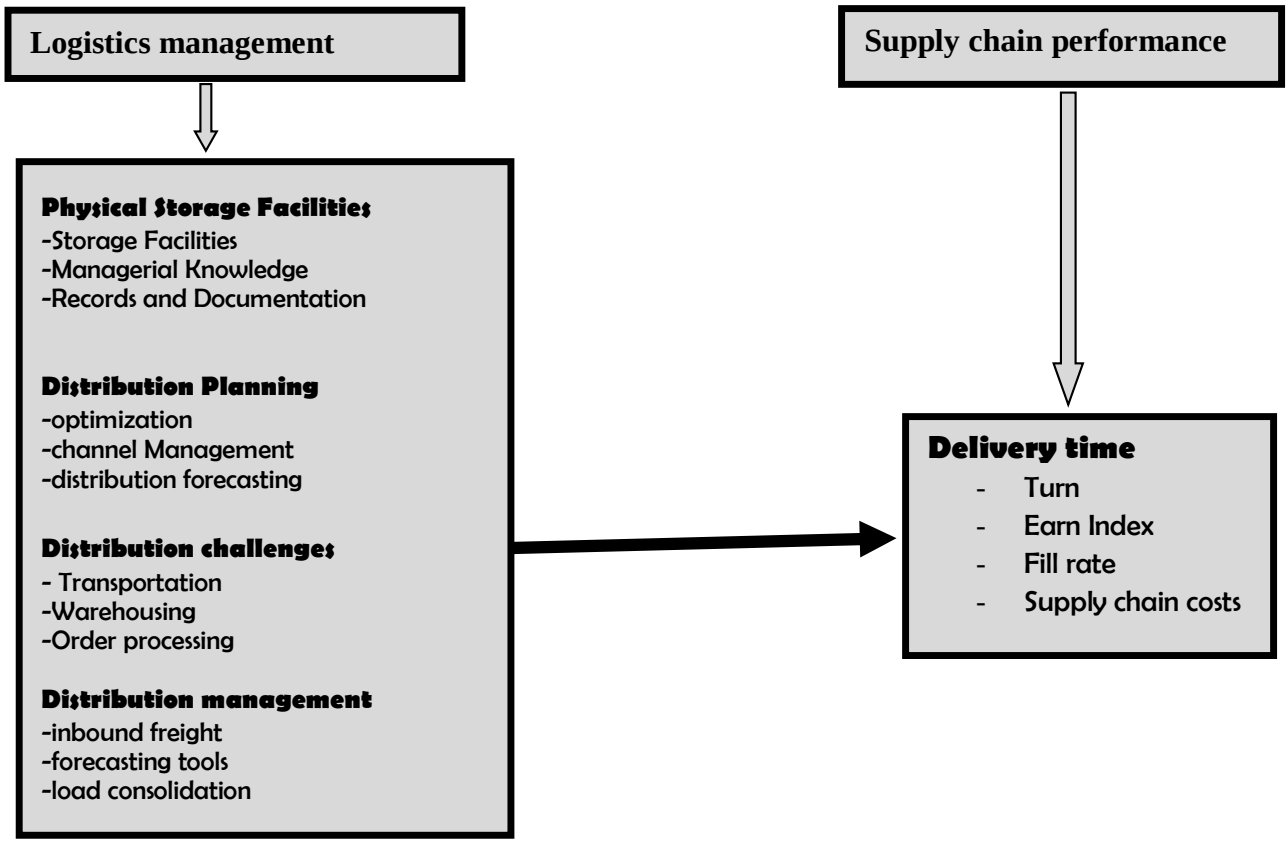
[1] investigate the impact of logistics management on organizational performance to analyze the influence of transportation, inventory, and management and information flow on organizational productivity. Findings of the study shows that transportation management affects organizational effectiveness, there is strong relationship between information flow management

and employees' efficiency, and there is equally strong relationship between inventory management and organizational productivity using Pearson correlation coefficient moment to test the hypothesis. The study concludes that factors associated with logistics management needs to be considered by the organization in their strategic plans as it was contributing significantly to a sustainable development to of the Nigeria economy.

