

# Effects of Inventory Control System on Supply Chain Performance in Distribution Firms in Kenya: A Case of Bollere Africa Limited

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**Abstract:** Inventories constitute a significant proportion of current assets in distribution firms; therefore, it is necessary that inventories must be controlled efficiently and effectively in order to avoid unnecessary investment of funds and thereby to improve the firm's performance. Distribution firms are constantly seeking to improve their inventory control system in order to stay afloat in business and stay clear from extensive competition from their competitors. Supply chain performance is achieved through a proper inventory control system; when the firm is able to meet end customers' needs associated with ensuring the availability of product, delivering it on time in the right way and ensuring appropriate inventory level. This study therefore sought to examine the effect of inventory control system on supply chain performance in distribution firms in Kenya. The study was a case study research design as it places more emphasis on the full contextual analysis of fewer events and their interrelation. The target population of the study consisted of staff from the four distribution centers in Nairobi (Mugoya, Kenroid, BDC and SDV Transami). The study adopted stratified random sampling as a sampling technique in selecting the sample data. Data collection instruments were structured questionnaires to collect primary data. The study also made use of secondary sources of data. Data was analyzed using SPSS version 21. Findings were presented in form of tables, graphs, charts and figures followed by interpretation and discussion of the findings. Afterwards, conclusions and recommendations were drawn. Correlation analysis was employed to know the relationship between variables. Multi linear regression results have those four predictors can explain 65.61% of change in supply chain performance. Following the results of the study it's worthwhile to conclude that there is a positive and significant relationship between inventory control system and supply chain performance in distribution firms through staff competence, order size, customer service level and lead time. Further research study can be conducted in other distribution firms and other sectors of the economy to establish if inventory control system has an effect on supply chain performance. The study recommended that distribution firms should embrace inventory control system so that they reap from immense benefits accrued from an efficient and effective system, it should also be encouraged to attain supply chain performance.

**Keywords:** avoid unnecessary investment of funds, Distribution firms.

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## 1. BACKGROUND OF THE STUDY

Inventories constitute a significant proportion of current assets in a majority of companies. The large size of inventories blocks a considerable amount of the companies' funds. It is therefore necessary that inventories must be controlled efficiently and effectively in order to avoid unnecessary investment of funds and thereby to improve the firms' profitability. Firms invest a portion of their capital on their fixed and current assets, and a large portion which is invested on current assets is inventory and thus it requires for efficient management (Bose, 2006). Organizations that keep too much inventory in their warehouse operate an inefficient supply chain, while those that keep minimal inventories in their warehouse are being efficient (Lai and Cheng 2009).

There are several reasons for keeping inventory. Too much stock could result in funds being tied down, increase in holding cost, deterioration of materials, obsolescence and theft. On the other hand, shortage of materials can lead to interruption of products for sales; poor customer relations and underutilized machines and equipment (Buffa and Salin 1987).

Inventory plays a big part in firms as it accounts for about 56% of the annual turnover (Ondiek, 2006). Organizations are faced with a lot of competition in the current markets, this has led to the need for coming up with better methods of controlling inventories and therefore be able to eliminate any wastage in the value chain (Ondiek, 2006). In this case, the major concern is how inventory functions are organized and who is responsible over these functions in the Kenyan logistics firms.

According to Dobbler and Burt (2006), inventory alone account for as much as 30% of the organization invested capital. Inventory control enhances profitability by reducing costs associated with storage and handling of materials (Lyson, 1996).

Inventory control is an important concern for managers in all types of businesses. The challenge isn't to pare inventories to the bone to reduce costs or to have plenty around to satisfy all demands, but to have the right amount to achieve the competitive priorities for business most efficiently (Krajewski and Ritzman 1999).

The research done by Holdren and Hollingshead (1999) in the United States of America witnesses that much of the \$ 700 million worth of inventory held by American businesses is financed by bank loans with the goods pledged as security. An important industrial marketing relationship exists between inventory managers and commercial lending officers who write these inventory loans. Inventory managers need to provide their lenders with sufficient information to obtain financing at the lowest rate. Loan officers need to assess the degree of inventory risk in order to assign a proper interest rate. Issues of risk and return of inventory loans are matters of concern for both inventory managers and creditors

Inventory control defines how often inventory levels are reviewed to determine when and how much to order. It is performed on either a perpetual or a period basis. Clodfelter (2003) adds that the control system allows you to determine mistakes that have been made or identify areas that need your immediate attention. To be most effective, the inventory control system must also provide information in a timely manner to allow you to make decisions while problems can still be corrected.

Dysney and Towill (2003) Two models are usually used to control inventories: Perpetual review and periodic view.

A perpetual inventory control process reviews inventory status daily to determine inventory replenishment needs. To utilize perpetual review, accurate tracking of all Stock-Keeping Units is necessary. Perpetual review is implemented through a re-order point and order quantity. The formula for calculating the perpetual review re-order point is;

$$ROP = DXT + SS$$

Where:

ROP= Re-order point in units D= Average daily demand in units T= Average performance cycle length in days; and SS= Safety or buffer stock in units.

