EFFECT OF LEAD TIME VARIABILITY ON INBOUND LOGISTICS PERFORMANCE IN SAFARICOM LIMITED

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ABSTRACT

Time is a great issue in the telecommunication industry as technology is dynamic. Lead time carries huge importance when delivering products. Lead time (LT) is a core parameter that varies and affects all supply chain (SC) partners hence varying lead times could therefore have an effect on the supply chains. Because logistics supports time and place commitments in the supply chain, it can be argued that the lead-time frontier accounts for at least half of logistics success. The main purpose of this study was to determine the contributors of lead time variability and the effects of lead time variability on the inbound logistics performance. This study was based on Safaricom Limited a major player of mobile telecommunication industry in Kenya. Various studies have been done on lead time management and its effects on overall organizational performance. The study sought to further the knowledge gap in lead time variability to enable organizations gain competitive advantage. Chapter two covers the Literature Review which begin by discussing the theoretical review of theories relevant to the study, conceptual framework, review of independent and dependent variables, critique of existing literature and summary of the research gaps based on the literature. Discussions on some key terms which have helped to structure the thinking about the wider perspective of strategic sourcing in supply chain management were explored. This study looked at the Supply Chain Operations Reference Theory, Queuing Theory, Theory of Constraints and the Principal-Agency Theory to systematically interrelated concepts, definitions and propositions that are advanced to explain or predict phenomena. The third chapter covers the research methodology, the study used the descriptive design and the questionnaires as a data collection instrument within the same organization. The target population was employees in Safaricom Limited who deal with the inbound logistics services and the sample frame was a register from Human resource department. The technique adopted in this research was Stratified sampling with a desired sample size of 70 respondents hence distributed along the stratum which will represent about 60% of the stratum population of 120 employees. A pilot study was carried out on 10% cases drawn outside of the target population outside of the intended study. Data collection was both quantitative and qualitative, questionnaires were used to collect data and analysis by use of linear regression model was used to establish the relationship between the independent and dependent variables. The study found that production lead time, shipping lead time, customs brokerage TAT time and Receipt and Inspection of goods velocity have a high impact on inbound logistics performance of the organization. The study concludes that lead time variability elements in production lead time; shipping lead time; customs brokerage turnaround time; receipt and inspection velocity have a significant effect on time delivery, cost and quality as a measure of inbound logistics performance. The study recommends that the organization needs to find ways of reducing lead time variability so that lead time to improve inbound logistics performance.

Key Words: *lead time variability, inbound logistics performance, Safaricom Limited*

INTRODUCTION

The Business world continues to be competitive and with the technological advancement organizations are focusing on strategies like high customer service levels, lower costs and managed lead times as a competitive advantage. Organizations have become more customer focused hence putting in significant efforts to delight customers for survival. According to Arnold (2014), the 1970s significance of logistics has greatly increased the activities required to accomplish various logistical functions and strategic planning process which include coordination and collaboration with the channel partners namely suppliers, intermediaries, third-party service providers and customers' increases. While historically supply efficiency was the primary concern for businesses, since the 1980s the need for agility and speed to respond to a demand trend has received increased attention both from industry and academia (Christopher, 2005)

Granville (2012) notes that the sphere of logistics management involves a multitude of different factors which include transportation management, freight and inventory management, materials handling, and order fulfillment. Thus, an effective logistics system contributes immensely to the achievements of the business and marketing objectives of a firm. Technological advances and economic liberalization have created new opportunities for countries to harness global markets for economic growth and development. But expanded supply chains and global production networks put a new premium on moving goods in a predictable, timely, and cost-effective way. According to Handfield (2007) logistics creates time and place utilities in the products and thereby helps in maximizing the value satisfaction to consumers. By ensuring quick deliveries in minimum time and cost, it relieves the customers of holding excess inventories. It also brings down the cost of carrying inventory, material handling, transportation and other related activities of distribution. Lead time is a very important component in a customer's perception of business performance; it has become an order qualifier (Rushton, 2014)

Global Perspective of Lead Time Management Practices

The Council of Supply Chain Management Professionals (CSCMP), the preeminent worldwide professional association of supply chain management professionals, defines logistics as "…that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements (CSCMP, 2010). Logistics covers both inbound and outbound logistics. In Porter's Value chain inbound logistics is a primary activity hence key to an organization. Inbound Logistics refers to the transport, storage and delivery of goods coming into a business.

Local Perspective of Lead Time Management Practices

Arvis (2014) views that removing unnecessary barriers to timely delivery is of the utmost importance for developing countries. Kenya is a hub of East Africa and serves neighboring countries like Uganda, Burundi, Rwanda and South Sudan. Kenya's performance on the various logistics parameters mainly based on lead time according to the World Bank Logistics Performance indicator is as per table 1.

Table 1: World Logistics Performance Indicator Results

Measure	Ranking	Index
Customs	151	1.96
Infrastructure	102	2.40
Logistics quality & Competiveness	90	2.65
International Shipments	50	3.15
Tracking & Tracing	60	3.03
Timelines	45	3.58

Source: World Bank (2014)

Although international shipments, infrastructure and logistics competence have improved marginally since 2007, customs, track and trace and timeliness have all declined significantly over the period. Mombasa port is important to the region but congestion is still a major problem hence affecting customs clearance lead times (Kafeero, 2008).

A study by Mfwaya (2013), found out that most of the companies had multiple suppliers of various products and services, trying as much as possible to reduce variability, always having a smooth workflow in the organization, having proper queue control to avoid delays, expediting some processes to avoid delays, using multi modal transportation to avoid delays and offering warranty of the products/services for at least 12 months significantly affects customer satisfaction positively. (Bosire, 2013) noted that outsourcing influenced queue time to a very large extent whilst set-up time, problem solving time, run time, waiting time and synchronic-time were influenced to a large extend. The study also established that outsourced services were positively correlated to lead time components on average the correlation co-efficient ® was 0.66

'Time is money' is perhaps an over-worked cliché in common parlance, but in logistics management it goes to the heart of the matter (Novack, 2013). Not only does time represent cost to the logistics manager but extended lead times also imply a customer service penalty. Reducing the lead time required to design, manufacture and distribute the products is nowadays a powerful source of competitive advantage for fast fashion companies. Variability is the statistical distribution of outcomes one can expect from a process, this has recently seen supply chain managers having to anticipate, plan for and react to a widening array of demand and supply scenarios (Lambert, 2005). Lead time management is therefore very important in all organizations (Sabri, 2015) more so the mobile telecommunication industry as the sector is highly dependent on the most recent technology which is very dynamic. Customers are highly informed of their demands and hence hold high expectations and Innovational is also high as customers demand for instant solutions. Lead time is the

average time it takes for one work item to go through the entire process – from start to finish – including time waiting and time consumed by rework. In most cases, unless you are intentionally managing your lead time, you will have lead times that are highly inconsistent and probably excessively long. It is therefore important to manage the inconsistency.

