

RELATIONSHIP BETWEEN FOURTH PARTY LOGISTICS SERVICES AND PERFORMANCE OF MANUFACTURING FIRMS IN KENYA

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ABSTRACT

This study sets out to investigate the relationship between fourth party logistics services and performance of manufacturing firms in Kenya. More specifically, the study seeks to establish the influence of transport management and logistics information management system on performance of manufacturing firms in Kenya. The study was guided by the logistics theory and the principal agency theory. To achieve this, the study reviewed both theoretical and empirical literature and then proposed the research methodology that address the gaps identified in literature as well as answer the stipulated research questions. This research study adopted a descriptive research design approach. The study preferred this method because it allowed an in-depth study of the subject. Data was collected using self-administered questionnaires. The data collected was analyzed by use of descriptive and inferential statistics. Multiple regression model was used to show the relationship between the dependent variable and the independent variables. The quantitative data generated was keyed in and analyzed by use of Statistical Package of Social Sciences (SPSS) to generate information which was presented using tables, charts, frequencies and percentages. The response rate of the study was 95%. The findings of the study indicated that transport management and logistics information management system have a positive relationship with performance of manufacturing firms in Kenya. Finally, the study recommended that manufacturing firms should embrace fourth party logistics so as to improve performance and further researches should to be carried out in other sectors to find out if the same results can be obtained.

Key Words: *Transport Management, Logistics Information Management, Fourth Party Logistics, Performance*

INTRODUCTION

The competitive manufacturing environment is one that is rapidly changing as globalization and technology force organizations to constantly seek ongoing improvement in all areas in terms of

their knowledge, flexibility and performance (Lau & Zhang, 2016). Logistics, is receiving growing attention as an area in which efficiency and productivity increases can be made in order to improve customer service and to lower costs (Sahay & Mohan, 2016).

According to the manufacturing industry Global Report, Europe accounts for the largest share in the global manufacturing industry, generating revenues of \$1.4 trillion. The industry is affected by many challenges including the economic slump, rising food prices, increasing transportation costs due to a rise in oil prices, and decline in consumers and employing 4 million workers, followed by the US, which contributed \$1 trillion (Tracey & Tan, 2010).

In the African continent, logistics in the manufacturing industry is not performing well compared to other continents as Murphy and Poist (2010) study confirms that the top four countries were from Europe, the fifth one was from Asia however, the bottom five were all from Africa. The top five logistics performers in 2010 were (in order): Germany, Singapore, Sweden, the Netherlands, Luxembourg and the bottom five were Somalia, Eritrea, Sierra Leone, Namibia and Rwanda.

According to Saliba (2013) the Kenya retail industry has managed to stay on the competitive edge through acquisition of services of skilled and experienced fourth party logistics service providers such as DHL and Kuenhe Nagel. In Kenya, some companies perform their logistics services in house while other companies outsource multiple logistics providers for their supply chain management which is not only costly to run but also cumbersome to manage.

Relationships issues, how to share resources, property rights and confidentiality of the information are some of the issues that have arisen overtime (Rao & Young, 2015). Kenya has a good number of successful companies that are known to use fourth party logistics service providers. In the public sector, companies such as East African Breweries Limited, Kenya Airports Authority, Kenya Pipeline Company use fourth party logistics to coordinate and integrate their supply chain operations.

Statement of the Problem

Changes in the business environment have forced 80% of large-scale enterprises to realign their manufacturing activities, and also to flatten their hierarchies, a short-term strategy, in order to speed up information flows (CCG, 2010). Moreover, in order to cut costs, corporations use logistics information management system to streamline operations, moving from being centralized to vertically integrated, this is a long-term strategy (KNBS, 2010). Currently, companies outsource 90% of their data centers or even large parts of their logistics processes (OECD, 2012). All these strategies have been necessitated by a situation that is of big losses, impropriety, and gross logistics mismanagement which are hampering improved and sustained performance in the industry (ISO, 2010).

Most manufacturing firms in Kenya operate at a technical efficiency of about 39% compared to their counterparts in South Africa at 71% and Malaysia at about 88% all of which is attributed to fourth party logistics and may help to close this gap. According to a report by Deloitte (2012) on manufacturing firms in Kenya, fourth party logistics saved various firms over Kshs.70 Billion in the financial year (FY) 2011/2012. According to another survey by KAM of 2011, 2012 and 2013 on the life span of manufacturing firms, the firms were winding up at notable percentage indices, fluctuating between 49%, 54% and 58% respectively; poor logistics information management system was cited as the main reason.

