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ROLE OF SUPPLY CHAIN COLLABORATION ON OPERATIONAL PERFORMANCE OF THIRD PARTY LOGISTICS SERVICE PROVIDERS IN KENYA

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Abstract

The general objective of this study was to establish the role of supply chain collaboration on operational performance of third party logistic service providers in Kenya. Specifically, the study sought to establish the influence of supplier collaboration on operational performance of third party logistic service providers in Kenya; and to determine the effect of customer collaboration on operational performance of third party logistic service providers in Kenya. This research was based on the resource based view theory, and stakeholder theory to explain the relationship between the study variables. The study collected primary data using questionnaires. A descriptive survey design was adopted. The target population included all the 43 third party logistic service providers operating in Kenya as at December 2020. A census was conducted on all the 43 third party logistic firms. The unit of observation was heads of procurement, operations and finance unit of each third party logistic firm. The total target was therefore 129 respondents. 84 questionnaires were completely filled giving a response rate of 65.12% which was considered adequate for the study. Information assembled was evaluated using descriptive and inferential statistics ranging from frequencies, percentages, correlation and regression. Findings reveal that the 3PL service providers have adopted supply chain collaboration (supplier, internal and customer) to a great extent. The study findings also reveal that supplier collaboration influenced operational performance positively. Further, results illustrate that customer collaboration influenced operational performance positively. The regression and correlation results support the results as there existed a positive and significant relationship between supplier, and customer collaboration with operational performance. The study recommends the need for having 3PL service providers keep adopting supplier collaboration, internal and customer collaboration as this will boost operational performance and lead to business success.

Introduction

In a global market, supply chain management is more complex since suppliers and partners are located in different countries and the classical logistics of facility location, sourcing, and distribution are greatly influenced by political and economic factors (Azadi, Saen & Zoroufchi, 2018). Organizations are constantly operating in an ever changing environment in the present business environment that is characterized by rivalry in globalization, competition, differentiation, the increased expectations and demands of different customers and performance-related issues (Sroka, Szántó, & Vveinhardt, 2018). The world economy has continued to be globalized and firms are exploring ways to survive in a competitive world by having efficient supply chain. As firms attempt to remain competitive within the market place, there are internal operational functions that must be improved continually (Kumara & Rahman, 2015).

The practice of supply chain collaboration in supply chain management has established itself as a successful and sustainable business operation (Prajogo & Olhager, 2017). Business-to-business relationships have virtually eliminated geographical and cultural barriers in international supply chain and reduced the time to market for goods and services (Yaakub & Mustafa, 2015). This has resulted in high revenues due to the elimination of middlemen and high sales (Hadjikhani & LaPlaca, 2017). In the last few years, Kenya has experienced a gradual development of internet usage and subsequent growth of Information and Communication Technology (ICT) firms. Emerging economies in Asia and Africa have not been left behind in this Internet revolution, with most small and medium firms beginning to see the benefits of B2B e-commerce in economic development.

Supply chain collaboration main objective is to focus on improving the efficiency of inter-organizational supply relationships, entirely from source to consumer with particular emphasis on the interfaces of the different operations in the supply chain (Montoya-Torres & Ortiz-Vargas, 2016). Information and communication technology (ICT) infrastructure has long been hyped as the driver of supply chain collaboration mechanisms within supply chains world over (Prajogo & Olhager, 2017). It is assumed that collaborating partners in the supply chain are all focusing on the same goals of relaying goods and services to customers at the lowest cost possible (Hudnurkar, Jakhar & Rathod, 2017). This unity in purpose enables the supply chain partners to streamline their processes to eliminate duplication, improve communications and adjust their operations to achieve efficiency (Cai, Jun & Yang, 2017).

Despite supply chain collaboration having been studied in the past decade, the subject still gathers interest due to its multidimensional nature. According to Kim (2018), supply chain collaboration approaches are supplier, consumer and internal collaboration. Yaakub and Mustafa (2015) refers to supplier collaboration to be process in which the organization and the supplier share apply operating, knowledge and financial for mutual benefits; whereas, customer collaboration as the process in which organizations identify, explain and use consumers to produce output that meet their desires and that satisfy and maximize their expectations; and internal collaboration is the process and practice of merging and developing internal resources for sharing information and knowledge within and outside the organization functions with an aim of helping external collaboration and achieving goals.