Periodic inventory control reviews the inventory status of an item at regular time intervals such as weekly or monthly. For periodic review, the basic re-order point must be adjusted to consider the extended intervals between reviews. The formula for calculating the periodic review re-order point is:

$$ROP = D(T + P/2) + SS$$

Where:

ROP= Re-order point T= Average performance cycle length D= Average daily demand P= Review period in days, and SS= Safety stock.

### **Bollere Africa Transport and Logistics (Kenya):**

Bollere group is a French company headquartered in Puteaux, on the western outskirts of Paris France. Bollere group operates in Africa since 1927. In 2008, Bollere Africa logistics was established to consolidate the Bollere group

infrastructure and logistics activities across the African continent (The Financial Times, 2008). Bollore Transport and Logistics is present in 56 countries including 46 in Africa.

Bollore Africa Logistics (Kenya), with its headquarters in Nairobi, was previously known as SDV Transami. As of January 1, 2016, it changed its name to Bollore Africa Transport and Logistics, became a full subsidiary of the Bollore group. The logistics activities include haulage, industrial project logistics, heavy lift, rail transport, air transport, barging, port handling, shipping customs formalities, supply chain and warehouse management. Bollore has two other branches, one in Kisumu and the other one in Mombasa. The Nairobi branch has four distribution warehouses i.e. Kenroid, Transami/HQ, Bollore distribution center and Mugoya.

Bollore Transport and Logistics (Kenya) began working as the new warehouse service provider for EABL on September 1 2016 taking over from DHL, which had been on contract with EABL for more than 15 years. Bollore, which was one of EABL's long standing transporters, took up the role of warehousing of a facility of more than 20, 000 square metres commissioned by EABL.

Bollore is mandated with handling all beer, UDV and keg products when they leave the production line, oversee storage at the warehouse and dispatch onto transporters trucks for delivery to distributors. Bollore also receives empties (keg barrels and bottles) from the trade (distributors' depots) department and feed the production line.

A good number of studies have been conducted on inventory control and management on various organisations. Kariuki (2013) did an assessment of the factors influencing effectiveness of inventory control in the Ministry of State for Provincial Administration and Internal Security in Nairobi, the study found that long bureaucratic procedures, staff qualification and unavailability of appropriate stock records are the main factors influencing effectiveness of inventory control in the institution. The study did not address utilization of efficient inventory control system to gauge supply chain performance. Gakinya (2013) did a study to establish the relationship between inventory management techniques and supply chain performance in the agricultural sector in Kenya. The study concluded that the sector is embracing implementation inventory management techniques and in deed it has a relationship with supply chain performance. Waweru (2010) did a study on the effects of inventory levels and stock outs on procurement performance at Kenya Forestry Research Institute. The study concluded that management support is crucial in implementing inventory control techniques. Agius (2015) did a study to evaluate the stock control systems of Maltese supermarkets, in Europe. The study concluded that in a case where an organization holds different kinds of inventory appropriate method should be used for specific items. However, these studies did not address the effect of inventory control system on supply chain performance in distribution firms, therefore, creating a knowledge gap which necessitates this study.

## **2. LITERATURE REVIEW**

### **The Knowledge-Based Theory:**

The knowledge-based theory of the firm considers knowledge as the most strategically significant resource of the firm. Its proponents argue that because knowledge-based resources are usually difficult to imitate and socially complex, heterogeneous knowledge bases and capabilities among firms are the major determinants of sustained competitive advantage and superior corporate performance (Grant 2007). This knowledge is embedded and carried through multiple entities including organizational culture and identity, policies, routines, documents, systems, and employees (Zander 2007). The knowledge-based theory determines the nature of the organization human resources capabilities which are mostly influenced by staff competence. Existence of professional trained staff on inventory control systems and availability of staff with high level of integrity plays an important role in strengthening the organization capabilities to perform. The study thus used this theory to establish how staff competence effectively and efficiently increases performance of the firm.