The manufacturing sector has always accounted for 30% of the country's Gross Domestic Product (GDP), provided employment to about 2.5 million persons in both formal and informal sectors of the economy, however they have been experiencing problems in the performance of their logistics and operations management (USAID, 2012). In Kenya, studies have reported mixed findings with regard to logistics and its influence on firm performance among manufacturing firms, for instance, a study by Mathenge and Dihel (2011) on the role of clearing and forwarding agents in reforming East Africa Community logistics sector found that firms in Kenya are faced with challenges of measuring the performance of their logistics models because they are not able to anticipate the requirements for clearing and removing the cargo from the port.

A study by Ngonela, Mwaniki and Namusonge (2014), on drivers of logistics information management system on tea processing firms in Bomet County found out that logistics information management system reduces costs, enable companies to concentrate on their core business activities, reduce risks and gain competitive advantage. While much research has focused on the problems facing logistics information management system generally in organizations in Kenya, not much research has been done to study fourth party logistics and its influence on performance of manufacturing firms in Kenya. It is against this backdrop; the present study sets out to investigate the relationship between fourth party logistics services and performance of manufacturing firms in Kenya.

Study Objectives

- i. To establish the relationship between transport management and performance of manufacturing firms in Kenya.
- ii. To determine the relationship between logistics information management system and performance of manufacturing firms in Kenya.

LITERATURE REVIEW

Theoretical Review

The Logistics Theory

This theory was first developed by Mentze (1995) in which he defined logistics as the planning, organization, and control of all activities in the transport flow, from raw material until final consumption and reverse flows of the manufactured product, with the aim of satisfying the customer's and other interest party's needs and wishes that is., to provide a good customer service, low cost, low tied-up capital and small environmental consequences (Liu & Lyons, 2011). Logistics in the manufacturing sector is also defined as those activities that relate to receiving the right product or service in the right quantity, in the right quality, in the right place, at the right time, delivering to the right customer, and doing this at the right cost.

In most of the cases freight management is seen from the perspective of an operative way of transporting or moving materials from one warehouse to another or producing service (McNichols & Brennan, 2016). The credibility of this operation is based on how good is the design of the system that leads to this kind of logistics. Freight management encompasses operative responsibilities, which include administration, operation and purchase and constructive duties as well as detailed design, examples include track and trace systems, fuel management systems and fleet scheduling and routing (Chang, 2011).

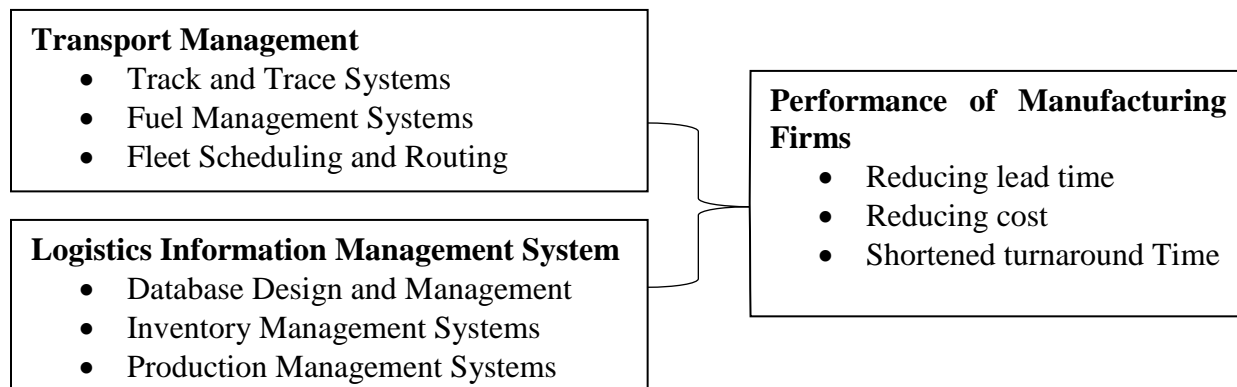
The Principal Agency Theory

The 1976 article “Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure” by Jensen and Meckling helped establish Agency Theory as the dominant theoretical framework of the supply chain literature, and position shareholders as the main stakeholder. The adoption of the agency logic increased during the 1980’s as companies started replacing the hitherto corporate logic of managerial capitalism with the perception of managers as agents of the shareholders ((Bourlakis & Bourlakis, 2015).

This theory is based on the separation of ownership and control of economic activities between the agent and the principal. Various agent and principal problems may arise including conflicting objectives; differences in risk aversion, outcome uncertainty, and behavior based on self-interest, and bounded rationality. This may for example entail an agent having a different concept of database design and inventory systems that do not concur with the principles needs.