[33]examined influence of logistics management practices on the logistics performance of humanitarian organizations using both descriptive and explanatory research design. The study found that humanitarian organizations engaged transportation management practices that allow for timely deliveries of goods and services to consumers, employ logistics management practices, which help the organization to avoid inventory disruption in the production cycle. The research also found that warehouse management methods promote the delivery of goods to the customers in the appropriate quantity. Based on the regression analysis the study established positive beta coefficients with all dimensions, inventory management practices, transportation practices, information flow practices and warehousing practices. The study concluded that any change made is expected to positively impact logistical effectiveness and efficiencies.

6. Conceptual framework

Figure 1: Conceptual framework of the study



Source: Researcher,2024

7. Methodology

7.1 Research Design

The descriptive approach was used in order to interpret & analyze data and this research design is the basic foundation of the study. According to Devi (2017), research design is the blue print or detailed plan of how a research study was conducted. This is crucial because it determines the success or failure of the research, it guides the researcher throughout the investigation by providing

steps, methods and procedures to follow for the collection and analysis of data so that conclusion may be drawn. In this study, the researcher employed descriptive research design and correlational research design. Research study used descriptive and correlation, qualitative and quantitative approaches were adopted. The use of correlational research design was taken to find out for the sake of exercising the relationship between variables, the goal of correlation research was used to determine relationship between variables and extent of which is relationship on the study on study effect of Logistics management on supply chain performance. A case Study of Magerwa Ltd.

7.2 Sampling technique

The research study adopted the purposive sampling for choosing respondents. The main purpose is to select a respondent who are directly in relation to this research area from Administration staff, Finance department staff, Engineer staff, Operation department staff and SCM staff

Table 3.1: Population Distribution and sample determination

Department	Population	Sample size
Administration staff	24	24
Finance Department staff	10	10
Engineering Department staff	38	38
Operation Department staff	46	46
Supplier in charge staff	28	28
Temporary staff	54	54
Total	200	200

7.3 Data analysis

The study employed Data analysis that underwent descriptive research and inferential statistics, Descriptive statistics was employed to enable the production of frequency tables, charts, percentages and mean while using data captured from the fields for analysis, the produced frequency tables, charts, percentage and mean was presented for various characteristics for sets of data. For finding out the importance of the study, the study was employed inferential statistics for retrieving the relationship correlations between components on the effect of project planning on the success of the project (independent variable and dependent variable). Multiple Correlation and regression model was employed to analyze the data; SPSS (Statistical Package for Social Sciences version 25.0) computer software was utilized as the tool for analysis. Inferential statistics including Pearson correlation test and multiple regression analysis was employed in order to find out the relationship between the independent variable and dependent variable Regression is a statistical technique undertaking into determine the linear relationship between two or more variables. Regression is principally use for estimating causal inference. Hence, determination of statistical relationship between two or more variables applicability and Researcher recognized regression model as presented below;

$Y= \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where: Y = Supply chain performance; $\beta 0$ = constant; $\beta_1\beta_2\beta_3\beta_4$ = regression coefficients; X_1 =Packing logistics; X_2 =Warehousing management; X_3 = Inventory management; X_4 = Distribution management g; ε = error term.

8. Research Findings

This part presents the findings from the inferential statistical test that encompassed correlation coefficient and multiple linear regression analysis between the variables that was independent variables and dependent variables for this study

8.1 Table of Correlation

		PACKAGING LOGISTICS	WAREHOUSING MANAGEMENT	INVENTORY MANAGEMENT	DISTRIBUTION MANAGEMENT	SUPPLY CHAIN PERFORMANCE
PACKAGING LOGISTICS	Pearson Correlation	1	.913**	.973**	.911**	.795**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	200	200	200	200	200
WAREHOUSING MANAGEMENT	Pearson Correlation	.913**	1	.936**	.859**	.625**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	200	200	200	200	200
INVENTORY MANAGEMENT	Pearson Correlation	.973**	.936**	1	.908**	.772**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	200	200	200	200	200
DISTRIBUTION MANAGEMENT	Pearson Correlation	.911**	.859**	.908**	1	.727**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	200	200	200	200	200
SUPPLY CHAIN PERFORMANCE	Pearson Correlation	.795**	.625**	.772**	.727**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	200	200	200	200	200