STATEMENT OF THE PROBLEM

The telecommunication industry now competes with the Voice over Internet service providers, therefore must be agile and ensure delivery is done on time otherwise customers will seek for other alternatives hence lost sales. The dynamics in telecommunications industry are complex as technology changes rapidly therefore responsiveness, speed and delivery is key which comes with a price impacting either the purchasing or logistics costs. One common problem arising from making trade-offs in leading telecommunication companies, like Safaricom Limited, is that different departments have incompatible measurement systems and do not share a common vision (Lysons, 2007).

In Kenya leading corporates like Safaricom have a large spend on logistics, in 2011/12, out of the Kes108 Billion paid out to various stakeholders Kes43 Billion was paid to suppliers representing 40% of spend, Safaricom (2012). This is an indication of the amount of supplies that are delivered to the company hence importance of lead time management. According to Robinson (2014) by adopting a logistics efficiency management approach, logistics related costs as a percentage of sales drops from 7% to 4% depending on industry sector. The role of supply chain management is to reduce variability while at the same time putting in place synchronized and responsive processes for managing variability. Companies that do this effectively are able to gain significant advantage over their competitors (Martin, 2014). Inbound Logistics acts as the link of ensuring all products for the network infrastructure and other enablers like phones are shipped on time hence management of lead times variation is key.

Studies done on lead time management by Christensen et al (2007) and Germain et al (2008) observed that variability in lead time performance leads to excess inventories, inventory shortages, or both, impacting the bottom line significantly in either case. Yet, evidence is most companies do not really have a handle on lead-time variability, and that it is wider than most companies might guess (Ratliff, 2006). With continued shrinkage in returns for most organizations and continuous reduction in call rates it is imperative that companies like Safaricom optimize its service delivery through a supply chain hence managing lead time variability is crucial. Most studies lead time management mainly focus on manufacturing firms with very little or no reference to the telecommunication firms. Every business environment has a different operating environment depending on the nature and is therefore imperative to bridge this existing research gap within the telecommunication sector, hence the motivation in this particular study as it seeks to evaluate the effects of lead time variability on inbound logistics performance, with a particular interest in the Kenyan telecommunication sector, while focusing on a case of the largest leading mobile telecommunications company in Kenya.

GENERAL OBJECTIVE

The purpose of this study is to evaluate the effects of lead time variability on Inbound Logistics performance in mobile telecommunication companies in Kenya: a case of Safaricom Limited.

SPECIFIC OBJECTIVES

1. To examine the effect of production lead time on inbound logistics performance at Safaricom Limited.
2. To establish the effect of shipping lead time on inbound logistics performance at Safaricom Limited.
3. To assess customs brokerage turnaround time impact on inbound logistics performance at Safaricom Limited.
4. To determine the effect of receipt and inspection of goods velocity on inbound logistics performance at Safaricom Limited.

LITERATURE REVIEW

Theoretical review

According to Bell (2011) theories are formulated to explain, predict, and understand phenomena and, in many cases to challenge and extend existing knowledge within the limits of critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of research study. The theoretical framework introduces and describes the theory that explains why the research problem under study exists. It consists of concepts, and, together with their definitions and reference of relevant scholarly literature, existing theory that is used for your particular study Schindler (2013). Some of the relevant theories that this study will look into include Supply Chain Operations Reference Theory, Queuing Theory, Theory of Constraints and Agency Theory.

Supply Chain Operations Reference Theory

The Supply Chain Operations Reference (SCOR) model is an important approach that has been developed to aid with cost and performance monitoring. It is a hierarchical consisting of four different levels: competitive advantage, strategy implementation and process definition, detailed process elements, and implementation (Rushton, 2014). The supply-chain operations reference-model was developed in 1996 by the management consulting firm PRTM, now part of PricewaterhouseCoopers LLP (PwC) and AMR Research, now part of Gartner, and endorsed by the Supply-Chain Council (SCC), now part of APICS, as the cross-industry de facto standard strategy, performance management, and process improvement diagnostic tool for supply chain management. The SCOR model describes the business activities associated with satisfying a customer's demand which include plan, source, make, deliver & return. Use of the model includes analyzing the current state of a company's processes and goals, quantifying operational performance, and company's performance to benchmark data. SCOR has developed a set of metrics for Supply Chain performance, and Supply Chain Council members have formed industry groups to collect best practices

information that companies can use to evaluate their supply chain performance (Rosenbaum, 2011). If an organization does not protect against lead-time variability, it will end up with more "Out Of Stock" situations. In fact, whenever an organization does not have any supply chain variability, they just have to buffer it with either more inventory, more capacity this is whereby opt for airfreight, or time by making your customers wait or higher OOS (Watson, 2014)

Inbound Logistics Peformance being one of the parameters, can be measured by looking at the production lead time, shipping lead time, customs brokerage turnaround timelines as well as the receipt and inspection of goods velocity. The organization can then be able to root cause the source of delays and look for ways of improvement and variability reduction (Poluha, 2007). Metrics of measure must therefore be in place to enable organization trace the causes of variability in either the production, shipping, customs clearance or delivery and inspection lead times.