The contract between the principal and the agent governs the relationship between the two parties, and the aim of the theory is to design a contract that can mitigate potential agency problems (Atos, 2012). Balancing the need of the shipper and the capability of the fourth party logistics provider is a well-known managerial issue that explicitly implies the risk of agency problems (Armistead & Mapes, 2013). The logistics information system management by an agent for the principle should ensure there is no misalignment between the two and a balance of rewards should be reached.

Conceptual Framework



Empirical Review

According to Thompson et al., (2011), there are four key stakeholders involved in urban freight transport: shippers; freight carriers; residents; and administrators/governments. Each group has its own specific objectives and tends to behave in a different manner and needs to be considered. Freight carriers and administrators are the media of the delivery tasks. The characteristic of their relationships is that a slight move in one part may affect the whole situation. For instance, a freight carrier with lower efficiency would impact on the service quality of the system and hence increase the difficulties of management for administrators. Besides, it would also reduce the satisfaction level of consumers and the reliability of firms and increase the operation cost.

Taniguchi et al. (2013) consider that there are three necessary targets that could be achieved by applying City Logistics: mobility; sustainability; live ability. Mobility is ease of movement,

which is the basic requirement for transport of commodities in urban areas. Goods are supposed to be delivered just-in-time. Therefore, the balance between sufficient road network capacity and reduced traffic congestion is a main issue.

The successful integration of information within an organization is a powerful enabler for reduced costs; increased productivity; and improved customer service, logistics planning and operations has been an early and extensive adopter of information technology advances due to its dependency on information for efficient operations (Wisner, 2010). Systems for order entry, order processing, electronic data interchange (EDI), vehicle routing and scheduling, and inventory replenishment are examples of early applications (Tilokavichai, 2012). Effective information technology (IT) has become absolutely necessary to support logistics processes (Samson, 2012). By automating many routine logistics activities, IT has enabled managers to focus on strategic issues and core competencies and supported the use of intermediate supply chain activities, such as distribution (Ross et al., 2012).

Logistics information system is a computer-based information system (IS) that supports all aspects of logistics management including the coordination and management of various activities such as; fleet scheduling, inventory replenishment and flow planning (Chang et al., 2012). Instead of using human analysis and relying on the accumulated experience of people, LIS supports various automated decision-making processes that produce fewer human errors and lower costs as well as more accurate results, hence increasing the overall profitability and operational efficiency of logistics management (Bauknight et al., 2015).

RESEARCH METHODOLOGY

This study adopted a descriptive design. The unit of analysis was the individual manufacturing firms while the unit of observation which defines the independent elements in a population was the heads of procurement within each of the selected manufacturing firms. Stratified sampling was then used to identify the firms that were studied. The firms were stratified according to categories (sub sectors) which are 12. In relation to the data collection procedure the study developed a timetable for data collection and scheduled appointments with the respondents, specifying in detail the date, time and place where the data was to be collected. The study used SPSS version 21 and MS Excel to facilitate the analysis of data. SPSS is used to undertake calculations on the data

RESEARCH FINDING

Response Rate

A total of 160 questionnaires were distributed to heads of procurement. Out of the population covered, 152 were responsive representing a response rate of 95%. This was above the 50% which is considered adequate in descriptive statistics according to (Dunn, 2010).

Descriptive Statistics

Transport Management

The respondents were asked to indicate their responses on influence of transport management on performance of manufacturing firms in Kenya. The results revealed that majority of the respondent with a mean of (4.13) agreed with the statement that track and trace systems plays a significant role in reducing lead time. The measure of dispersion around the mean of the

statements was 0.94 indicating the responses were varied. The result revealed that majority of the respondent as indicated by a mean of (4.27) agreed with the statement fuel management systems plays a significant role in reducing lead time. The standard deviation for was 0.968 showing a variation. The result revealed that majority of the respondent (4.55) agreed with the statement that fleet scheduling and routing play a significant role in reducing lead time. The results were varied as shown by a standard deviation of 0.5.

The average response for the statements on track and trace systems plays a significant role in attaining cost reduction was (4.22). The results were varied as shown by a standard deviation of 0.955. The average response for the statements on fuel management systems plays a significant role in attaining cost reduction was (4.4). The results were varied as shown by a standard deviation of 0.704. The result revealed that majority of the respondent with a mean of (4.46) agreed with the statement that fleet scheduling and routing play a significant role in attaining cost reduction. The measure of dispersion around the mean of the statements was 0.787 indicating the responses were varied.