Operational performance entails having an efficient flow of operations in the organization such as reducing delivery lead time, reducing inventory and ensuring optimal level in the machines (Zhu, Sarkis & Lai, 2018). In order for organization to be competitive they have to make use of the different performance objectives. They are the cost, quality, speed, dependability and flexibility In order for the firms to strive to remain competitive through supply chain collaboration, an understanding of the complexity and dynamism of operational performance of these firms has potential to provide the platform upon which the success or failure of this important industry could be judged.

Supply chain collaborative relationships can deliver a wide range of benefits which enhance competitiveness and performance of supply chain partners (Hudnurkar, Jakhar & Rathod, 2017). Some of these benefits are; innovative products, cost management, improved efficiency and risk management as well as delivering incremental business value to customers (Giannakis & Papadopoulos, 2016). Effective supply chain collaboration can create an environment that promotes trust between organizations based on a shared understanding and communication that promotes B2B relationship (Lavastre, Gunasekaran & Spalanzani, 2019). However, there are

costs associated with supply chain collaboration that need to be considered, that is, internet connectivity, technology cost, risks, process change and overhead costs (Soosay & Hyland, 2015).

Global Perspective of Supply Chain Collaboration

There is growing recognition that in agile supply chains, individual organizations no longer compete as stand-alone entities, but rather as whole supply chains. In agile supply chain, a confederation of partners is linked together as a network. Gradually, it is becoming an era of "network competition," where the orders will go to those organizations who can better structure, coordinate, and manage the relationships with their partners in a network committed to better, closer, and more agile relationships with their final customers (Andersen et al., 2019).

According to Sajad Fayezi and Maryam Zomorrodi (2015), on the role of relationship collaboration in supply chain agility and flexibility development, an Australian perspective, contributed into an understanding of the manufacturing companies' implementation of relationship collaboration with respect to decision trade-offs involved in contract design. The findings revealed the significant perceived importance and the impact of relationship collaboration on supply chain agility and flexibility development. Further, it was found out that practitioners perceive both supplier and customer relationships as important factors affecting performance of their firms.

Dotun (2017) focused on supply chain collaboration in 171 organizations drawn from 3 rapidly developing countries; Brazil, India and China. They found out that supply chain relations and collaborations relate positively to both product and process innovative capabilities relate positively to manufacturing performance. The findings provide new insights into manufacturers in the three countries and shows that the supply chain collaborations they build with their customers have encouraged them to develop new innovative capabilities. These new capabilities in turn have enabled them to reap benefits of improved manufacturing performance.

In Thailand, Wong, Boon-Itt and Wong (2017), argue that under environmental uncertainty, the relationships between supplier/customer collaboration and delivery and flexibility performance and those between internal collaboration and product quality and production costs are high. The supply chain of Chinese companies transcends different countries in different continents making this country one of the increasingly focal point of manufacturing. As a result of this development in the supply chain processes, manufacturing firms in the country are heavily reliant on access to timely and accurate market information (Zhu & Sarkis, 2018).

Regional Perspective of Supply Chain Collaboration

In Africa, many developing countries are yet to adopt the information exchange between supplier-customer relationship, although the ones that have adopted the system are facing challenges of information exchange between supplier-customer and also supplier-firm which is acting as a barrier to performance of the business operations. Countries like Ghana and South Africa have adopted proper information exchange in tour companies. This has helped the companies to manage the supply operations properly hence increasing productivity of the companies and also making the tour industry to be profitable (Chopra & Meindl, 2018).

In Ghana, Otchere, Annan and Anin (2018) argued that supply chain collaboration creates a competitive advantage among the cocoa manufacturing firms. They argued that since suppliers and retailers have knowledge in different domains, the combination can create unique knowledge that can be applied to improve business knowledge. Better relationships between retailers and

their suppliers also improve prospects of new product acceptance. They argued that effective use of relevant and timely information by all functional elements within the supply chain is key to any organization and also provides a distinguishing factor for that particular organization.

