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EARLY SUPPLIER INVOLVEMENT AND SUPPLY CHAIN PERFORMANCE IN FOOD AND BEVERAGE PROCESSING COMPANIES IN KENYA

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ABSTRACT

Early supply involvement is the process of engaging the supplier early enough before the orders are placed to identify the best approaches to use as both parties to meet the customer needs and reduce lead time and waiting time. This paper seeks to establish the influence of early supplier involvement on the supply chain performance of food and beverage processing companies in Kenya. Food and beverage processing companies have been at the stake of declined performance which has mainly been among other reasons as result of continued poor customer satisfaction and increased operational costs. This paper therefore seeks to assess the role played by early supplier involvement in the supply chain performance of these firms. A descriptive survey research approach was used in this study where the target population was 187 food and beverage processing companies in Kenya. A purposive sampling was used to ample 153 food and beverage processing companies in Nairobi. The heads of procurement in these companies were surveyed using a structured questionnaire. The collected data was analysed through descriptive and inferential statistics using SPSS. The findings from the study revealed that the involvement of suppliers early in designing the products and sharing with the suppliers the right information on customer specifications early reduce lead time. The study concluded early supplier involvement, process automation had a positive and significant influence of supply chain performance of food and beverage processing companies hence these companies through the management should uphold early supply involvement through sharing information with the suppliers and consulting them when designing and seeking raw materials for the production of customers' orders. The findings from this study would be significant to the supply chain practitioners, the manufacturing sector in Kenya, the policy makers and the academic and research fraternity.

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Introduction.

Background of the Study

Customers in the 21st century are placing more value on the lead time and highly selecting their suppliers based on the ability to meet shorter lead times and match their specifications. Suppliers on the other hand are trying to gain a competitive edge and improve profitability by cutting costs, increasing quality and improving lead time (Nuruzzaman, 2011). In competitive industries, short lead time will differentiate a company from its competitors, leading to increase in sales and enhanced performance (Jamshidi & Ghomi, 2015). Lead time management entails coming up with strategies and processes that are aimed at reducing the customers' waiting time to deliver the products within the shortest time possible while at the same time upholding quality and reducing costs (Bernado & Salido, 2018).

One of the strategies that modern business enterprises are upholding in order to meet customer needs and reduce lead time is through early supplier involvement (Ellram, 2015). Supplier involvement refers to the extent to which a supplier is involved in co-designing and new product development processes with their customers in exchange relationships (Sarkar, Ullah & Kim, 2017). Supplier involvement in new product development has been documented as an important factor behind successful innovation through inter-firm cooperation. Early supply involvement is therefore the process of getting into collaborations with the suppliers early before the orders are placed as a way of developing a mutual benefit approach and towards meeting the customer needs while at the same time coming up with strategies to save on costs and enhance quality.

In the product development process, the buyer can play several roles as: cataloguing suppliers technical and design expertise, foster a committed environment making suppliers more creative and risk-taking, developing stronger relationships making suppliers invest in product development capabilities, contribute to early supplier involvement and facilitating better and more consistent communication (Ruey-Jer, Sinkovics & Hiebaum, 2013; Marinagi, Trivellas, & Reklitis, 2015). In this way the early supplier involvement is able to play the coordinator between the marketing department and production with the external suppliers when new products are being specified (Diabat & Al-Salem, 2015). It has been proposed also that early supplier involvement plays an important role in managing the suppliers and supporting the R&D function (Prester, Bakaric, & Matijevic, 2014).

Food and beverage processing companies comprise of the largest portion of the manufacturing companies in Kenya (Amimo, 2013). The supply chain management of the companies is key to enhancing their continued performance and competitiveness. Food and beverages are widely used products across the country while at the same time easily substitutable. This is to mean that the lead time for these companies is way less and critical as compared to other manufacturing companies (Nyakundi, 2013). Focusing on lead time reduction through early supplier involvement would play an essential role to strengthen the reliability and customer satisfaction of the food and beverage processing companies in Kenya.