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

Source: Primary data 2024

The results present the relationship between the effect of Logistics management on supply chain performance. A case Study of Magerwa Ltd.The effect of Logistics management factors taken are; Physical Storage Facilities, Distribution Planning, Distribution challenges, Distribution management practice. It is in this regard, the statistical package for social science (SPSS) software version 25.0 was used to determine the Pearson coefficients. The Pearson coefficient correlation is between -1 and 1 where -1 to 0 presents negative correlation (-1 to -0.5 indicates high negative correlation and -0.5 to 0 indicates low negative correlation) and 0 to 1 presents positive correlation (0 to 0.5 presents low positive correlation while 0.5 to 1 presents high positive correlation). According to the results, the correlation between Packaging logistics, warehousing management, inventory management, distribution management and supply chain performance was 0.**795, 0.625, 0.772 and 0.727** respectively, it presents that there was a significant relationship between effect of Logistics management and supply chain performance.

8.2 Regression Analysis

Table 4.3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.844[a]	.713	.707	2.48112

a. Predictors: (constant), Distribution management , Warehousing management , Packaging logistics , Inventory management

Source: Primary data 2024

The results present the Model Summary, the researcher sought to know the effect of Logistics management on supply chain performance. A case Study of Magerwa Ltd , the researcher used regression analysis to measure on the influence of packaging logistics on supply chain performance, the effect of warehousing management on supply chain performance ,the effect of inventory management on supply chain performance ,the effect of distribution management on supply chain performance in Magerwa Ltd,

Correlation coefficient (**R=0.844[a]**) demonstrated the relationship between effect of Logistics management on supply chain performance. A case Study of Magerwa Ltd, therefore the results present the Model Summary, the results present that the R Square=**0.807**. It was statistically significant clear that **71.3%** of all variables of supply chain performance can be explained by one's of all variables of the effect of logistics management in research

Table 4.4 ANOVA[a] of Logistics management and supply chain performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2984.467	4	746.117	121.203	.000[b]
	Residual	1200.408	195	6.156		
	Total	4184.875	199			

A. Dependent variable: Supply chain performance

B. Predictors: (constant), Distribution management , Warehousing management , Packaging logistics , inventory management

Source: Primary data 2024

The results indicate ANOVA[a], the results presented than the variables were statistically significant with F= 746,117and p value=0.000b, it means that there was a significant relationship between logistics management and supply chain performance.

Table 4.5 Coefficients[a] of Logistics management and supply chain performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	20.943	2.549		8.217	.000
	PACKAGING LOGISTICS	1.525	.320	.825	4.760	.000
	WAREHOUSING MANAGEMENT	-1.751	.236	-.808	-7.415	.000
	INVENTORY MANAGEMENT	1.081	.312	.678	3.468	.001
	DISTRIBUTION MANAGEMENT	.105	.193	.052	.547	.585

a. Dependent Variable: SUPPLY CHAIN PERFORMANCE

Source: Primary data2024

The results present the constant of independent variables of Value logistics management. It is statistically significant since p value is less than 0.05. The results present the variables of logistics management; Packaging logistics was statistically significant with p value=0.000[b], the warehousing management was statistically significant with p value=0.000[b], and inventory management was statistically significant with p value=0.001[b] and the distribution management was not statistically significant with p value=0.0585[b] According to SPSS generation of table 4.5 in regard to the equation $Y= \beta 0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$, where by Y= Supply chain Performance of project then the Equation served as;

$Y= 20.943+1.525X_1+-1.751X_2+1.081X_3+0.105X_4 + 2.48112\varepsilon$

From the table 4.5 Coefficients[a] of logistics management and supply chain, Unstandardized Coefficients were used in order to attain the t-test used in explanation above by B values undergo series of dividing from B value and std error thus attainment of the t-test; 20.943 divided 2.549 resulted into constant with 8.217, then 1.525 divided 0.320 resulted into Packaging logistics factor with 4.760,then -1.751 divided 0.236 resulted into warehousing management factor with -7.415, and then 1.081 divided 0.312 resulted into inventory management factor with 3.468 and then 0.105 divided 0. .193 resulted into Distribution management factor with 0.547 value.