### **Resource Based View theory:**

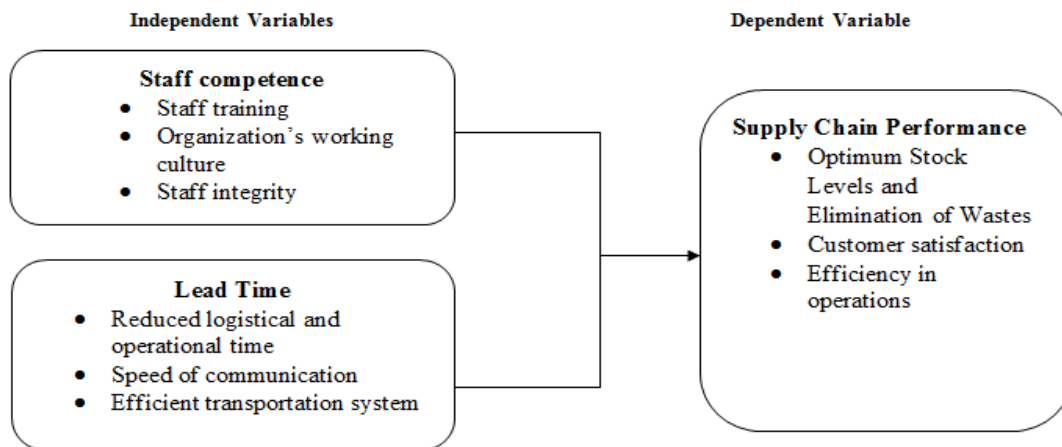
The resource based view of the firm (RBV) draws attention to the firm's internal environment as a driver for creating high performance and emphasizes that if a firm utilizes its resources and capabilities well it will have a competitive advantage. One of the key insights of the resource-based view is that not all organizational resources are a potential source of high performance (Hitt, 2011). However, in order to be competitive, resources must be valuable by being capable of creating a good customer service: allowing the firms to implement strategies that will enable it to meet customer's needs more efficiently and effectively, rare and in high demand (Sampurno, 2010).

Resource Based View approach is useful in employing various systems in controlling inventories in the organization through optimal utilization and allocation to improve on performance (Sulastrri (2006). Companies perform well whenever customers consistently perceive positive differences such as in quality, uniqueness value or cost competitiveness between the products or services offered by the company and those of its competitors. (Hitt et al 1997). Managers have to make an overall assessment of the firm’s resource base. The source of high organizational supply chain performance lies mainly in how it exploits its resources to offer an excellent customer service. Good customer service leads to loyal and trusting customers. According to RBV a firm can create value through its internal resources and capabilities. Value can be created from customer relationship management.

**Theory of constrains:**

The theory of constraints (TOC) is an overall management philosophy introduced by Eliyahu Goldratt in his 1984 book titled ‘The Goal’ that is geared to help organizations continually achieve their goals. The Theory of Constraints is a methodology for identifying the most important limiting factor (constraint) that stands in the way of achieving a goal(supply chain performance) and then systematically improving that constraint until it is no longer the limiting factor (Godratt, 2002).In inventory control the difficulties in the theory of constraints are: very long lead times, large number of unfulfilled orders, high level of unnecessary inventories or lack of relevant inventories, conflict of scheduling resources (Fawcett, 2009). The theory of constraints thus emphasizes on focusing effectively on managing the capacity and capability of staff, customers’ engagement and frequently prioritizing orders, this improves the operational performance of their organization (Umble,2006). Theory of constraints minimizes investment in stock and allocates resources optimally through use of various inventory control techniques or systems to achieve optimal inventory levels (Yugang, 2009). According to Theory of Constraints, problems are likely to raise when inventory is not tracked properly, stock outs occur, critical equipment locations are uncertain, poor record management, unskilled personnel handling inventory etc. all this leads to low supply chain performance. The study uses this theory to establish the effect of lead time and order size on supply chain performance in distribution firms in Kenya.

**Conceptual framework:**



**3. RESEARCH FINDINGS AND DISCUSSIONS**

**Effect of Staff Competence on Supply Chain Performance**

In order to make sense of the data obtained, cross tabulation based on percentages were used. Table 1 shows percentage of participants who reported on the effectiveness of staff competences in the performance of supply chain at Bolllore Ltd.

**Staff Competence:**

**Table 1**

Effect staff competence on supply chain performance	Disagree	Neutral	Agree	Strongly agree
Staff training	8.9%	14.6%	41.7%	34.8%
Organization’s working culture	8.3%	24.2%	28.8%	38.7%
Staff integrity	0.0%	4.1%	48.7%	47.2%

Source: Author, 2017

From the results, 8.9% of the staff at Bollore Ltd disagreed with the proposition that staff training improves supply chain performance. Further, 14.6% reported not observing any effect of staff training improve supply chain performance. However, 41.7% and 34.8% agreed and strongly agreed respectively that staff training improves supply chain performance. In general, 76.5% (41.7 + 34.8) of the participants reported that staff training affects supply chain performance.

8.3% and 24.2% of the participants disagreed or were neutral respectively concerning the effect of working culture on improving supply chain performance in the organization. However, 28.8% and 38.7% of the participants agreed and strongly agreed respectively that working culture greatly affect supply chain performance. From the results, the observation is that 67.5% of the participants believe that the organization’s working culture affect the performance of supply chain in the company.

From table 2 above, 4.1% of the staff reported that staff integrity does not affect performance of supply chain in the organization. However, 48.7% and 47.2% of the staff agreed and strongly agreed respectively that supply chain performance heavily depends on the integrity of the staff. Generally, 94.9% of the participants indicated that in order to improve supply chain performance then, the staff must be of high integrity. Therefore, from the analysis competence of the staff members plays a significant influence on supply chain performance.

**Effect of Lead Time on Supply Chain Performance:**

The literature review chapter outlined several studies that asserted that lead time improves supply chain performance of an organization. In an attempt to support or decline the results reported in the previous studies, the researcher carried out quantitative research using five step Likert questionnaires. The results obtained from the census are outlined in the table below.