Statement of the Problem

In Kenya's big-four agenda, manufacturing is one of the items that the Kenyan government upholds as a key economic driver that ought to be enhanced for the country to achieve the vision 2030 (GOK, 2018). According to the Kenyan Association of Manufacturers (KAM), 20% of the Kenyan manufacturing industry is made up of the food and beverage processing companies. This is the biggest sub-sector in the entire manufacturing sector (KAM, 2019). Despite their significance contribution to the country's economy, the companies continue to face a wide range of challenges ranging from completion, increased globalization and increased cost of production. Most of the food and beverage processing companies in Kenya continue to operate in old production means such as centralized methods, poor distribution and supply chain frameworks and lack of proper transport mechanisms. A report by the Kenya National Bureau of Statistics (KNBS) (2017) revealed that the food and beverage manufacturing sub-sector loses more than KSh9.00Billion annually as a result of poor quality and increased defectives. The report further revealed that the food manufacturing industry was facing a steep competition from external markets with the demand of the locally produced food and beverages reducing by 7.4% between 2012 and 2016. A study by the FAO (2018) further revealed that the food and beverages exports from other East African countries to Kenya had increased by between 2.9% to 5% while the exports from Kenya of the same commodities had recorded a lesser increase. Increased lead time and poor quality as well as high prices due to high costs of operation have been blamed for decline in the performance of the food and beverage processing companies in Kenya (Kinyua, 2015; Waithaka, Mburu, Koror & Muathe, 2012). In a local context, scant literature is available on the early supplier involvement and its role on the supply chain performance of the food and beverage processing companies in Kenya. This study therefore sought to assess the influence of early supplier involvement on the supply chain performance of the food and beverage processing companies in Kenya.

Objective of the Study

i. To examine the effect of Early Supplier Involvement on supply chain performance of food and beverage processing companies in Kenya.

Research Question

i. How does Early Supplier Involvement influence supply chain performance of food and beverage processing companies in Kenya?

Scope of the Study

The paper sought to assess the influence of early supplier involvement on the supplier chain performance of food and beverage processing firms in Kenya. The study surveyed the food and beverage processing companies in Kenya. According to KAM, there are 187 food and beverage processing companies in Kenya registered under the association. Out of these, 153 firms are located in Nairobi. This is over 80% of the firms hence the study was carried out in Nairobi County.

Literature Review

Theoretical Review

The Lean Management Philosophy

Lean management is widely considered to be a philosophy that brings about such continuous improvement. The philosophy was first developed by the Japanese in the mid 50's, and is nowadays worldwide used by companies. The term "lean thinking" encompasses a set of lean practices and was first proposed by Womack *et al.* (1992). From the advent of the lean concept to the present days, the popularity of lean thinking has spread exorbitantly. Earlier applications only focused on manufacturing companies (therefore the resulting designations: lean manufacturing or lean production). The lean thinking philosophy, however, quickly moved to new areas such as services, trade and the public sector (Womack & Jones, 2003). Even with this expansion to new areas, the major use of lean thinking is still little spread among other areas.

The core concept of lean thinking is the Japanese term *muda* exemplified by the practices of Japanese motor manufacturing (Lysons & Farrington, 2012). *Muda* means waste or any human activity that consumes resources but creates no value. In the lean paradigm, activities that consume resources but generate no redeeming value in the eyes of the consumer are waste that must be eliminated (Womack & Jones, 2003). Lean Supply chain emphasizes on utilization of less time, less space, less inventory and even less money to produce products. It basically focuses on the elimination of seven types of wastes that are overproduction, waiting, transportation, inventory, defective units and over-processing.

The main objectives of implementing the lean management philosophy in an organization is improve flexibility, reduced cost, high inventory turns, shorter lead time and defect prevention. The most popular example of lean manufacturing is the Toyota Production System that attributes supply chain success to ability to achieve economies of scale in manufacturing and procurement based on small batch size production units (Holweg, 2007). Lean supply chains consider cash-to-cash cycle times as a critical measure of performance. The longer it takes to convert inventories into cash the more working capital is required and any reduction in this measure will mean the release of working capital and hence a reduction in cost (Christopher & Gattorna, 2005).

According to Dennis (2008), before the introduction of the processes outlined under the lean management philosophy, the traditional mass production had its problems including low uptake by the workers, longer lead time and waiting time as well as higher production and storage costs. But mass production could not be applied to all plants and thus, the Japanese, in particular the Toyota car factory, had to develop their own model, which would be called the Toyota Production System (lean production or lean manufacturing). Shingo (1996) cites the Toyota Production System as a process of continuous waste elimination.