Queuing Theory

Queuing Theory is defined as a mathematical method of analyzing the congestions and delays of waiting in line (Kaskarelis, 2010). Queueing theory has its origins in research by Agner Erlang a Danish engineer who worked for Copenhagen Telephone Exchanged in 1909 He modeled the number of telephone calls arriving at an exchange. The ideas have since seen applications including telecommunication, traffic engineering, computing and the design of factories, shops, offices and hospitals (Gross, 2008)

Practical applications of queuing theory include providing faster customer service, improving traffic flow, shipping orders efficiently from a warehouse and designing telecommunications systems such as call centers. Being able to control inventory in an optimal manner lets businesses improve efficiencies and ultimately their bottom lines. This kind of efficiency is not limited to large multinational enterprises; even small to medium businesses are able to leverage these advanced queuing techniques to improve their inventory handling processes. (Williams, 2013).

Queuing also helps with allocation of equipment and personnel (Zhilan, 2011). Considering the factors of ways to reach customer, service, equipment and personnel service, it is wise to increase the number of equipment and person to improve service level, reduce queuing time and attract more customer. From the view of customer, solving the problem of queuing is effective for bettering customer service and saving cost. This would therefore affect production lead times as well as receiving and inspection velocity hence an appropriate queue management process must be in place. With appropriate queue management an organization can be able to root out causes of variation either in the production lead time, shipping lead time, border clearance lead time or receipt and inspection of goods velocity ensuring the process is improved accordingly.

Theory of Constraints

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 and then systematically improving that constraint until it is no longer the limiting factor (Godratt, 2002). Constraints can be external or internal, an internal constraint is in evidence when the market demands more from the system than it can deliver. If this is the case, then the focus of the organization should be on discovering that constraint and following the five focusing steps to open it up (and potentially remove it). An external constraint exists when the system can produce more than the market will bear. If this is the case, then the organization should focus on mechanisms to create more demand for its products or service (Schleier, 2010).

TOC also brings in the angle of bullwhip effect. Bullwhip Effect is an extreme change in the supply position upstream in the supply chain generated by a small change in demand downstream in the supply chain. Inventory can quickly move from being backordered to being excess. According to Tripp (2005) this is caused by the serial nature of communicating orders up the chain with the inherent transportation delays of moving product down the chain. This can be eliminated by synchronizing the supply chain. This theory comes into play in production lead times and border clearance turnaround time as well. Along the chain, the constraint of lead time variation could be either during production, shipping, customs clearance or delivery and inspection lead times. It is imperative therefore that this constraint in the inbound logistics lead time is improve on it so that it is no longer the limiting factor (Cox, 2010).

Principal-Agency Theory

Principal–agent theory (PAT) was developed in the field of economics in the 1970s by Stephen Ross to understand the prevailing problems that appear every time Person A (the "principal") asks Person B (the "agent") to do something on his or her behalf for a given price. The solution to this double asymmetry is an outcome-based contract in which it is stated that the agent receives a bonus in case a certain outcome is reached. PAT explores how these contracts should be designed according to the variations in the informational asymmetries (Kaskarelis 2010). As freight and forwarding involves use of 3PL this principal agent theory applies.

Principal Agent Theory is concerned with the governance and control mechanism structure of firms to mitigate the chances of opportunism, conflicting interests and information asymmetry between the Principle who is the delegating authority and the Agent. Production, shipping, border clearance, receipt and inspection of goods are handling by third party logistics service providers hence this theory comes into play. Many third parties and government agencies both at the port or airport of origin as well as the destination are part of the chain. A strong partnership emphasizes direct, long-term collaboration, encouraging mutual planning and problem solving efforts. There are many parties involved in the inbound

logistics process who include, freight forwarders, customs clearance agents, insurance agents, inspection agencies who will act on behalf of the importer. It is imperative therefore that the importer forms a working collaboration with the agencies to ensure delays are minimized (Laffont, 2009).

CONCEPTUAL FRAMEWORK

Conceptual Framework refers to when a researcher conceptualizes the relationship between variables in the study and shows the relationship graphically or diagrammatically. It is a hypothesized model identifying concepts under study and their relationship. An independent variable is a property of a phenomenon which influences or affects others while a dependent variable is one which is influenced by the independent variable (Mugenda 2003). In this study Inbound Logistics performance influenced by production lead time, shipping lead time, border clearance turnaround time and receipt and inspection of goods velocity.

Production Lead Time

Today, as a result of offshore sourcing, manufacturing and assembly, supply chains extend from one side of the globe to the other hence possibility of more variable lead times (Christopher, 2008). The production time is the time the supplier requires producing the necessary items for an order. The elements of production lead time which include Set-up time, processing time, materials handling time and queueing time (Suri, 1998). Setup time is total elapsed time from completion of the last good part from the previous setup to the first good part from the new setup (Meng, 2010). Toyota began a campaign to reduce setup times in 1971. Five years later, the time required to set up presses to form fenders and hoods had fallen from 1 hour to 12 minutes, while U.S. manufacturers needed 6 hours to perform the same task. Toyota continues to strive for a concept it calls "single setup," which means less than 10 minutes for performing a setup. As the company continued to emphasize reduction of setup times, its operations became capable of "one-touch" setups, which take less than 1 minute.

Variability in process time is a contributor on the total production lead time hence impacting on inbound logistics performance. Material handling time is necessary to move materials from one work center to the next work center (Ray, 2013). This time includes waiting for the materials handling equipment and actual movement time reduces total cost of production (Groover, 2010). According to Huo, (2003) queue time is a very specific form of waiting, one of the traditional seven wastes. The operations manager must aim therefore to reduce queue time in the production plant. Other causes of variability during production include lack of consistency, downtime and rework. There are also structural problems which all emerging markets suffer from due to lower training levels of the workforce and the false lull of abundant cheap labor albeit poorer technical quality (Snap, 2012). Lead time reduction is a great way to improve productivity, increase output of finished products and streamline operations. Organizations that have focused on cycle time as a productivity measure can reduce delivery time and improve quality thereby creating a more satisfied customer (Rad,

2008). Variation in production lead time has a direct effect on the total lead time hence affect inbound logistics performance in terms of delivery time.

Shipping Lead Time

Transport is not only an integral part of the supply chain but also the most significant contributor to logistics costs. (Tseng, 2005). Transportation or shipping lead time refers to the number of working days normally required for goods to move between shipping and receiving point, plus acceptance time in days at the receiving point. The transportation lead time represents the amount of time needed to transfer the completed order from the supplier's shipping point to the buyer's receiving point (Choi, 1999). The main modes of transport are air, sea, road and rail, the other factors to be considered are like carriers' capability, accessibility, reliability and security provided. Another important element in shipping lead time is transit time which is time it takes in number of hours, day, weeks or months to move a consignment from either airport or port of origin to destination (Waters, 2009).