**Lead Time:**

**Table 2**

<b>Effect lead time on supply chain performance</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>
Reduced logistical and operational time	12.0%	72.4%	15.6%
Speed of communication	8.8%	22.5%	68.7%
Efficient transportation system	0.0%	88.3%	11.7%

*Source; Author, 2017*

The results indicate that 12.0% of participants were not sure on the effect of lead time in terms of reduced logistical and operational time on performance of supply chain in Bollore Africa Ltd. However, 72.4% and 15.6% of the staff agreed and strongly reduced logistical operation time greatly improves the performance of supply chain in the organization. Besides, 8.8% of the staff believed that speed of communication does not improve or decline the performance level of supply chain in Bollore Africa Ltd. However 22.5% and 68.7% of the participants agreed and strongly supported the proposition that speeding communication in the organization improves supply chain performance. Finally, 88.3% and 11.7% of the staff agreed and strongly agreed that Bollore Africa Ltd has an efficient transportation system which has enabled them perform better in supply chain.

**4. SUMMARY, CONCLUSION AND RECOMMENDATIONS**

**Summary of findings:**

The study sought to ascertain the effects of inventory control system on supply chain performance in distribution firms in Kenya a case of Bollore Africa Transport and Logistics. The specific objectives that guided the study is to establish the influence of staff competence on supply chain performance, to examine how order size affect supply chain performance, to examine the extent at which customer service level affects supply chain performance and to establish the effect of lead time on supply chain performance. The study employed a case study research design to achieve its objectives.

The study population comprised of 1500 warehouse staff of BTL and specifically in four distribution centers in Nairobi i.e. Mugoya, Kenroid, BDC and SDV Transami. The study used stratified random sampling technique. The sample size was 94 respondents achieved by use of Naisuirma (2000) formula. Structured questionnaires containing close-ended questions were used to collect primary data for this study. The questionnaires were distributed using drop and pick later

method to the respondents. A pilot study was carried out among BTL staff who did not take part in the main study to check validity and reliability of the data. Data collected was analyzed using descriptive and inferential analysis method. A linear regression analysis was used to analyze the effect of staff competence, order size, customer service level and lead time on supply chain performance. SPSS version 21 was used to aid in data analysis. Data analysis results were presented using charts, graphs and tables. Multi linear regression results have shown that four variables can explain 65.61% of change in supply chain performance; namely staff competence, order size, customer service level and lead time.

#### **Staff competence on supply chain performance:**

The findings of the study revealed that post employment formal training was not a common means for preparing staff before deployment to inventory control section at BTL. The findings showed only few staff involved in inventory control have undertaken a formal post-employment training in different aspects and when it happens it doesn't lead to formal certificate despite being reported as very essential in ensuring high performance.

The current organization culture at BTL is not effective in that ; there was delays in operations that was indicated in the turnaround time, non- reliance of data captured in the system hence compromising on data integrity and security, accumulating data to be posted leading to an increased likelihood of posting incorrect entries, indirect violation of inventory control regulations due to late entry, failure to have compliance team to keenly monitor stock movements physically and in the system, issuing without accompanying all the required documents and misplaced documents, the respondents reported this to be an attributing factor for theft and pilferage.

The results revealed that staff competence affect supply chain performance at BTL. The results have also shown that staff competence positively and significantly affect supply chain performance at BTL.

#### **Lead time on supply chain performance:**

The findings of the study revealed that BTL is working on efficiency in operations by having TAT reports circulated after every two hours; they are efficient in communication and transportation system; long lead times are experienced because custom clearance at the port takes pretty much time than expected hence experiencing long lead time.

The results revealed long lead time has an effect on supply chain performance at BTL. The results have also shown that lead time positively and significantly affect supply chain performance.

#### **Conclusion:**

Following the results of the study it is worthwhile to conclude that there is a positive relationship between inventory control system and supply chain performance through staff competence, order size customer service level and lead time. BTL has been able to achieve supply chain performance through inventory control.

From the findings, the study concludes that staff competencies affect greatly supply chain performance at BTL. Hence employees need to acquire core competencies like knowledge, skills, experience and abilities to enhance supply chain performance in distribution firms in Kenya. The study also concludes that organizational working culture affects supply chain performance at BTL because factors like attitudes of staff towards work, how rules and policies are implemented has a great impact on performance.

The study concluded that BTL did not embrace modern technology in doing demand and supply forecast hence improved anticipation of future developments in distribution firms in Kenya is required thus they should invest in technologies that forecast demand and supply accurately.

The study concluded that supply chain performance can be achieved through customer service level and can be done by consistent performance to the customers, understanding customer expectations and willingness and readiness of the employees to give immediate service to the customers. The study also concluded that lead time has a positive effect on supply chain performance through reducing of logistical and operational time, speed in communication and use of an efficient transportation system. The study further concluded that an inventory control system is a competitive tool in the organization for realizing its corporate competitive strategy.