Among South African firms, Laursen and Salter (2016) argued that strategic partnering has become key in the current global market. Organizations have been forced to collaborate with other firms through joint supply chains that focus on joint planning, coordination, and process collaboration between the organization, its suppliers, its customers, and other supply chain partners. Supply chain integral relationships offers the South African firms advantages of business expansion to other areas, increased return on assets, improved customer service, reduced lead times, increased reliability and responsiveness to market trends, and a shorter time to market.

Local Perspective of Supply Chain Collaboration

According to Kemunto (2017), asserts that in Kenya there are about 226 Multinational Corporations according to Kenya Beaural of Statistics. Majority seem to have collaborated the supply chain. Despite these benefits, many firms in developing countries are striving to cope with management of individual functions instead of integrating activities into key supply chain processes. In addition, only a few firms have adopted and successfully implemented the concept of integral relationships in Kenya (jointly planning, controlling, and designing a supply chain (Cook, Heiser & Sengupta, 2019). In Kenya for instance there are many times when there are sudden increases especially in fuel and sugar prices due to shortages. This is a direct effect of poor collaboration of supply chain systems.

According to Katua (2016), the manufacturing firms in Kenya have sought to adopt better supply chain practices to significantly enhance supply chain coordination. It is on this background that these firms have considered application of supply chain collaboration as a means of attaining superior performance with regard to supply chain process. Application of supply chain collaboration by the manufacturing companies in Kenya has spurred accomplishment of the organizations' strategic goals, decrease in risks as well as enhancement of internal and external synchronization of management process.

According to Chirchir (2015), supply chain collaboration relationships among commercial banks in Kenya has seen adoption of practices such as information sharing so as to respond to customer requirement, enhance the product availability, and efficiently coordinate processes in order to lower the costs, offer better customer service, improved revenues, and have properly guided capacity plans. According to Kibera and Wairimu (2016) supply chain collaboration at Bidco Oil Refineries helps improves firms capability because it provide a systematized way to keep up with processes, it provides cost savings, improves efficiency. In addition, it enhances flexibility and tight inventory management that eventually leads to higher profits margins and competitiveness.

Statement of the Problem

Third party logistic service providers globally have incorporated the need of having cooperative and mutually beneficial supply chain partnerships due to the increased global competition as it's an enabler of operational excellence (Braunscheidel & Suresh, 2019). However, there are challenges facing supply chain collaborations. Lack of trust between associates of the supply chain within an organization leads to ineffective cooperation within the supply chain link thus difficult in cooperation (Fawcett, Jones & Fawcett, 2018). The lack of a common goal and interests within the partners also inhibits collaboration (Sambasivan, Siew-Phaik, Mohamed, &

Leong, 2015). Simchi-Levi, Kaminsky and Simchi-Levi (2018), observed poor performance, high operation costs, reduced service level, low utilization of resources, and not responding to customers' expectations are because of lack of supply chain collaboration in organization activities. Thus the need of 3PL firms to collaborate their supply chains.

The level of competition in the 3PL industry has reached a high level, and there is therefore the need for these firms to explore other avenues from which their performance can be increased. One of the strategies being employed by firms is collaborative relationships and supply chain agility, both upstream and downstream in order to enhance their level of competitiveness and eventually operational performance. This will require the development of an effective collaboration between the players in the supply chain. Several studies have been done in the area of supply chain in Kenya (Bolo & Wainaina, 2016; Barasa, Simiyu & Iravo, 2015; Kingoo, 2015; Ong'olo & Odhiambo, 2016; Ombati, Kirochi & Nyagari, 2015; Rodah & Karanja, 2016).