The transit time is affected by factors such as the warehouse location, the freight carrier, and the customer location. Additional factors such as the days of the week that the warehouse, customer and carrier are closed also affect the lead time. Players in the transportation chain also include freight forwarders who organizations outsource the transport element to either 3rd Party Logistics Services Providers (3PL). Variation in both loading time and pick time do have direct impact on the overall shipping performance (Arikan, 2014). The mode of shipment has an effect on lead times which could have a direct impact on the cost as well. Dependent on the urgency of goods choosing a mode that could delay delivery could result to "Out of Stock" situations. In cases whereby an organization has a performance bond in place delays in delivery could lead to hefty penalties.

Customs Brokerage Turnaround Time

Customs Brokerage or border clearance is the act of passing goods through customs so that they can enter or leave the country (Mujica, 2014). Customs administrations are a critical component in the efficiency of international trade as they process every consignment to ensure compliance with national and regulatory requirements as well as international trading rules (Kenya Revenue Authority, 2004). One of the methods used for the review of clearance procedures is to measure the average time taken between the arrival of goods and their release. This facilitates Customs to identify both the problem areas and potential corrective actions to increase efficiency (Oloo, 2004).

Goods shipped on DDP – Delivered Duty paid then the supplier is charged with the responsibility of customs clearance and delivery to buyer's door however excluding unloading (ICC Chamber of Commerce, 2010). In Kenya free storage period for airfreight shipments is 48 hours after shipment arrival and 5 days after vessel arrival for sea freight shipments failure to clear within the free storage period results to storage charges and demurrage costs (Shippers Council of East Africa, 2014). There is also the usual problem of inefficiency of cross border clearance processes (speed, simplicity and predictability of

formalities) by border control agencies. Long waiting times at certain check points is an undesired trade barrier. Over the last ten years automation has brought a great improvement and simplification in the customs. This integration is referred to as Single Window whose main is to facilitate trade (Kabuga, 2014). There are also still regulations like Pre-Export Verification of Conformity (PVOC) which must be done at county of origin before shipping (Intertek, 2015). Red tape leads to longer customs brokerage turnaround time which has a direct effect on cost as demurrage charges have to be paid as well as delayed deliveries which could result to lost sales.

Receipt and Inspection of goods Velocity

Receipt of goods is the act of taking possession of goods in order to stage them for inspection or place them into inventory whereas Inspection is the act of examining goods that have been delivered to determine conformance to what was ordered via the purchase document (Richards, 2014). In some cases, the acquisition may require specialized skills or expertise in examining the goods to determine conformance. The basic function of the receiving and inspection process is to take responsibility for the inbound material, validate the material received to the purchase order (PO), check for any damage to the material received and complete any required material inspections. Getting it right when you receive material will reduce headaches in the downstream processes (Handfield, 2007).

The primary objectives of the receiving function include: safe and efficient unloading of carriers; prompt and accurate processing of receipts; maintenance of accurate records detailing receiving activities and timely disbursement of receipts of stocking locations in preparation for picking and shipping (APICS, 2010). This is the final lead time component which represents the amount of time required to properly receive, count, inspect and move the items to the appropriate locations. There must be a delivery plan which has to start by scheduling the arrival date and time, the type and quality of material to be received, the availability of docking and material handling capacities, and the preparation of staging areas. Time taken for product delivery and unloading of goods from the carrier. Once unloaded they are counted, inspected and documents processed. The receipt is first verified against the original order and receiving documents which include Bill of Lading, Packing List and labels. After quick damage inspection is performed, the receipt is unpacked, sorted, counted and authorized. (Berg, 2010). Receiving and inspection process marks the last leg in the inbound process and therfore time is of essence in ensuring that upon delivery goods are inspected for conformity and completeness in good time. Only after this process that are goods then put away and thereafter requisitions to issue given. It is at this stage that any non conformance issues like damages, short delivery or not confirming to standards can be raised with the supplier in good time or lodge a claim with the liable party in cases of damage. Should claims not be lodged within a stipulated time then the organization is bound to lose monies by taking up the responsibility to replace. Therefore this affects performance in terms of cost, quality and on time delivery if not undertaken with speed (Harisson & Fichtinger, 2013)

Inbound Logistics Performance

According to Petit el al (2010) logistics performance is composed of 3 key functions which are logistic productivity that is cost and service metrics, Logistics Service Performance which entails product availability, order fulfillment, logistics and system flexibility to meet customer service goals and lastly Logistics Performance measurement systems which covers the content of actual metrics and how performance is to be tracked.

Measurement of logistics and supply chain management (SCM) Key Performance Indicators (KPI) is an essential part of the agile supply chain concept. Logistics costs matter not only at the company level but at national and regional levels. Costs amount to a sizable fraction of a nation's GDP (Gooley, 2015). Broadly, at the national level the focus is more logistics performance parameters such as cost, safety, efficiency, and carbon footprint. At the company level, firms focus on logistics cost mainly because of its impact on the organization's bottom line. The main reasons why firms measure their logistics performance is to reduce operating costs, drive revenue growth, and enhance their shareholder value (Durtsche, 2006). The three broad categories by which companies evaluate logistics performance measures are cost, quality and on time delivery. Efficiency contributes to performance, which is the capability of an enterprise to deliver products or services to its customers in the most cost-effective manner.

Costs associated with transportation function can be identified in total and segments that is inbound, outbound, by vendor, by customer, by mode, by carrier, by product, or by channel. This detail is necessary to determine the incremental costs associated with changes in the logistics system (Transportation, 2013). Shipping costs can be reduced by specifying a preferred mode of shipment and also expediting costs to be incurred should there be wrong lead time forecasting and items are delayed, as well as storage and demurrage costs incurred in cases of delays during customs clearance (Nasir, 2008). Management should strive to reduce the total cost of logistics rather than the cost of each activity therefore when looking at lead time in total for inbound logistics in order to improve efficiency each of the variable, production, shipping, customs brokerage and delivery should be looked into as a whole inbound logistics chain (Supply Chain Digest, 2006).