#### **Recommendations:**

The analysis undertaken in this study reveals that a number of steps can be taken to improve inventory control system to increase high supply chain performance in distribution firms in Kenya. The following recommendations can be drawn from the findings and analysis:

**Staff competence:**

The study showed that staff competence affects supply chain performance, therefore the management of BTL should give formal post-employment training to all the inventory control staff because training equip employees with relevant knowledge and skills to work effectively and efficiently hence high performance and also they need to instill a strong organizational culture because it is a talent attractor, a talent retainer, it engages the view of work, it creates synergy and it makes everyone more successful. Staff integrity should be encouraged all the time because it helps the employees to make the right decisions. The management also needs to ensure proper stores records management because helps in giving authentic and reliable information and has an impact on supply chain performance.

**Lead time:**

Operations in distribution firms should be reviewed regularly to eliminate any loopholes that might hinder high supply chain performance. The management of distribution firms should adopt efficient transportation systems because it helps in meeting deadlines and they should embrace high speed in information sharing to increase productivity.

**Areas for further research:**

The study is a milestone for further research in the field of inventory control systems in Africa and particularly in Kenya. The findings of the current study should be expanded further in future in order to establish whether the explored factors can be generalized to affect inventory control system on supply chain performance. The study was not exhaustive by any means because different sectors of the economy also have inventories, it is therefore recommended that another study be replicated in other sectors of the economy e.g. agriculture, manufacturing etc.

Further research can be done on inventory control systems and methods that needs to be eliminated in distribution firm in order to improve performance another one on the effect of accurate demand and supply forecast on supply chain performance and finally the effect of inventory control training on supply chain performance in distribution firms.

**REFERENCES**

- [1] Agus,N. (2006). *Supply Chain Management and performance an empirical analysis*. A working paper university of Malaysia.
- [2] Armstrong Stassen, M. (2008). *Human Resource Management Journal*, Organisational practices and the post retirement employment experience of older workers. 18(1), 36-53.
- [3] Bachetti, A., Plebani, F., Saccani, N. and Syntetos, A.A. (2010). *Spare Parts Classification and Inventory Management: a case study*. *Global Thinking, Sustainable Practice, Professional Success*. University of Salford. Manchester: Salford Business School.
- [4] Bertolini m & Rizzi a. *A simulation approach to manage finished goods inventory Replenishment economically in a mixed push / pull environment*. Volume 15. Number 4. 2002:1-2.
- [5] Berling, P. (2011), *A Characterization of optimal Base-Stock levels for a Continuous Stage Serial Supply Chain* IESE Business School. University of Navarra.
- [6] Bose, D.C., 2006. *Inventory Management*. [e-book] PHI Learning Pvt. Ltd. Available at: Google Book <[https://books.google.com/books?id=9E146G0f6agC&printsec=frontcover&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.com/books?id=9E146G0f6agC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)>
- [7] Brewer, P.C & Speh, T.W. (2000). *Using the Balanced scorecard to Measure Supply Chain performance*. *Journal of Business Logistics*. (12), 78-80
- [8] Brink, A. and. B. (2008). *Relationship Marketing and Customer Relationship Management*. In: *Relationship Marketing and Customer Relationship Management*. Cape Town: Juta, p.56.
- [9] Buffa, E., & Sarin, R. (1987). *Modern Production and Operations Management*, (8th ed). New York: John Wiley and Sons.
- [10] Cachon, G. & Terwiesch. (2006), *Matching supply with Demand, An Introduction to Operations Management*. McGraw-Hill. New York