The result revealed that majority of the respondent as indicated by a mean of (4.44) agreed with the statement track and trace systems plays a significant role in attaining low turnaround time. The standard deviation for was 0.786 showing a variation. The result revealed that majority of the respondent (4.21) agreed with the statement that fuel management systems plays a significant role in attaining low turnaround time. The results were varied as shown by a standard deviation of 0.942. The average response for the statements on fleet scheduling and routing plays a significant role in attaining low turnaround time was (4.01). The results were varied as shown by a standard deviation of 0.81.

The average mean of all the statements was 4.01 indicating that majority of the respondents agreed on transport management having an influence on performance of manufacturing firms. However, the variations in the responses were varied as shown by a standard deviation of 0.81. These findings imply that transport management was at the heart of the organizations. The findings agree with Lembke (2012) that using transport management in fourth party logistics is a smart move and can reduce expenses significantly.

Table 1: Transport Management

	Mean	Std. Dev.
Track and trace systems plays a significant role in reducing lead time	4.10	0.94
Fuel management systems plays a significant role in reducing lead time	4.27	0.968
Fleet scheduling and routing plays a significant role in reducing lead time	4.55	0.5
Track and trace systems plays a significant role in attaining cost reduction	4.22	0.955
Fuel management systems plays a significant role in attaining cost reduction	4.41	0.704
Fleet scheduling and routing plays a significant role in attaining cost reduction	4.46	0.787
Track and trace systems plays a significant role in attaining low turnaround time	4.44	0.786
Fuel management systems plays a significant role in attaining low	4.21	0.942

turnaround time

Fleet scheduling and routing plays a significant role in attaining low turnaround time

4.11 1.096

Average

4.01 0.81

Logistics Information Management System

The respondents were also asked to comment on statements regarding logistics information management system on performance of manufacturing firms in Kenya. The results revealed that majority of the respondent with a mean of (3.58) agreed with the statement that database design and management plays a significant role in reducing lead time. The measure of dispersion around the mean of the statements was 1.0 indicating the responses were varied. The result revealed that majority of the respondent as indicated by a mean of (3.63) agreed with the statement inventory management systems plays a significant role in reducing lead time. The standard deviation for was 0.9 showing a variation. The result revealed that majority of the respondent (3.6) agreed with the statement that production management systems plays a significant role in reducing lead time. The results were varied as shown by a standard deviation of 0.7.

The average response for the statements on database design and management plays a significant role in attaining cost reduction was (3.45). The results were varied as shown by a standard deviation of 1.2. The average responses for the statements on inventory management systems plays a significant role in attaining cost reduction was (3.5). The results were varied as shown by a standard deviation of 1.0. The results revealed that majority of the respondent with a mean of (3.61) agreed with the statement that production management systems plays a significant role in attaining cost reduction. The measure of dispersion around the mean of the statements was 0.6 indicating the responses were varied.

The result revealed that majority of the respondent as indicated by a mean of (4.17) agreed with the statement database design and management plays a significant role in attaining low turnaround time. The standard deviation for was 0.8 showing a variation. The result revealed that majority of the respondent (3.63) agreed with the statement that inventory management systems plays a significant role in attaining low turnaround time. The results were varied as shown by a standard deviation of 0.8. The average response for the statements on production management systems plays a significant role in attaining low turnaround time was (3.66). The results were varied as shown by a standard deviation of 1.

The average mean of all the statements was 3.77 indicating that majority of the respondents agreed on logistics information management system having an influence on performance of manufacturing firms in Kenya. However, the variations in the responses were varied as shown by a standard deviation of 1.134. These findings agree with Maghanga (2011) that through logistics information management system, companies can improve competitive positioning.

Table 2: Logistics Information Management System

Statements	Mean	Std. Dev.
Database design and management plays a significant role in reducing lead time	3.58	1.0
Inventory management systems plays a significant role in reducing lead time	3.63	0.9

Production management systems plays a significant role in reducing lead time	3.6	0.7
Database design and management plays a significant role in attaining cost reduction	3.45	1.2
Inventory management systems plays a significant role in attaining cost reduction	3.5	1.0
Production management systems plays a significant role in attaining cost reduction	3.61	0.6
Database design and management plays a significant role in attaining low turnaround time	4.17	0.8
Inventory management systems plays a significant role in attaining low turnaround time	3.63	0.8
Production management systems plays a significant role in attaining low turnaround time	3.66	1.0
Average	3.77	1.134

Correlation Analysis

The correlation summary shown in Table 3 indicates that the associations between each of the independent variables and the dependent variable were all significant at the 95% confidence level. The correlation analysis to determine the relationship between fourth party logistics influencing of manufacturing firms in Kenya, Pearson correlation coefficient computed and tested at 5% significance level.