Dennis (2008) defines waste with the Japanese word "*muda*", the opposite of value, which is simply what a customer is willing to pay. It is also common to see the definition of seven wastes that the lean philosophy seeks to eliminate are: a) overproduction, the largest source of waste; b) waiting time, refers to materials that are waiting in queues to be processed; c) unnecessary transportation that does not generate added value to the product; d) unnecessary processing, some operations of a process could not exist; e) inventories, their reduction will occur through their root cause; f) motion; g) defects, producing defective products means waste materials; h) manpower, handling of defective materials and others. This philosophy therefore helps in understanding how well should the supply chain be aligned in order to reduce waiting time, lead time, wastages and reduce costs of production.

The Agile Supply Chain Theory

The concept of agile manufacturing was put forward by Iaccoca Institute of Lehigh University in 1991. The agile manufacturing focuses on the ability to respond to volatile market demand both in terms of volume and variety. The origins of agility as a business concept lie in flexible manufacturing systems. Agile manufacturing is based on lead time reduction and has shown to be effective whenever product life cycles are short and market demand is unpredictable (Towill & McCullen, 1999). Lumsden (1998) argues that an agile supply chain has a high capability to flexibility adapt to the fast changing environment and hence can easily gain customer satisfaction. Yusuf et al. (1999) terms agility as the successful exploration of competitive bases of speed, flexibility, innovation proactivity, quality, and profitability through the integration of reconfigurable resources and best practices in a knowledge-rich environment to provide customer-driven products and services in a fast changing market environment. Christopher (2000) argues that leveraging supplier relations allows companies to create agile supply chains by reducing lead time between organizations. Lee (2004) emphasized that agility can help the supply chain respond to short-term changes quickly and manage the external disruptions smoothly.

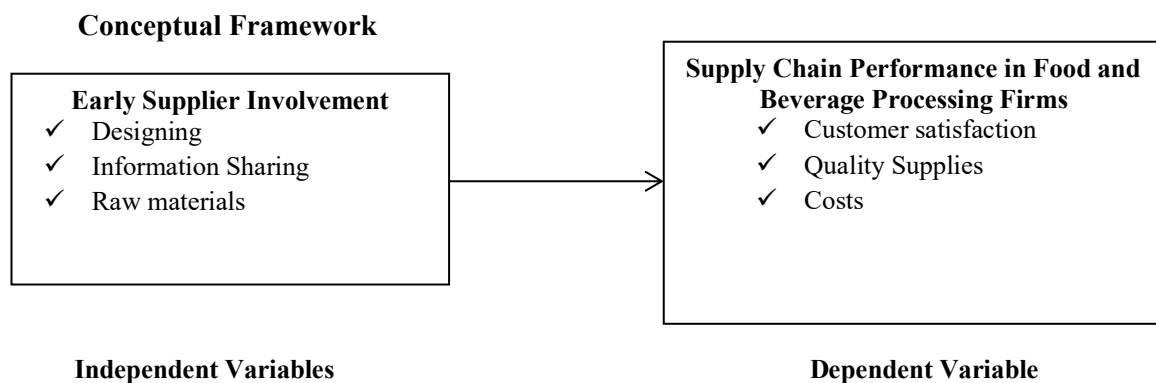


Fig. 1: Conceptual Framework

Early Supplier Involvement and Supply Chain Performance

Ellram (2015) carried out a study on the effect of early supplier involvement and procurement effectiveness in public entities in London. The study sought to assess the influence of information sharing and early sourcing of raw materials on the effectiveness of procurement in the public sector. The study adopted cross-sectional research design and had a sample of 315 respondents drawn from the state agencies in London. The findings revealed that early supplier involvement ensured that the raw materials were availed on time and that long-term relationships were established among the organizations thus steering effectiveness and efficiency. According to Ellram (2015), due to greater complexity, higher specialization, and new technological capabilities, outside suppliers can perform many activities at lower cost and with higher value added than a fully integrated company can. Supplier can have a significant impact on a manufacturer's performance, through their contributions towards cost reduction, eliminate inconsistency in the designer's manufacturing processes, minimize high-cost material items, share technical expertise and processes within each other, enabling the constant improvement of quality, share technology capabilities, and increase responsiveness of buying companies.