- [11] Cacioppo, N. (2005). *Measuring and managing customer satisfaction*. London: Prentice Hall, international academic journal.
- [12] Carter, R.J., & Price, P.M. (1993). *Integrated material management*. London: Pitman.
- [13] Coe, C. K. (1989). *Public Financial Management*. Englewood Cliff (NJ): Prentice Hall
- [14] Colburn, R. (2013), “*Determining the Effect of Return management Experience on Customer Satisfaction*”, University of Tennessee Honors thesis project
- [15] Cooper, D. (2008). *Business Research Methods*. London: McGraw Hill.
- [16] Cooper, D.R., & Schindler, P.S. (2006) *Business Research Method*, (9th Edition)
- [17] Boston: McGraw-Hill Irwin.
- [18] Clodfelter R. 2003. Retail buying from basics to fashion 2<sup>nd</sup> edition 2000
- [19] David, B. (2005). *Regression analysis application: Regression sensitization as a dimension of personality*. New York: Free Press.
- [20] Dempsey, B. (2003). *Research Methods*. (4th Ed) New Jersey: Pearson Publishers.
- [21] Dobler & Burt. (2006). *Purchasing management*. (6th ed.). McGraw Hill International Edition.
- [22] Disney and Towill (2003) The impact of increasing demand visibility on production and inventory control efficiency. Volume 33. Number 4. 2003.
- [23] Ebrahim, A. S., & Rangan, V. K. (2010). The limits of nonprofit impact: *A contingency framework for measuring social performance*.
- [24] Eckert, K. (2007). Inventory management and its effects on customer satisfaction. *Journal of business and public policy*.
- [25] Edward, W. (2010). EOQ application. *International Journal of Operations & Production effective Procurement*. Vol. 27, No. 3. pp. 46-48.
- [26] Ellram. (1999), “Retail Logistics”, *International Journal of Physical distribution & Logistics Management*. (29), 477-449
- [27] Eroglu, C. (2011). *Lean, Leaner, too leaner* The inventory performance link revisited. *Journal of Operations Management*, 356-369
- [28] Ewuola, S.O., Imoundo, P.B, Ajibefun, I., daramola, A.G. & Ayodeji, O. (2005). *Inventory Management in an Agro-Allied Industry: A Case study of Cocoa processing Plants In South western Nigeria*. Retrieved on 30th July from: <http://dspace.futa.edu.ng:8080/jspui/handle/123456789/2417>
- [29] Fawcett, S.E. (2006), *Achieving World-class Supply Chain Alignment: Benefits, Barriers, and Bridges*, National Association of Purchasing Management, Phoenix, AZ.
- [30] Fawcett, S. E. (2009). *The moderating role of barriers on the relationship between drivers to supply chain integration and firm performance*. *International Journal of Physical Distribution & Logistics Management*, 39(10), 826-840.
- [31] Fogli, L. (2006). Customer Service Delivery: Research and Best Practices. In: *Customer Service Delivery: Research and Best Practices*. San Francisco: Jossey-Bass, p. 4.
- [32] Gakinya, A.M (2013). *Inventory management and supply chain performance: non-governmental organisations in the Agricultural Sector*. University of Nairobi. Unpublished Report
- [33] Githendu, D., Nyamwange, O. and Akelo, E. (2008). *Inventory Management by Simulation Analysis- A Case Study of Water Engineering Company*. University of Nairobi, Department of Management Science. Nairobi: Unpublished Report.
- [34] Githui, D. (2012). Responsible Purchasing and Supply Chain Management in Kenya: *A Critical Analysis of the Ethical Considerations in Procurement Management*. *European Journal of Business and Management*.



- [35] Godratt, M. E. (2002). *Critical Chain: A Business Novel*. North River Press.
- [36] Gonzalez, N. (2010). *Analysis of an economic order quantity and reorder point inventory control model for company XYZ*. In EOQ model (pp. 20-24). London: Prentice Hall
- [37] Gonzalez, J.L. and Gonzalez, D. (2010). *Analysis of an Economic Order Quantity and Re-Order Point Inventory Control Model for Company XYZ*. California Polytechnic State University. San Luis Obispo: Unpublished Project.
- [38] Grant, R.M. (2007). Prospering in dynamically-competitive environments *Journal of supply chain Management*. Vol.36, No.4. pp. 144-148.
- [39] Green,P&Tull,C (2009). *Research Methods*. (3rd Edition). Newyork: Pearson Publishers.
- [40] Grönroos, C. (2001). The perceived service quality concept—a mistake?. *Managing Service Quality: An International Journal*,11(3), 150-152.
- [41] Hitt.J. (2011). *Competitiveness and globalization concepts: Strategic Management*. USA: South western cengage learning.
- [42] Holdren d p & Hollingshead c a. Differential pricing of industrial series: the case of inventory financing. Volume 14. Number 1. 1999
- [43] Jensen, M., Meckling, W. (2006), "*Theory of the firm: managerial behavior, agency costs and capital structure*", *Journal of Financial Economics*, Vol. 3 No.4, pp.305.
- [44] Kaplan R.S., Norton D.P., *The balanced scorecard – measures that drive performance*, Harvard business review January-February, 71, 1992.
- [45] Kamau, T. (2011). *Influence of Corporate Governance Practices on Organizational Performance at Equity Bank Kenya*. University of Nairobi. Nairobi: Unpublished MBA Project.
- [46] Kamau, L. W. &Kagiri, A. W. (2015). Influence of inventory management practices on
- [47] organizational competitiveness: A case of Safaricom Kenya Ltd. *International Academic Journal of Procurement and Supply Chain Management*,1 (5), 72-98
- [48] Kariuki James (2013) The study was an assessment of the factors influencing effectiveness of inventory control; Ministry of State for Provincial Administration and Internal Security; Nairobi.
- [49] Kimaiyo, K. K. &Ochiri, G (2014). Role of Inventory Management on Performance of Manufacturing Firms in Kenya – A case of new Kenya Cooperative Creameries.
- [50] *European Journal of Business Management*, 2 (1), 336-341.
- [51] Kothari, C.R.,(2004), *Research Methodology-Methods and Techniques*, New Delhi, Wiley Eastern Limited.
- [52] Kothari, C.R. (2003). *Research methodology: methods & techniques*. (2nd Ed).Nairobi: New Age International Publishers.
- [53] Koumanakos,N. (2008). "Inventory control and EOQ".*Impacting Inventory Mangement*.vol.3. *International Journal of Business*, 79-80.
- [54] Krajewski l j &Ritzman l p. 1999. *Operations management. Strategy and analysis*. USA.5 edition. addison-wesley.
- [55] Lal, J., 2007. *Cost Accounting*. 3rd edition [e-book] New Delhi: Tata McGraw-Hill Publishing Company Limited. Available at: [Google Bookshttps://books.google.com/books](https://books.google.com/books)
- [56] Lee, H. &kleiner, B. (2001). Inventory Management in Womens Retail Clothing Industry: *Management Research News*. (24), 40-45
- [57] Lehtinen, E. (2002). *Developing models for distributed problem-based learning: Theoretical and methodological reflection*. *Distance Education*,23(1), 109-117.
- [58] Lucas, R. (2005). *Customer Service: Building Successful Skills for the Twenty-First Century* (3rd Edition). In: *Customer Service: Building successful skills for the twenty-first century* 3rd edition. Boston: McGraw - Hill, p. 4.