In Kenya, the logistical/transport sector contribute 5 to 15% to the GDP. This has prompted the Kenyan government to realize the strategic role of logistics to the economy and the region. Thus establishing the Kenya Transport and Logistics Network (KTLN). Third party logistical firms play a pivotal role in enabling the transport and logistics networks as they command 38% percent of the market share in the sector. With multiple parties being involved in supply chain operations, collaborative efforts ought to be considered as a driver of operational success. However, there has been limited research conducted on supply chain collaboration and the operational performance of 3PL firms in Kenya. This shows that limited attention has been paid to supply chain collaboration and operational performance in Kenya. This study therefore intended to fill the existing conceptual and knowledge gaps. Conceptually, there is no consensus on how the various types of supply chain collaboration influence operational performance. Contextually, 3PL firms play a critical role in the Kenyan economy and therefore need to enhance their operational performance.

Research Objectives

1. Establish the influence of supplier collaboration on the operational performance of third party logistic firms in Kenya.
2. Find out the influence of customer collaboration on the operational performance of third party logistic firms in Kenya.

Theoretical Review

Resource Based View

Barney (1991) advocated the Resource Based View (RBV) theory. This theory advocates that an organization should strive to make best use of the available capabilities within the organization. Capabilities are hereby described as the physical resources, human capital, and organizational resources possessed by an enterprise that can be used to comprehend and execute tactics (Ketchen, Barney & Wright, 2011).

For an organization's resources to be valuable they must possess four unique characteristics which are Valuable, Rare, Imitable and Non-subtitutable (VRIN) (Barney, 1991). These characteristics make the resources of an organization to give it a competitive edge over their rivals. Valuable in this regards means that the resources are in a position to command value to the firm and thus bring up a competitive advantage. Rare in this regard means that the resources have to bring up an exclusive tactic to bring a competitive advantage over the competitor. The resource must not be present with the competitor to have a competitive edge. Inimitable in this

case means that for a resource to be a source of competitive advantage, competitors must not be able to obtain it. Non-subtitutable resource means that a resource should not be able to be replaced by any other strategically comparable valuable resource (Barney, 1991).

The RBV theory is related to this enquiry because it emphasizes on the supply chain partners to combine different mix of resources in order to ensure the firm operate efficiently. Thus, this theory suggests that in order to enhance operational performance there is need of combining a mix of the firm's resources so as to ensure the organization achieve competitive advantage over its competitors thru' collaboration of the supply chain members.

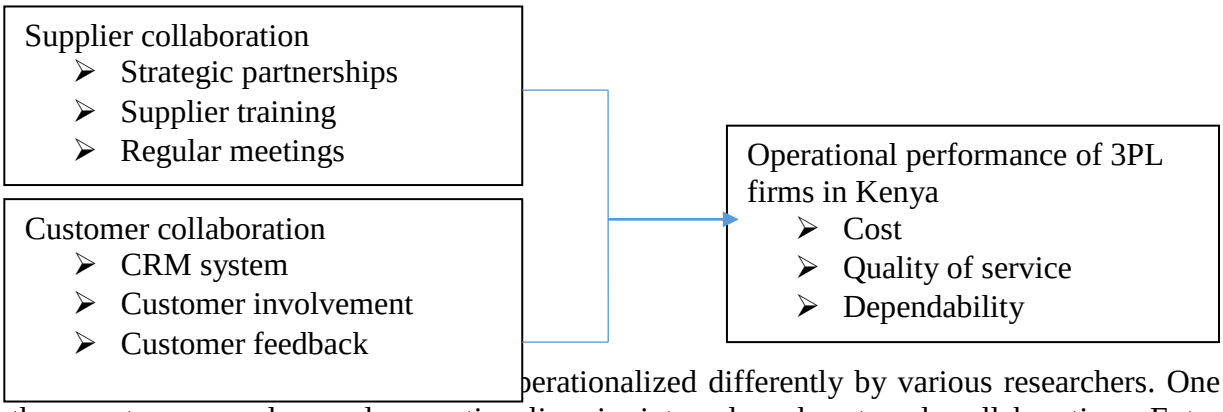
Stakeholder Theory

Stakeholders' theory has its origin from Freeman (1984) as cited by (Fontaine, 2006). Stakeholder theory contends that firms produce externalities that affect many stakeholders which are both internal and external (Lavassani & Movahedi, 2010; Reuter, Goebel & Foerstl, 2012; Freeman, 2010). Externalities often cause stakeholders to increase pressures on firms to decrease negative impacts and increase positive impacts (Sarkis, Gonzalez-Torre & Adenso-Diaz, 2010). Stakeholder theory further states that organizations are responsible toward various stakeholders since they are expected to react to their different claims as an attempt to legitimize their existence (Freeman, 2010; Park-Poaps & Rees, 2010). This theory also suggests that firms are rooted in a network of relationships with stakeholders and that these firms allocate varying amounts of resources and attention to these stakeholders (Parmar *et al.,* 2010).