Delivery Performance is the percentage of orders that are fulfilled on or before the customer's requested date (Donald 2008). This measures the amount of time which could be in minutes, hours, days, or weeks, from the moment the cargo arrives in the port or airport until the moment that it clears customs, arrives at the warehouse, and is ready to be put away. Delivery performance can be measured by on time delivery. This determines whether a perfect delivery has taken place or not, it thus measures customer service (Johnston, 2013). Inbound logistics professionals work on process improvement in order to enhance on time delivery which is a measure too dear to all customers. If goods are not delivered on time this could result to stock outs and subsequently lost sales. Again if goods are delivered earlier than expected while stocks are still in the warehouse or retail pipeline then this translates to excess stocks therefore there has to be a balance on timing of stock arriving (Hugos, 2011).

Quality is no longer an order winner but rather an order qualifier. Quality can be defined as the standard of something as measured against other things of a similar kind; the degree of excellence of something (Lu, 2011). Quality also includes inventory accuracy and shipment damage, that is, shipment being delivered in correct quantity and without any damage. The cost of doing a quality job, conducting quality improvements and achieving goals must be carefully managed, so that the long-term effect of quality on the organization is a desirable one. These costs must be a true measure of the quality effort, and are best determined from an analysis of the costs of quality. Cost of quality is also an important communication tool Repairs & servicing, warranty claims, complaints and returns (Neely, 2005). Crosby demonstrated what a powerful tool it could be to raise awareness of the importance of quality. He referred to the measure as the "Price of Nonconformance", and argued that organizations chose to pay for poor quality. Quality-related activities that will incur costs may be split into prevention costs, appraisal costs and failure costs (Partridge, 2013).

EMPIRICAL REVIEW

Several researches have been done on lead time variability, Christensen, (2007) in his research found that supply chain lead-time variance leads directly to financial performance, whereas supply chain lead-time average does not. Variance in supply chain lead- times increases, the financial performance of the organization decreases. Further, these relationships are universally valid regardless of demand uncertainty, production technology routineness, product complexity, and size. Thus, variance in supply chain lead-times is a key determinant of financial performance. Previous research by Kader, (2014) in Bangladesh on analysis of the factors affecting lead time for export of readymade apparels in which he does state that lead time is one of the main competitive factors among companies. He established that the ability to deliver quickly influences export, sales and thereby revenue and an extended lead time is one of the major problems that the apparel sourcing world is facing when exporting readymade apparels from Bangladesh.

On delivery lead time and the decision making, Fang (2009), states that order quantity in the two-echelon supply chain composed of a purchaser and a supplier. Cost compression in the lead time adopts the non-linear model. Both the supplier and purchaser should bear the additional cost caused by shortening the lead time according to their own conditions in order to minimize the cost of the entire supply chain. This thesis also analyzes the minimum cost when lead time being a constant and a variable respectively. Discussing the process co-determination and that of centralized one as well as their influence on the cost when lead time being a variable, this thesis testifies the practicality and efficiency of the model through the numerical examples. The result demonstrates that compressing the lead time under co-determination is most conducive to minimization of the cost of the supply chain. (Fang, 2009).

Harrison & Fichtinger (2013) looked out on improvements in variability that had different impacts, depending on the source of the variability and frequency of the shipments and found out that the highest inventory reduction potential arises from a combination of high reliability and improved frequency. This study was based on assumption that the replenishment system

is aligned with the schedules of the transportation system. If this not the case, the benefit of increasing the frequency of shipments will even be higher since the mean waiting time for the next shipment will decrease (Harrison & Fichtinger, 2013). According to Burstein (2011) in his Apparel/Gartner PLM report, faster time to market ranks as the most sought-after benefit of PLM initiatives. PLM is an essential technology for optimizing lead times; respondents to the annual survey reported total cycle time savings of 8 to 11 weeks from PLM implementations, while also reducing development time by up to 30 percent. Fast-fashion retailer Zara sets the standard in lead-time reduction, taking only two to three weeks from design to in-store availability. Few if any companies can match Zara's legendary turnaround time, but fashion and apparel companies are clearly focused on shortening their product lifecycles (Bragg 2009).

In a study on how repair time variability affects production lead time (Zong, 2008) found out that when the repair-time variability of a non-bottleneck increases, its queue-times and downstream bottleneck queue-times will increase. The combined increase of queue times will cause significant increase of system lead-times. Other previous studies by He (2011) demonstrate that it is Lead time variability and not the mean lead time that affects the inventory policy and the total supply chain cost. This are critical observations that aid organizations on working on inventory policies. Germain et al (2008) in their study on the links among organizational structure, supply chain process variability and performance as moderated by environmental uncertainty found that in a predictable demand environment, only formal controls affects supply chain process leading to improved financial results. However in unpredictable demand environment, only cross-functional integration affects supply chain process variability, leading to improved financial performance. They concluded that supply chain process variability has an inverse relationship with financial performance, regardless of the demand environment; and organization structure provides managers with mechanisms to mitigate this variability's detrimental impact on financial performance.

A study by Mfwaya (2013) found out that the majority of telecommunication companies in Kenya agreed that their companies tried as much as possible to reduce variability, the companies also agreed that they keenly followed their customer queues and made sure that there was proper queue control to avoid delays that could lead to customer dissatisfaction. Majority of the telecommunication companies also expedited some processes to avoid delays and made sure their companies were satisfied. It was also realized that there is a positive significant relationship between lead time management practices and customer satisfaction. (Mfwaya, 2013). Other studies in Kenya by Bosire et al (2013) observed in his study on supermarkets in Kenya that outsourced services were positively correlated to lead time components. A study by Chelimo, (2012) by on Positioning Strategies used by firms in the Telecommunication Industry in Kenya established that most telecommunication firms are preferred by customers because of their competitive prices, product characteristics, technological advancement and superior product characteristics as this affects positioning to a greater extent. In another study on impact of logistics management in Pubic Healthcare (Tarty, 2012) established there are 10 factors that impact on lead time among healthcare facilities in Nairobi which include equipment failures, poor warehouse management, poor

flow of information, poor order shipping, poor order listing, poor order sorting, ordering costs, bureaucracy in government, order packaging challenges and poor warehouse planning.