8.3 Hypothesis testing

In order to test the study's four formulated hypothesis, the t statistic that tests whether a B value is significantly different from zero (HO: β=0) The study computed simple regression analysis to test the study hypothesis. For p-value<0.05, H0 was rejected; and H4 accepted

Testing research hypothesis one

Ho_1= There is no significant influence of packaging logistics on supply chain performance in Magerwa Ltd. As evident in Table 4.5, the Unstandardized beta value of packaging logistics on supply chain performance in Magerwa Ltd was significantly greater than zero (β_2= 1.525- p-value=0.000<0.05, t= 4.760). Subsequently the null hypothesis was rejected because p-value=0.000 is less than 5% level of significant, hence packaging logistics had a statistically significant influence on supply chain performance in Magerwa Ltd.

Testing research hypothesis two

Ho_2= There is no significant the effect of warehousing management on supply chain performance in Magerwa Ltd. As evident in Table 4.5, the Unstandardized beta value of warehousing management on supply chain performance in Magerwa Ltd was significantly greater than zero (β_2=-1.751 p-value=0.000<0.05, t=-7.415). Subsequently the null hypothesis was rejected because p-value=0.004 is less than 5% level of significant, hence warehousing management had a statistically significant effect on supply chain performance in Magerwa Ltd

Testing research hypothesis three

Ho_3= There is no significant effect of inventory management on supply chain performance in Magerwa Ltd. As evident in Table 5, the Unstandardized beta value effect of inventory management on supply chain performance in Magerwa Ltd was significantly greater than zero (β_3=1.081 p-value=0.001<0.05, t= 3.468). Subsequently the null hypothesis was rejected because p-value=0.001 is less than 5% level of significant, hence inventory management had a statistically significant effect on supply chain performance in Magerwa Ltd

Testing research hypothesis four

Ho_4= There is no significant effect of distribution management on supply chain performance in Magerwa Ltd. As evident in Table 4.14, the Unstandardized beta value of distribution management on supply chain performance in Magerwa Ltd was significantly greater than zero(β_3=0.105 p-value=0.585<0.05, t= 0.547).Subsequently the null hypothesis was accepted because p-value=0.585 is greater than 5% level of significant, hence Distribution management had a statistically insignificant effect on supply chain performance in Magerwa Ltd

9. Conclusions

Logistics management is a highly valuable stake in supply chain manipulation in order to achieve the performance. Logistics management gives out a vital device of how any supply chain works and other related operative activities in which they can be measured and how it can help to the attainment of logistics management and supply chain objectives (Chopra, S., & Meindl, P. 2019). From this view in as far as the study is concerned, a researcher concluded while basing on the results obtained. According to the results, the relationship between; Packaging logistics, warehousing management, inventory management, distribution management and supply chain performance was 0.**795, 0.625,0.772 and 0.727** respectively, and the results presented than the variables were statistically significant with p value=0.000b, it concluded that there was a significant relationship between Effect of logistics management on supply chain performance. A case of Magerwa Ltd

10. Recommendations

According to the results of this study, the researcher provided the following recommendations:

Logistics and supply chain investors should consider the information taken on logistics management and supply chain performance of maneuvers to facilitate the strategy and ensure the sustainability of the alignment of goods for proper logistics and supply chain properties. The government of Rwanda under the Ministry of Infrastructure (MINIFRA) should acknowledge that the

outcomes of effective logistics management must bring positive results to Rwandan people and be part in all value chain of the supply chain as they can be able to generate money thus self-economy improvement to them and their families respectively.

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