The results indicate that there is a positive relationship ($r=.509$) between transport management and performance of manufacturing firms in Kenya. In addition, the study found the relationship to be statistically significant at 5% level ($p=0.000, <0.05$). The results also indicate that there is a positive relationship ($r=.398$) between logistics information management system and performance of manufacturing firms in Kenya. In addition, the study found the relationship to be statistically significant at 5% level ($p=0.000, <0.05$).

Table 3: Summary of Pearson’s Correlations

Correlations	Transport Management	Logistics Management System	Information Management System	Performance
Transport Management	Pearson Correlation 1			
	Sig.(2-Tailed)			
Logistics Management System	Pearson Correlation .263**	1		
	Sig.(2-Tailed) 0.007			
	Sig.(2-Tailed) 0	0		
Performance of Firms	Pearson Correlation .509**	.398**		1

Sig.(2-
Tailed) 0 0

** Correlation is Significant at the 0.05 Level (2-Tailed).

Regression Analysis

In this study multivariate regression analysis was used to determine the significance of the relationship between the dependent variable and all the independent variables pooled together. Regression analysis was conducted to find the proportion in the dependent variable (performance of manufacturing firms in Kenya) which can be predicted from the independent variables (transport management, logistics information management system, stakeholder relations management and product packaging and labelling).

Table 4 presents the regression coefficient of independent variables against dependent variable. The results of regression analysis revealed there is a significant positive relationship between dependent variable and the independent variable. The independent variables reported R value of .805a indicating that there is perfect relationship between dependent variable and independent variables. R square value of 0.647 means that 64.7% of the corresponding variation in performance of manufacturing firms in Kenya can be explained or predicted by (transport management, logistics information management system, stakeholder relations management and product packaging and labelling) which indicated that the model fitted the study data. The results of regression analysis revealed that there was a significant positive relationship between dependent variable and independent variable at ($\beta = 0.647$), $p=0.000 <0.05$).

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.805 ^a	.647	.633	.166295

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.027	4	1.257	66.158	.000 ^b
	Residual	2.738	147	0.019		
	Total	7.765	151			

The significance value is 0.000 which is less than 0.05 thus the model is statistically significance in predicting how transport management, logistics information management system, stakeholder relations management and product packaging and labelling influence performance of manufacturing firms in Kenya. The F critical at 5% level of significance was 36.8. Since F calculated which can be noted from the ANOVA table above is 66.158 which is greater than the F critical (value= 36.8), this shows that the overall model was significant. The study therefore establishes that; transport management, logistics information management system, stakeholder relations management and product packaging and labelling were all important fourth party logistics influencing performance of manufacturing firms. These results agree with Kazemi and Hooshyar (2009) results which indicated a positive and significant influence of fourth party logistics on performance of manufacturing firms.

Table 6: Coefficients of Determination

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.353	0.202		11.619	0.000
	Transport Management	0.158	0.045	0.232	3.546	0.001
	Logistics Information Management System	0.001	0.036	0.027	0.021	0.040

a) Predictors: (Constant), Transport Management, Logistics Information Management System

b) Dependent Variable: Performance of Manufacturing Firms

Conclusion

Based on the study findings, the study concludes that performance of manufacturing firms can be improved by transport management, logistics information management system, stakeholder relations management and product packaging and labelling.

First, in regard to product packaging and labelling, the regression coefficients of the study show that it has a significant influence of 0.183 on performance of manufacturing firms. This implies that increasing levels of product packaging and labelling by a unit would increase the levels of performance of manufacturing firms by 0.183. This shows that product packaging and labelling has a positive influence on performance of manufacturing firms.

Second in regard to transport management, the regression coefficients of the study show that it has a significant influence of 0.158 on performance of manufacturing firms. This implies that increasing levels of transport management by a unit would increase the levels of performance of manufacturing firms by 0.158. This shows that transport management has a positive influence on performance of manufacturing firms.

Recommendations

To ensure that manufacturing firms have better performance they should focus more on using their transport management so as to ascertain vendors provide fleet scheduling and routing and systems to ensure that there is consistency of goods. In the same regard, they should involve suppliers early enough to enable them to have policy and procedure.

With regard to the second objective, it would be constructive for manufacturing firms to invest more in logistics information management system to reduce the amount of time spent by staff doing non-core activities and ensure professionals spend time on core activities that give them competitive advantage.

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