RESEARCH METHODOLOGY

Research design

Creesswell (2003) defines research design as, it is the plan for collecting and utilizing data so that desired information can be obtained. The design of this study was a cross sectional descriptive survey. This study was carried out by means of Descriptive studies as means of questionnaires within the same organization was utilized. The study was based on dependent variables and the relationship with the independent variable. A descriptive study is one in which information is collected without changing the environment (nothing is manipulated). Sometimes these are referred to as "correlational" or "observational" studies. Descriptive studies are also conducted to demonstrate associations or relationships between things in the world around you.

Target Population

A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics (Bell, 2007). All individuals or objects within a certain population usually have a common, binding characteristic or trait (Lincoln, 2005). In this study the population was employees of Safaricom Limited. According to (Lavrakas, 2008) target population is the population for a survey is the entire set of units for which the survey data are to be used to make inferences. A case study of Safaricom Limited was chosen since it has the highest spend on International suppliers for goods and services delivery across their Supply Chain amongst mobile telecommunication companies in Kenya. The target population was employees in supply chain, Retail Planning, Spares and Network Planning departments in Safaricom Limited in Nairobi County drawn from 120 employees

Sample Techniques

Sampling techniques or methods are used to select a sample from within a general population (Kothari , 2004). Proper sampling methods are important for eliminating bias in the selection process. They can also allow for the reduction of cost or effort in gathering samples. The technique to be adopted in this research is Stratified sampling, which is used when the population is divided into strata and the interest is to include the stratum when taking a sample (Mathews, 2010). This study adopted a proportionate stratification approach whereby the sample size of each stratum was proportionate to the population size of the stratum.

Sample Frame and Size

A sample frame is a list of elements from which the sample is actually drawn and is closely related to the population (Schindler, 2013). In this study the frame will be a register from Human resource at Safaricom limited hence study only focuses on one subject which is Safaricom Limited. According to (Kumar, 2015) sample size is an important concept in statistics, and refers to the number of individual pieces of data collected in a survey. The

sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample (Panneerselvam, 2004).

The size of a strata sample size is determined using below equation,

$$n_h=\left(\frac{N_h}{N}\right)*n$$

Desired sample is 70 respondents hence distributed along the stratum as follows:

50/120*70=29.1=30 40/120*70= 23 20/120*70=11 10/120*70=6

Therefore; 30+23+11+6=70. This represents about 60% of the population.

Data Collection Instruments

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Kothari, 2004). Regardless of the field of study or preference for defining data (quantitative, qualitative), accurate data collection is essential to maintaining the integrity of research. Both the selection of appropriate data collection instruments (existing, modified, or newly developed) and clearly delineated instructions for their correct use reduce the likelihood of errors occurring (Strauss, 2007) The researcher used questionnaires which has benefits of privacy, low cost and customization.

Data Collection Procedures

Data collection procedures is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes. In this study, the questionnaires were distributed by e mail as this is a more cost effective way. The researcher then followed up with telephone calls to confirm receipt and a reminder to complete.

Data Analysis Methods and Presentation

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision-making (Fuller, 2009). Based on predictors and the outcome, the study used the below model for, a variance approach (ANOVA) in estimation of parameters of interest fitting in a multiple linear regression model:

$$Y_{ij}=\beta_{0i}+\beta_{1i}X_{1i}+\beta_{2i}X_{2i}+\beta_{3i}X_{3i}+\beta_{4i}X_{4i}+\varepsilon_{ij} \quad , i=1,2\ldots.4 \; j=1,2,3$$

The statistical package for the social science programme (SPSS) was used to analyze the data coded and ANOVA to test the level of significance of the variables on the dependent variable at 95% level of confidence and 5% level of significance.

RESEARCH RESULTS

Inferential Analysis

Inferential analysis is used in this study to determine if there if a relationship and an outcome and also the strength of the relationship. In this study researcher used inferential statistics to make judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in this study. The study conducted inferential analysis to establish the relationship between the independent variables and the dependent variable. The discussion that follows is twofold, first, a presentation of analysis of variance results followed by a presentation of multiple regression parameter estimates.

Analysis of Variance (ANOVA)

Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences among group means and their associated procedures (such as "variation" among and between groups), developed by statistician and evolutionary biologist Ronald Fisher. The general research question was does production lead time, shipping lead time, customs brokerage turn-around time and Receipt and Inspection of goods velocity affect Inbound Logistics at Safaricom Limited?

Table 1: Analysis of Variance in Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	11.745	4	1.307	2.122	0.04
Residual	40.185	62	0.616		
Total	**51.93**	**66**			

The results in Table 1 are significant at 4% (P =0.04). This implies that there is a very strong relationship between lead time variability and Inbound Logistics performance in Safaricom Limited. Hence, from these results it can be concluded that the model is good and can be used for the estimation of effects of lead time variability on Inbound Logistics performance in mobile telecommunication companies in Kenya. The study used ANOVA to establish the significance of the regression model from which an F with significance value of p=0.040 was established. This therefore means that the regression model has a confidence level of over 95% hence high reliability of the results. The significance tests for the overall model; Using p-value, the regression model is significant since 0.040<0.05.

Multiple Linear Regressions

The researcher conducted a multiple regression analysis so as to determine the relationship between parameters of inbound logistics performance of Safaricom Limited and the four variable of lead time.

Table 2: Multiple Regression Analysis

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	0.50242	1.577		19.500	.000
Production lead time	0.22768	0.80	0.9489	9.057	0.02
Shipping lead time	0.27172	0.10	0.23.023	7.115	0.01
Customs brokerage TAT	0.19505	0.204	0.15765	5.537	0.01
Receipt & inspection of goods velocity	0.27335	0.0674	0.22327	11.025	0.02

Dependent variable: Inbound Logistics performance

As per the SPSS generated table, the final equation on the relationship between lead time variability and inbound logistics performance becomes,

$$Y= 50.242 + 22.768X_1+ 27.172X_2 + 19.505X_3+ 27.335X_4$$

Where X_1=Production lead time, X_2= Shipping lead time, X_3= Customs brokerage TAT and X_4= Receipt and inspection of goods velocity.