- [59] Lucey, T., 1996. *Management Accounting*. 4th edition London: Letts Educational.
- [60] Lyson K (1996). *Purchasing and Chartered Institute of Purchasing and Supply*, London: Pitman Publishing.
- [61] Margetta, J. (2008). *The power of virtual integration*
- [62] Mathur.H (2010). *Coordination of inventory and transportation managements in a two-level supply chain*. *International journal of production economics*,123(1), 137-145.
- [63] Mitchell (2004). *Determinants of Governance Choice in Business-to-Business Electronic markets: An Empirical Analysis Working paper*, Ross school of Business, University of Michigan
- [64] Mugenda&mugenda (1999). *Research methodology*; (3rd ed). Nairobi. Longman Publishers.
- [65] Mugenda, O., &Mugenda, A. (2003).*research methods: Quantitative and Qualitative methods*. Nairobi, Rev Editions.
- [66] Mukharji, B., (2011). *Relationship between supply chain strategies, logistics flexibility and supply chain performance: evidence from Canadian manufacturing industry*. *International Journal of Logistics Systems and Management*, 12(4), 433-459.
- [67] Mutua, M. (2010). *The Role of Stock Control in Organizations Performance: A Case Study of Kenya Vehicle Manufacturers Thika*.
- [68] Narkotey, M.A. (2012). *Inventory management in the Ghana Health Services and Its Role in Healthcare Delivery: A Case study of health facilities in HO Municipality*, Kwame Nkuruma University of science and technology
- [69] National Institute of Governmental Purchasing (2001). *Journal of public procurement*, Volume 1, issue 1, 71-95.
- [70] Nettesine S. and Schumsky, R. *Revenue Management games (2001): horizontal and vertical competition*, University of Pensylvannia Working paper.
- [71] Narkotey, M.A. (2012). *Inventory management in the Ghana Health Services and Its Role in Healthcare Delivery: A Case study of health facilities in HO Municipality*, Kwamen Nkuruma University of science and technology.
- [72] Nordin, R. (2002). *Inventory Cost reduction*. Retrieved on 30th August from: <http://pure.ltu.se/portal/en/studentthesis/inventory-cost-reduction>
- [73] Nynke Faber, René (Marinus) B.M. de Koster, Steef L. van de Velde, (2002) "*Linking warehouse complexity to warehouse planning and control structure: An exploratory study of the use of warehouse management information systems*", *International Journal of Physical Distribution & Logistics Management*, Vol. 32 Issue: 5, pp.381-395, doi: 10.1108/09600030210434161
- [74] Ogbo, A.I. (2011).*Production and Operations Management*. Enugu: De-verge Agencies Ltd. *Supply Chain Management: An International Journal* 12/4 (2007) 284– 296
- [75] Ohno, R. & Mae, M. (2012). *The Impact of Changing Lead-time on Inbound Logistics*
- [76] Ondiek. G. O. (2006). *Assessment of material management in the Kenyan Manufacturing firms' journal*; University of Nairobi, School of business.
- [77] Onyango R.M (2013) *Lean Enterprise and Supply Chain Performance of Pharmaceutical Companies in Kenya*. MBA Project. University of Nairobi.
- [78] Niven.P.R (2005) *balancing scorecard diagnostics; maintaining maximum performance*. J.Wiley, New Jersey.
- [79] Porter, M. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitor*. New York: Free Press.
- [80] PPOA.(2005).*Assessment of the Procurement System in Kenya Report*. A report by Public Procurement Oversight Authority, Nairobi.
- [81] Wakhungu, W.C. (2010). *Executive Succession and Performance in Small & Medium Enterprises*. University of Nairobi. Nairobi: Unpublished MBA Project.