Euster (2016) in the study on factors affecting the performance of supply chain financing in Kenya asserts that the act of information sharing in the supply chain enables accurate and faster business decision making that translates to enhanced performance of the supply chain in terms of financing. Information sharing is essentially regarded as the bullwhip effect terminator (Fiala, 2012). This sharing of supply information essentially enhances stakeholders total cost reduction hence improving on overall chances of optimal performance of supply chain financing (Gavirneni, 2012).

Lukhoba (2015) in the study on effect of supplier development on supplier performance: a survey of food manufacturing companies in Kisumu County cited that according to a number of studies, supplier performance is measured by various criteria. She adds that several key competitive factors were broadly used to assess the supplier performance. For examples, product quality, delivery performance, price, physical distribution, services, flexibility, relationships are considered to be important factors for

measuring the supplier performance. The supplier performance improvement was used as the key indicator for the success of supplier development strategies.

Moreover, by involving suppliers in the process, buying company can access to a wide pool of talent all focused on the needs of its customers (Leenders et al., 2002). By keeping the customer-partner's future needs in mind, decisions of suppliers regarding investments, new product, new process or system could be facilitated. Thus, the possibility of misjudgement or wrong strategy made would be reduced. Hahn *et al.* (1990) proposed that suppliers involved in partnerships can carry additional inventory to satisfy the buyer's delivery requirements. This is an important feature of the buyer-supplier relationship in achieving Just-In-Time manufacturing, especially when a manufacturer (buyer) does not assist the supplier to revise its system to meet the buyer's shipment dates in a timely fashion.

Wachiuri, Waiganjo and Oballah (2015) did a study on the role of supplier development on organizational performance of manufacturing industries with specific reference to East Africa Breweries Limited in Kenya (EABL). The specific objectives are to; establish the role of training suppliers, the role of rewards, the role of financial support and role of firm involvement on organizational performance of EABL: A descriptive case study design was used. Statistical analysis was carried out using SPSS. The study reveals that rewards, financial support and firm involvement have a great role in the performance of EABL. Wachiuri, Waiganjo and Oballah (2015) subscribe that supplier development techniques involve training of suppliers, rewards, financial support and firm involvement.

Yegon, Kosgei and Lagat (2015) also investigate the effect of supplier development on buyer performance. A survey of sugar milling firms in Western Region of Kenya. Explanatory Research design was utilized to explain the cause-effect relationship between supplier development and buyer performance. A sample of 88 top level purchasing and marketing executives was selected through purposive sampling technique. Data from respondents were analyzed using correlation analysis and multiple regressions. The study finds out that supplier technical support and supplier financial support has positive effect on buyer performance. Job (2015) argues that supplies development techniques consist of supplier training programme, supplier evaluation and assessment, supplier certification/qualification, provision of financial support, supplier audits, and providing incentives and recognition.

Research Methodology

This study employed a descriptive research design. The target population for this study was the food and beverage processing firms in Nairobi, Kenya. According to Kenya Association of Manufacturers (KAM) (2018), there are a total of 187 food and beverage processing companies registered under the association. The procurement heads or their representatives in these companies were targeted as the unit of observation.

Purposive sampling was used to obtain the sample size for the study. Out of the total 187 food and beverage processing companies registered under KAM, 153 of these companies which is equivalent to 81.9% are located in Nairobi. This therefore justifies the choice of Nairobi as the locale of the study. The unit of observation comprised of one (1) procurement head/personnel from each of the companies making it a total of 153 respondents for the study. This means that the study used purposive sampling to pick both the unit of analysis (food and beverage processing firms in Nairobi County) and the units of observation (Heads of procurement/supply chain).

A structured questionnaire was used to collect the primary data for the study. The questionnaires included closed and open ended questions. The questionnaires were administered individually by the researcher to all respondents. Care and control was exercised to ensure that most of the questionnaires issued to the respondents are received.

Quantitative data was analyzed by descriptive statistics using statistical package for social sciences (SPSS). Simple regression analysis was used to test for the relationship between each individual variable and the dependent variable. The model equations were derived from the research questions as herein outlined;

What is the effect of early supplier involvement on supply chain performance of food and beverage processing companies in Kenya?

$$Y = \beta_0 + \beta_1 X_1 + e$$

Where:

Y = Dependent Variable (Supply Chain Performance)

β_0 = Constant

β_1 = Coefficient for the variable

X_1 = Independent variable (Early supplier involvement)

e = Error term

Research Findings

Response Rate

A response rate of 81.2% (124 respondents) was obtained out of the sample size of 157. This was considered adequate for analysis.