According to the regression equation established, taking all factors (production lead time, shipping lead time, and customs clearance turnaround time and receipt and inspection velocity), constant at zero, inbound logistics performance would be at 50.242%. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in production lead time will lead to 22.768% increase in inbound logistics performance; a unit increase in shipping lead time will lead to a 27.172% increase in inbound logistics performance; a unit increase in customs clearance turnaround time will lead to 19.505% increase in inbound logistics performs of Safaricom, while a unit increase in receipt and inspection velocity will lead to 27.335% increase in inbound logistics in Safaricom Limited.

These results infer that shipping lead time contributes more to Inbound logistics performance of Safaricom Limited, followed by receipt and inspection of goods and services, then production lead time and customs brokerage turnaround time least contributes to Inbound logistics performance of Safaricom Ltd. At 5% level of significance and 95% confidence levels, all the four independent variables were statistically significant in influencing inbound logistics performance of Safaricom Limited.

The coefficient of determination, r2 is the square of the sample correlation coefficient between outcomes and predicted values. As such it explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (inbound logistics performance) that is explained by all the four independent variables (production lead time, shipping lead time, customs clearance turnaround time as well as receipt and inspection velocity).

The independent variables studies revealed that there exists strong relationships between inbound logistics performance of Safaricom Limited as represented by the R2 and the lead time variability elements. This therefore indicates the four independent variable contribute about 71.3% to inbound logistics performance of Safaricom Limited while other factors not under this study contributes 28.7% of the inbound logistics performance of Safaricom Limited. The table below illustrates the findings.

Table 3: Model Summary for the combined regression model

Model	R	R Square	Adjusted R Square	Std. Error	Durbin-Watson
1	.844[a]	.713	.611	3.015	2.004

[a]Predictors: (Constant), Production lead time, shipping lead time, customs brokerage turnaround time, receipt and inspection velocity

Durbin Watson statistic is a test statistic used to detect the presence of auto correlation in the residuals obtained from regression analysis. The statistic is usually between 0 and 4, where a value of 2 means there is no auto-correlation. Values approaching 0 indicate positive autocorrelation and values towards 4 indicate negative autocorrelation. One of the key assumptions in linear regression is there exists no auto correlation, hence the emphasis of the Durbin Watson statistic in this study. The resulting model had a value of 2.004 obtained which is very close to 2, an indication that the assumption of no auto-correlation was not violated.

SUMMARY OF FINDINGS

The main purpose of this study was to evaluate the effects of lead time variability on Inbound Logistics performance in mobile telecommunication companies in Kenya: a case of Safaricom Limited. The findings of the study were presented in accordance with the research questions. The research objectives formulated for the study were: to examine the effect of production lead time on inbound logistics performance at Safaricom Limited; establish the effect of shipping lead time on inbound logistics performance at Safaricom Limited; to assess customs brokerage time turnaround timelines impact on inbound logistics performance at Safaricom Limited and finally to determine the effect of receipt and inspection of goods velocity on inbound logistics performance at Safaricom Limited. Lead time variability was measured by use of four variables namely: Production lead time, shipping lead time, customs brokerage turnaround time and Receipt and Inspection velocity. Each of the four independent variables was captured as the average response to the factors identified as determining the performance of each of the variables. There were factors of lead time variability adjusted for in the study such as accessibility, incoterms and automations amongst others were largely categorical predictors measured on a likert scale. Important, to note is the fact that categorical variables cannot be entered directly into a regression model and be meaningfully interpreted. This therefore calls for dummy coding of categorical variables, a process which involves creating dichotomous variables from categorical variables. To summarize the multiple

response questions in SPSS, the researcher begun by defining the variable sets of interest using the multiple response command. This command allows analysis of a number of separate variables at the same time, especially in instances where a number of separate variables have a similar coding scheme all pointing to a single underlying variable.The variables were found to have a significant relationship and the independent variables explained the variation in the dependent variable. This shows that the variables were strongly related and that the decisions to outsource were dependent upon the identified factors. It is clear from the study that production lead time, shipping lead time, customs brokerage and receipt and inspection velocity have an impact on inbound logistics performance in Kenya.

Production Lead Time

The importance of lead time has increased and this can be attributed to several factors and most of these factors has been the recognition of organization spend and hence seeking to generating savings. The study established that when looking at the production lead time sub variables the element of Longer Materials Handling Time has the most impact followed by set-up time. Majority of the respondents felt that production lead time had a very high impact on inbound logistics performance. This means that the firm must seek to manage production lead time by working very closely with the suppliers. Failure to manage this variability can negatively impact on the inbound logistics variability this concurs with Rad 2008 who wrote that organizations that have focused on cycle time as a productivity measure can reduce delivery time and improve quality thereby creating a more satisfied customer. Variation in production lead time has a direct effect on the total lead time hence affect inbound logistics performance in terms of delivery time.

The study found that lead time management compels firms to be proactive and efficient in seeking ways to reduce variability as this has a direct effect on cost, quality and on time delivery. Production is done by suppliers and therefore collaboration and supplier relationship is key to ensure that goods are produced as scheduled and on time to avoid any unnecessary delays hence emphasis on supplier involvement.

Shipping lead time

The study also found that shipping lead time demonstrated the highest impact on Inbound Logistics Performance and of significance to the organization. Mode of shipment could delay delivery resulting to “Out of Stock” or aged stocks, in cases whereby organization has a performance bond in place delays in delivery could lead to hefty penalties. From the study, shipping mode has the highest effect on lead time followed by transit time and then accessibility. When therefore the organization is looking at shipping lead time crucial to confirm the mode intended to be used and transit time to be factored in from origin to destination. Short transit times and high schedule reliability are key factors for shippers and have become important objectives of such operators. Reliability was identified as the third most important topic after cost and the condition of goods on arrival, and has a higher importance than the frequency and speed of the service. Improvements in variability have different impacts, depending on the source of the variability. Relationship with the 3PL

enhances shipment follow up and ensuring that goods are booked out on the first available flight or vessel. The 3PL also assists in logistics planning and collection of shipment on time to ensure that shipments arrive at destination on time. Shipping lead time therefore is very critical to Inbound Logistics Performance of the organization.