- [82] Rad, M.H. (2008). Lead Time Reduction. A Case Study of BEAB Etikett& System AB
- [83] Ramasesh, R.V. (2007). *Procurement under uncertain lead times, a dual-sourcing technique*. Procurement Journal. Vol.14, No.18. pp. 137-147
- [84] Reichel, M., & Ramey, M. A. (1987). *Conceptual Framework for Bibliographic Education: Theory to Pract*. Littleton Colorado: Libraries Unlimited Inc.
- [85] Roger, K. (2006). *Data collection instruments: Research Methodology*. London: Prentice Hall.
- [86] Rushton, A., Croucher, P., Baker P. (2006). *The Handbook of logistics and distribution Management*. 3rd ed. Philadelphia. London
- [87] Sander, L., Matthias, H., & Geoff, W. (2010). The impact of decentralized control on firm-level
- [88] inventory evidence from the automotive industry. *international journal of physical distribution and logistics management*, 41, 435-456.
- [89] Sampurno. (2010). *Strategic resources in organizations: Strategic Management*. Yogyakarta: Ugm.
- [90] Sekaran, U., & Bougie, R. (2010) *Research Methods for Business: A Skill Building Approach*, (5<sup>th</sup> Edition). Hoboken, N.J./Chichester: John Wiley and Sons.
- [91] Silver, E. A., Pyke, D. F., & Peterson, R. (1998), "*Inventory management and production planning and Scheduling*," 3rd ededn, J. Wiley, New York.
- [92] Small Business Resource (2013). *Managing Inventory*. Retrieved on 30th July from: [http://www.esmallooffice.com/SBR\\_template.cfm?DocNumber=PL10\\_0200.htm&location=all](http://www.esmallooffice.com/SBR_template.cfm?DocNumber=PL10_0200.htm&location=all)
- [93] Stelth, P. and Roy, G.L. (2009). *Projects' Analysis through CPM (Critical Path Method)*. School of Doctral Studies (European Union) Journal (No.1).
- [94] Sulastri, M. (2006). *Resource based view theory of the firm: Strategic diversification*. Journal of business and economics management, 4-7.
- [95] Sunil B., & Sameer, P. (1998), "*International purchasing, inventory management and logistics research: An assessment and agenda*", International Journal of Physical Distribution & Logistics Management, Vol. 28 Iss: 6 pp. 403 – 433.
- [96] Susan, T., & Michael, K. (2000, October 28) *TCRP Research Results Digest-Number 40*.
- [97] Sushma. (2007). *Effects of ICT application on corporate performance, an emperical study*. Global Business Review, 8, 267
- [98] Thogori M. & Gathenya, J. (2014) Role of Inventory Management on Customer Satisfaction among the Manufacturing Firms in Kenya: A Case Study of Delmonte Kenya. *European Journal of Business and Management*. Vol.6, No.27, Pp. 209-217. Available Online-[www.iiste.org](http://www.iiste.org).
- [99] The Financial Times – article published on September 16, 2008 <http://www.ft.com/intl/cms/s/0/00712422-840d-11dd-bf00-000077b07658.html#axzz2OqG6wmq8> [accessed July 2017]
- [100] Tracey, V. (2005). *The impact of supply chain management capacity on business performance*. In Supply chain management (pp. 179-192).
- [101] Tumuhairwe, S. (2012). *Inventory Management and Profitability: A Case Study of Roofings Ltd Uganda*. Research Project Masters of Science, Makerere University.
- [102] Umble, R. (2006). *Implementing theory of constraints in trading in Japanese manufacturing*. International journal of production research, 1863-1880
- [103] Wang. (2007). *Random fuzzy EOQ Model with imperfect quality items*. In Fuzzy optimal decision making (pp. 139-153). London: Prentice Hall
- [104] Waweru (2010). *Commercial Electricity Supply Chain Management Practices in Kenya*. University of Nairobi, Management Science. Nairobi: Unpublished MBA Project

- [105] Wild, T. (2002). *Best Practice in Inventory Management* (2nd Ed.). Oxford, Great Britain: Published by Elsevier Science Limited.
- [106] Wallin. (2007). *Inventory ownership and placement decisions for an externally sourced item within a buyer-supplier*. In *Inventory Management*. London: Prentice Hall.
- [107] Yusuf,A.(2003). *Inventory control and Economic Order Quantity in National Electric Power Authority (NEPA) St Clement Univesity*
- [108] Zander, U. (2007). *Knowledge of the firm, combinative capabilities*.(2nd Ed).London: Kogan Page Publishers
- [109] Zhang, H., &Okoroafo, S. C. (2015). *Third-party logistics (3PL) and supply chain performance in the Chinese market: a conceptual framework*. *Engineering Management Research*, 4(1), 38.
- [110] Yugang, H (2009). Stackelberg game-theoretic model for optimizing advertising, pricing and inventory policies in vendor managed inventory (VMI) production supply chains. *Computers & Industrial Engineering*, 57(1), 368-382
- [111] Zhang, Q. (2005). *Logistics Flexibility and it's impact on Customer satisfaction*. *International Journal of Logistics Management*, (16), 71-95
- [112] Zinbarg,M. (2005),*Research methods*.(1st Edition).New Jersey: Pearson Publishers. NewJersy.