Descriptive Analysis of Early Supplier Involvement

The study sought to establish the influence of early supplier involvement on supply chain performance in food and beverage processing firms. The study sought to find out the respondents' level of agreement on specific statements regarding the role played by early supplier involvement on supply chain performance. The findings are as shown in Table 1. From the findings, it can therefore be deduced that while early supplier involvement is done among the surveyed food and beverage manufacturing companies, the engagement was not centrally based on meeting customer needs and reduce lead time but majorly to ensure continued business between the suppliers and the organization and this could affect the supply chain performance. The findings are in line with those by Ellram (2015) who found out that through continued involvement of suppliers early enough before the customer's request for the supplies enhances proper collaboration towards meeting the tastes and preferences of the customer. Xue and Ge (2018) suggest that the procurement personnel should be speedy enough to forecast the future needs of their customers thus involving the suppliers early to come up with better ways to meet the customer expectations.

Table 1. Level of agreement with statements on Early Supplier Involvement

Statement	Mean	Std. Dev.
We adequately involve our suppliers in designing of the products based on the customer specifications	3.11	1.37
Our suppliers are committed towards designing the products to meet the needs of our customers	3.05	1.42
We offer the suppliers the designs required by our customers early enough for them to meet the need of the customers	3.58	1.26
We adequately and readily share information with our suppliers on what is required of them early enough before the need arises	3.42	1.33
There are frequent meetings with our suppliers to deliberate on our continued relationship	3.68	1.17
We have an active platform for sharing information with our suppliers	3.64	1.23
The raw materials are order early enough based on the forecasts of the customer needs	3.84	1.07
Our suppliers are maintained to ensure prolonged relationship and timeliness in supplies	3.61	1.23
Through early supplier involvement the supply chain performance and lead time are achieved	3.80	1.18

Supply Chain Performance

The study sought to establish the supply chain performance of the food and beverage processing companies in Kenya. The findings are shown in Table 2. The findings imply that most of the food and beverage processing firms upheld quality supplies more than cost saving and cost saving more than customer satisfaction. According to Ellram (2015), supply chain performance ought to be upheld on the

perspectives of meeting customer needs and ensuring that the needs are satisfactory to the customers' perspective not only to the organization's perspective. The findings further imply that through lead time management, the companies enhanced customer satisfaction, quality supplies and cost-saving all which are aspects of supply chain performance.

Table 2. Level of Agreement with Statements on Supply Chain Performance

Statement	Mean	Std. Dev.
The company has continually met the customer needs in terms of timeliness thus enhancing their satisfaction	3.45	1.40
Our customers are always willing to do business with us and also refer others	3.91	1.04
We have embraced consistency in the production to maintain high quality of our supplies	3.75	1.18
The distribution of our products is effectively done to minimize on poor quality on transit	3.60	1.41
The costs of managing inventories have reduced in our company due to focus on lead time management	3.51	1.30

Inferential Analysis on Early Supplier Involvement

The study sought to find out the statistical relationship between early supplier involvement and supply chain Performance in Kenya. The model for the variable was:

$$Y = \beta_0 + \beta_1 X_1 + e.$$

The results are as shown in Table 3. The model summary revealed that the coefficient of determination (R^2) which shows the degree of association between early supplier involvement and supply chain performance of food and beverage processing companies was 0.578. The R^2 reveals that 57.8% of the variation in supply chain performance among the food and beverage processing companies is as a result of early supplier involvement.

ANOVA analysis was also conducted in the study. The output is as presented in table 3 and it revealed that the F-statistic was 405.816 at a significant level of 0.000. This implies that early supplier involvement can significantly predict the supply chain performance of the food and beverage processing companies in Kenya.

The regression coefficients results revealed that the Beta coefficient of early supplier involvement was 0.657 which means that a unit change in early supplier involvement can explain up to 65.7% of supply chain performance in food and beverage processing companies. The p-value for the variable was 0.000 which is lower than the standard p-value of 0.05 implying that early supplier involvement is significantly and positively related to supply chain performance. The findings are in line with those by Bernado and Salido (2018) who indicated that in order for modern businesses to reduce lead time, involving suppliers early was necessary to avoid delays and also promote more collaboration with the suppliers towards meeting the customer needs.