This theory exists in the context of the basic premise that internal and external groups will influence organizational practices; externalities may be internalized via stakeholder pressures between supply chain partners (Björklund, 2010; Freeman, 2010). Since stakeholders are usually closely associated with social organizations, hence the confounding relationships with institutional theory could exist. This is so especially if there are norms and legitimacy aspects of stakeholder theory that go beyond institutional theory (Reuter, Goebel & Foerstl, 2012; Björklund, 2010).

Even though unique perspectives have been implemented through other theories such as sphere of influence, where the firm's field of influence may impact supply chain partner environmental initiatives and innovations (Sarkis *et al.,* 2010; Matos & Hall, 2007). Globally-centered stakeholder theory could be more relevant as globalization of supply chain collaboration have triggered the stakeholder field to continue growing (Björklund, 2010). Significant investigational opportunities still exist with respect to the roles of stakeholder theory and pressures on supply chain collaboration (Lavassani & Movahedi, 2010; Sarkis *et al.,* 2010). Therefore, the stakeholder engagement is expected to affect how supply chain partners engage each other (Park-Poaps & Rees (2010). This theory will be used in this study to support the considerations in developing a supply chain planning collaboration strategy, which is predominantly concerned with the fulfillment of customer orders.

Conceptual Framework



perationalized differently by various researchers. One of the most commonly used operationalize is internal and external collaboration. External collaboration is further divided into supplier collaboration and customer collaboration. This section discusses these forms of collaboration.

Supplier Collaboration

The Supplier collaboration is the practice by which organizations collaborate and interact with suppliers in ensuring an effective flow of the supplies. According to Vijayasarathy, (2020) it involves organization collaborating with the upstream suppliers. According to Petersen (2015), organizations are able to source for information from suppliers and help in making decisions.

According to Danese (2018), suppliers provide information to organization on the firm's production schedule, quality, design, and direct quality improvement programs. It aims to help the organization have an efficient operation by ensuring the smooth stream of materials and prevent hurdles in the procurement and production process. Thus organizations are able to develop collaborations with suppliers which can be used to collaboratively exchange knowledge and information.

Koufteros, Vonderembse and Jayaram (2015), Nagamachi Liker and Kamath, Watsi (2016) and Ragatz, Peterson and Handfield (2017) studies established that the organization to be considered to have an effective supplier collaboration, it should link its information systems with suppliers to ensure free flow and real-time access of information. Collaboration between the organization and supplier improves operational performance objectives of cost, distribution, flexibility and the quality (Wong & Wong, 2017).

Customer Collaboration

Westbrook and Frohlich (2018) both established that it is the manner by which organizations interact with customers to get their feedback about the goods and service offered. According to Fisher, Hammond, and Obermeyer (2018), customer collaboration is aims in improving demand planning and visibility in organizations. According to Kim (2018), customer collaboration involves using customers to identify and clarify their needs and produce products that meet them and maximize their expectations and satisfaction.

According to Lotfi, Sahran, Zadeh and Mukhtar (2018) customer collaboration involves organizations incorporating customer opinions in their production process and ensuring the link between the customer and manufacturer is efficient and effective. According to Kim (2018) the accuracy of information about customer demand helps the organization to improve forecasting

and lower the total inventory costs. Customer collaboration helps organizations have a understand customers' needs, tastes and preferences (Frohlich & Westbrook, 2018; Swink, Narasimhan & Wang, 2017).