Customs Brokerage TAT

The research answered the question that the researcher sought to respond to which was, does customs brokerage turn-around time affect Inbound Logistics Performance. Yes it does, majority of the respondents indicated that the customs brokerage turnaround time had a high effect on inbound logistics performance. The leading aspect of customs clearance that leads in variability is automation closely followed by regulations and then incoterms. Red tape leads to longer customs brokerage turnaround time which has a direct effect on cost as demurrage charges have to be paid as well as delayed deliveries which could result to lost sales. The organization imports required equipment and items for operation and goods cleared through customs. Therefore this is a huge contributor to both delayed deliveries and costs.

It was found that bureaucracy plays a key role, the organization should ensure that documentation accuracy and completeness is checked prior to ship so as to minimize delays. This can be done by way of supplier engagements and need to educate the exporters on the import requirements. It is imperative to note that customs authorities in Kenya continue to simplify the process by automation but it is the importer's responsibility to ensure understanding of the process. The study deduced that choice of incoterms also had an effect on the customs clearance turnaround time, it is therefore crucial to have the sourcing team in the organization negotiate for incoterms that are suitable for the business and where possible pass the responsibility of freight and delivery to the supplier.

Receipt and Inspection of goods velocity

Receipt & Inspection of goods being the last leg in the inbound logistics must be handled with speed and accuracy to ensure availability of stocks for use or sale. Under receipting and inspection velocity the study looked at sub variables of planning, unloading speed and capacity. The most critical or highest contributor is b planning, followed by capacity and thereafter unloading speed. Before a consignment arrives a plan must be in plan to ensure that available resources are in place and space is available to store the goods. There should also be sufficient labour to unload in order to detain trucks leading to costs. Equipment availability for unloading can also speed up or slow, organizations seek to invest in equipment that will minimize handling and human intervention as well as to ensure safety during the process of unloading. This therefore is critical is a crucial lead time component to inbound logistics performance. Key finding in this research is that of collaboration, if all the functions collaborate from planning, sourcing, supplier relationship, 3PL up to the last mile delivery, inbound logistics performance is then improved.

CONCLUSIONS

The study concludes that Safaricom has achieved a given degree of managing lead time variability. This is evident from the from supplier portals where some extent of information sharing is done as well as engagement of a competitive logistics service provider. This is also supported by the fact of the collaboration that the other business units engages with the inbound logistics function. This is a demonstration of inbound logistics being a key function. The study concludes that lead time variability elements in production lead time; shipping lead time; customs brokerage turnaround time; receipt and inspection velocity have a significant effect on time delivery as a measure of inbound logistics performance.

The study also concludes that lead time variability elements in production lead time; shipping lead time; customs brokerage turnaround time; receipt and inspection velocity have a statistical significant effect on quality as a measure of inbound logistics performance. Among these findings is the realization that in a fast paced telecommunication sector the elements of lead time variability have a direct impact on cost, on time delivery and quality which are measures of inbound logistics performance. It is important to recognize that to achieve competitive advantage in an ever increasingly competitive industry and rising cost of doing business, decision makes need to improve in management of lead time variability which have an impact on the inbound logistics performance.

An extended lead time or is one of the major problems in inbound logistics, the prevailing factors behind this are mostly related to the efficacy of production, shipping, customs brokerage turnaround time and receipt and inspection velocity. But the development of the production and manufacturing system can be implemented in a short while and it has a proven impact on the lead time. Imports from abroad takes up to 60 days of the lead time which is roughly 45% of the average lead time. It is important for an organization therefore to be able to manage the lead time right from the supplier to delivery into the warehouse. The findings allowed the researcher to conclude also that whatever improvements are made to the inbound logistics will also impact on the operational performance of the business, while failures in the inbound logistics will do so negatively. Business endeavors to maximize revenue and minimize costs are directly affected by the inbound logistics' activities.

RECOMMENDATIONS

The study recommends that factors that lead to lead time variability need to be looked into with a view of managing the variability as this has effect on the overall inbound logistics performance. There is need for every organization or supply chain to establish sources of variability so that the variability can be reduced. This calls for serious attention to enable the organization focus on formulation of inbound logistics policies and achievement of the strategic pillar of operational excellence. Organizations need to find ways of reducing lead time variability so that lead time can be managed. Dealing with international suppliers, an importer must be aware of all sources of lead time variation including the production lead time, shipping lead time, customs brokerage turnaround time as well as receipt and inspection velocity. However Safaricom Limited needs to benchmark on its inbound logistics

performance against other industries such as Fast Moving Goods as in such organizations delivery has become an order qualifier.

Inbound Logistics is a key function in the organization since most of the respondents collaborate to a large extent with this unit it is therefore recommended that these relationships are enhanced for better communication and performance. The study recommends a strategic partnership with the 3PL as performance management is relevant in the organization therefore Safaricom must focus on ensuring that the service provider consistently meets the set KPIs and SLAs. In today's data rich world and with all the tools that are available, organizations should start to measure and track lead-time variability. Arising from this study, the recommendation is that, before engaging in outsourcing, the company with that intention should assess the impact of the outsourced services and/or goods on the performance of the supply chain. This is because cost, quality and delivery on time inbound logistics performance parameters are affected if lead time variability of production, shipping, customs brokerage and receipt & inspection velocity impact on the overall inbound logistics performance. Relationship with suppliers must be managed and Safaricom must seek to understand production schedules and lead times even though out of their control but must be managed as this has an impact on inbound logistics performance. This can be in form of shared information technology platforms for information sharing, joint planning as well as track and trace of the various orders to improve end-to-end visibility.

The study deduces that on time delivery has the highest impact on inbound logistics performance as opposed to the assumption that cost has the highest impact on inbound logistics delivery. This therefore calls for upscaling of capability of internal Safaricom Staff in matters logistics as currently main of the logistics activities are contracted to a Logistics Service Provider. With competent Logistics employees within the organization appropriate strategies and policies can be formulated which will drive to operational excellence which is one of the organization's strategic pillars. The variables under study gave s contribute about 71.3% to inbound logistics performance of Safaricom Limited while other factors not under this study contributes 28.7% hence the organization need to look at the other variables to address so as to ensure lead time variability is managed and performance is met as per the set goals.

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