Discussion

The study sought to examine the influence of early supply involvement on the supply chain performance of food and beverage processing firms in Kenya. The study established that most of the companies surveyed did not effectively uphold involvement of suppliers in design the products based on the specifications by the customers and that the suppliers were not committed towards developing product designs that met the needs of the customers. This is an implication that this could be the reason as to why customer dissatisfaction is high. The food and beverage processing firms however were found to be committed to enhancing the customer needs through early supplier involvement by giving suppliers the design preferences by the customers and conducting frequent meetings with the suppliers to address the concerns by the customers.

Table 3. Inferential Analysis Results

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762 ^a	.580	.578	.51006

a. Predictors: (Constant), Early supplier Involvement

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	105.576	1	105.576	405.816	.000 ^b
	Residual	76.486	122	.260		
	Total	182.062	123			

a. Dependent Variable: Supply Chain Performance
 b. Predictors: (Constant), Early supplier Involvement

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.419	.118		11.980	.000
	Early supplier Involvement	.657	.033	.762	20.145	.000

a. Dependent Variable: Supply Chain Performance

Conclusions

Early supplier involvement has a significant and positive influence on the supply chain performance of food and beverage processing companies in Kenya. The study concludes that supplies in most of the food and beverage processing companies are not effectively engaged where they are not given the customer designs early enough and the right information shared regarding the customers' specifications and this could affect the supply chain performance.

Recommendations

The procurement departments in the food and beverage processing companies have the duty to ensure that the product designs and customer specifications are met. This is best achieved through involving the suppliers early. The procurement personnel ought to involve suppliers early in product designing, sharing information and obtaining the raw materials so as to ensure that by the time the customers' order, the raw materials and other supplies are already available to avoid longer lead-times.

REFERENCES

1. Amimo, E. (2013). Location Decisions By Food Manufacturing Firms In Kenya. University of Nairobi, Nairobi, Kenya. Retrieved from: <https://pdfs.semanticscholar.org/25d4/19ad017a6ecd61863cc3ad0fe0630c18dfa2.pdf>
2. Bernado V. and Salido, L. (2018). Improving Order Lead Time: A Case Study. *Journal of Development Economics*, Vol 60, pp105-141.
3. Christopher, M., & Gattorna, J.(2005).Supply chain cost management and value-based pricing. *Industrial Marketing Management*, 34(2): 5-121
4. Dai, B., & Chen, H. (2012). Profit allocation mechanisms for carrier collaboration in pickup and delivery service: *Computers & Industrial Engineering*, 3(3), 45-52.