Operational Performance of 3PL Firms in Kenya

Performance is the nature and quality of an organization's behaviors to complete their main tasks and functions and to generate profit and there are two core dimensions of business performance: operational and financial performances (Chavez *et al.,* 2018). Operational performance relates to a company's performance in serving customers in terms of quality, flexibility, on time delivery (Wang *et al.,* 2017). Operational performance can be further classified into cost and service performances where service performance is also commonly used in measuring operational service performance in terms of the quality of the service, on-time delivery, and flexibility of the service (Daugherty *et al.,* 2018).

Zhu and Sarkis (2018) distinguished that organization's operational performances are measured against set indicators or performance objectives. Organization output is measured through performance a measure of manufacturing cycle time, and reliability, which influences the customer satisfaction and market share (Voss, Åhlström, & Blackmon, 2017). According to Slack, Chambers and Johnston (2017), cost, flexibility, dependability, speed, and quality are the main performance objectives for an organization and which are aligned towards customer satisfaction requirements.

Operational performance entails having an efficient flow of operations in the organization such as reducing delivery lead time, reducing inventory and ensuring optimal level in the machines (Zhu, Sarkis & Lai, 2018). In order for organization to be competitive they have to make use of the 5 different performance objectives. This study will focus on the cost, quality and dependability operational performance objectives among the 3PL firms in Kenya.

Empirical Literature Review

Supply Chain Collaboration

Collaboration has been referred to as the driving force behind effective supply chain management and may be the ultimate core capability in modern global economy (Trkman et al., 2015). Supply chain collaboration is regarded as a key pillar of supply chain management (Al-Abdallah, Abdallah & Hamdan, 2019). Previous studies have viewed supply chain collaboration as the main route to sustainable competitive advantage (Al-Zu'bi, Tarawneh, Abdallah & Fidawi, 2015). Zhao et al. (2019) contend that successful internal collaboration promotes collaboration with supply chain partners.

Supply chain collaboration can enhance value addition to firms by reducing order turnaround time, reducing costs, improving response time to customers, or leveraging resources and improving innovation (Hui, He-Cheng & Min-Fei, 2015). Kim and Lee (2018) posit that the main goal of management should be to elicit collaborative service to supply chain partners in general and customers in particular, so that it can manage relationships within the supply chain in a value creating way. The rise of supply chain management reinforces the incentive for developing supply chain collaborations between suppliers, manufacturers, logistic service providers, distributors and customers so as to improve performance (Halldórsson, Hsuan & Kotzab, 2015; Fawcett, Stephen & Amydee, 2018).

Tactical supply chain relationships are seen as vital to high performance and budding innovation capacity to meet both supply and demand as globalization force changes in market and organizational operations (Al-Zu'bi, 2016). Supply chain collaborations are strategically crafted by organizations to attain resultant competencies that guarantee sustainable competitive advantage through innovation capacity of the supply chain (Veerendrakumar & Shivashankar, 2015). Palmatier and Crum (2020) argue that supply chain collaboration has a positive impact on the bullwhip effect, supply chain flexibility and inventory costs. While Simatupang and Sridharan (2015) identified three major dimensions in supply chain collaboration as: incentive alignment, information sharing and decision synchronization. Kim (2018) operationalized supply chain collaboration approaches as supplier, consumer and internal collaboration. Each of this is discussed in detail in this review.

Supplier Collaboration

Supplier collaboration is reliant on the firm collaborating with the suppliers regarding information sharing; the supplier offers two-pronged purposes of providing the products required by the firm and sharing their expertise and knowledge for a syngeneic relationship with a view of meeting the customer expectations (Narasimhan et al., 2017). Supplier collaboration involves collaboration, coordination and information sharing activities between the firm and the suppliers with the aim of synchronizing the firm information into vendors' processes, capabilities, constraints and ultimately enabling more efficient planning, forecasting, product, process design, and transaction management (Schoenherr & Swink, 2018; Narasimhan, et al., 2017). Yuen and Thai (2017), argue that when firms recognize suppliers as a critical strategic partner has an enormous stake in their overall vision, they can easily break the static and restrictive public procurement policy imposed practices to add value to the process

A close relationship between the organization and its suppliers enables the suppliers understand the organizations needs and be able to adapt to changing requirements in a timely manner. There is increased information exchange between the organization and its suppliers which helps reduce waste and improve delivery performance as production planning can be accurately done (Flynn et al., 2018). Supplier collaboration is therefore developing joint collaboration with suppliers of the organization so as to better manage inter-firm business processes and enhance collaboration in planning and joint product development (Wong et al., 2017).