5. Diabat, A. & Al-Salem, M. (2015). An integrated supply chain problem with environmental considerations. *Int. J. Prod. Econ.*, 64, 330–338
6. Ellram, L.M. (2015). Early Supplier Involvement and Procurement effectiveness in Public Entities in London. *European Journal of Purchasing & Supply Management* ;3(1):21–31.
7. Gohary, A., Hamzelu, B., Pourazizi, L., & Hanzae, K. H. (2016). Understanding effects of co-creation on cognitive, affective and behavioral evaluations in service recovery: An ethnocultural analysis. *Journal of Retailing and Consumer Services*, 31, 82-198.
8. Jamshidi, R., & Ghomi, S.M.T. (2015) Flexible supply chain optimization with controllable lead time and shipping option. *Applied Soft Computing Journal*. Vol 30, issue 2, p. 26-35.
9. Job, M. K. (2015). *Supplier Development and Operational Performance of Manufacturing Firms in Nairobi City County*. MBA Thesis of School Of Business University of Nairobi.
10. Kirui, E. C., & Makau, G. K. (2015). Effect of Lead Time on the Efficient Delivery of Essential Drugs in Kenya: A Case Study of the Kenya Medical Supplies Authority. *International Journal of Science and Research (IJSR)*, 5(10); 036-1047.
11. Lee, Y., Chen, A. N., & Ilie, V. (2012). Can Online Wait Be Managed? The Effect of Filler Interfaces and Presentation Modes on Perceived Waiting Time Online. *MIS Quarterly*, 36(2), 365-394.
12. Lukhoba, E. J., & Muturi, W. (2015). Effect of Supplier Development on Supplier Performance: A Survey of Food Manufacturing Companies in Kisumu County. *International Journal of Economics, Commerce and Management*. 3(11), 46 – 60.
13. Marinagi, C., Trivellas, P., & Reklitis, P. (2015). Information quality and supply chain performance: The mediating role of information sharing. *Procedia-Social and Behavioral Sciences*, 75, 473-479.
14. Mfwaya, J. L. (2013). *Lead Time Management and Customer Satisfaction in the Telecommunication Industry in Kenya*. University of Nairobi, Nairobi Kenya
15. Ndubi, S.O., Iravo, A.M., Ochiri, G. (2016).Effect of Lead Time Variability on Inbound Logistics Performance in Safaricom Limited. *International Academic Journal of Procurement and Supply Chain Management*, 2(2), 79-205.
16. Nuruzzaman, M. (2011), "Lead time reduction and the application of Process Management- on Safety Stocks. Decision Sciences Volume 35 Number Performance through Enterprise Logistics Management, *Oliver Wight, Brattleboro, VT*. pp. 29-31. P-63
17. Nyakundi, M. (2013).Adoption of green manufacturing practices by food processing firms in Mombasa county, Kenya (unpublished MBA thesis). University of Nairobi.
18. Nyamasege, O. J., & Biraori, O. E. (2015). Effect of supplier relationship management on the effectiveness of supply chain management in the Kenya public sector. *International Journal of Managing Value and Supply Chains*, 6(1), 25.
19. Potter, A., Towill, D., & Christopher, M. (2015). Evolution of the migratory supply chain model. *Supply Chain Management: An International Journal*, 20(6), 603-612.06- 2015-0231
20. Prester, J. Raslic Bakaric, I., Matijevic, B. (2014), Organisation of the Purchasing Function for Innovation, *International Journal of Social, Education, Economics and Management Engineering*, 8 (11), 3367-3373.
21. Ruey-Jer, B. J., Sinkovics, R., R. and Hiebaum, T. (2013). The effects of supplier involvement and knowledge protection on product innovation in customersupplier relationships: A study of global automotive suppliers in China," *Journal of Product Innovation Management*,
22. Sarkar, B.; Ullah, M. & Kim, N. (2017). Environmental and economic assessment of closed-loop supply chain with remanufacturing and returnable transport items. *J. Comput. Ind. Eng.*, , 48–163
23. Shingo, S.(1988): *Non-stock Production*, Productivity Press, Cambridge
24. Towill, D. R. & McCullen, P. (1999). The impact of agile manufacturing on supply chain dynamics. *International Journal of Logistics Management*, 10(1): 83-96.
25. Virbahu N. J. (2019)., Artificial Intelligence (AI) for Supply Chain Industries and the Future It Holds!, *International Journal Of Engineering Research & Technology (Ijert)* Volume 08, Issue 03.
26. Wachiuri, E. W., Waiganjo, E. & Oballah, D. (2015). Role of supplier development on organizational performance of manufacturing industry in Kenya: A case study of East African Breweries Limited. *International Journal of Education and Research*. 3(3), 683-694.
27. Waithaka, S.T., Mburu, T.M., Koror, J., & Muathe, S. (2012). Environmental Factors that influence Supply Chain Management Implementation in the Manufacturing Industries in Kenya: A Case of Manufacturing Industries in Nairobi, Kenya. *ABC Journal of Advanced Research*,1 (2),1-8.
28. Womack, J. P. & Jones, D. (2003) *Lean Thinking*. Revised and updated. Free Press.
29. Womack, J. P., Jones, D. T., & Roos, D. (1992). *A máquina que mudou o mundo* (14. ed.). Rio de Janeiro: Campus
30. Xue, Y. & Ge, L. (2018). Cost Optimization Control of Logistics Service Supply Chain Based on Cloud Genetic Algorithm. *Wirel. Person. Commun.*, 02, 3171–3186.
31. Yegon, J. Kosgei, D. K & Lagat, C. (2015). Effect of supplier development on buyer performance: A survey of sugar milling firms in Western Region of Kenya. *European Journal of Logistics, Purchasing and Supply Chain Management*. 3(3), .35-54.