Supplier collaboration involves information sharing and coordination of activities with key suppliers so as to provide the organization with insights to supplier processes, capabilities and constraints which enables improved transaction planning, enhanced product and process design as well as effective planning and forecasting (Schoenherr & Swink, 2018). According to Das et al. (2016), information sharing has been enabled by mechanisms that support collaboration. These include electronic data interchange, application software like supply chain optimization software and ERP systems, together with web based collaboration systems. Coordination has been enabled by supplier relationship development, cross functional involvement and joint problem solving. These mechanisms result in capability development which in turn leads to creation of organizational resources which give the organization competitive advantage according to the RBV theory.

Developing partnerships with suppliers enables them to better understand the organization and be able to anticipate its needs. The mutual exchange of information on products helps the organization develop production plans and produce goods on time hence improving on their

delivery performance (Flynn et al., 2018). The relational ties created by knowledge based collaboration enables flexibility and gives the organization capability to adapt in uncertain environments. As a whole supplier collaboration reduces transaction costs due to increased coordination and information sharing. It also enables speedy decision making as more information is made available (Das et al., 2016). According to the RBV theory, creation of cross functional teams promotes knowledge transfer between organizations which may otherwise not be easily transferred hence encouraging joint problem solving (Das et al., 2016). This enables the organization to produce higher quality products and services that are more responsive to customer requirements based on the interactions encouraged by integrating resources.

Fawcett and Magnan (2018) found in an empirical study among managers from purchasing, manufacturing and logistics in the USA that supply chain practice seldom resembles the theoretical ideal. The data indicate that most organizations were at early stages of interorganizational collaboration. Very few, if any of the organizations were managing the entire supply chain from suppliers' supplier to customers' customer. In most cases, the responsibility for managing second-tier suppliers was handed over to first-tier suppliers. Zhang, Gunasekaran and Wang (2015) sought to develop a conceptual collaboration model which consists of comprehensive elements that are important to academic research and industrial practices. They found that efficient supply chain collaboration placed all essential resources of all cooperating partners together and linked all functional processes in order to effectively use resources. The goal is to operate the whole supply chain as a corporate entity, to achieve effective and efficient flows of products and services, information and knowledge, finance and decisions so as to provide maximum value to the customers at low cost and high speed.

Customer Collaboration

Customer collaboration is collaborating with the firm's customers through the sharing of information to meet the customer's requirement and expectations (Zhao et al., 2019; Wong et al., 2017). Customer collaboration comprises of strategic information sharing besides collaboration between the firm and customers with the primary objective of improving visibility through the provision of strategic insights into market expectations and opportunities (Schoenherr & Swink, 2018). Additionally, a firm that is fully integrated with its customers stands to benefit through quick problem resolutions, timely tasks coordination, cost, and reduction of inventories, resolving of quality issues in good time and reduction in waste (Wong et al., 2017).

By integrating with its customers, the organization can improve the accuracy of its demand information which helps in the product design process. There is also increased responsiveness to customer needs which leads the organization to produce higher quality products at reduced costs and more flexibly (Flynn et al., 2018). Customer collaboration is the close collaboration and information sharing developed with key customers so as to provide the organization with strategic insights on opportunities and market expectations (Wong et al., 2017). Therefore, with external supply chain collaboration, organizations are able to design products faster, with high quality and at lower cost compared to a single organization on its own (Näslund, 2017).

Customer collaboration is supported by the RBV theory which focuses on resources that give the firm competitive advantage as they present a product offering that is desired by the customers (Leuschner et al., 2018). Due to information sharing, quality of products and services may be improved in accordance to feedback from customers or market demand through technological investments made by the organization. This is also supported by the findings of Narasimhan et

al. (2017) who state that customer collaboration affected quality and new product flexibility. The increased interaction with the organizations customers enables it to refine the product as well as change products to suit the customers requirements.

The critical activities of customer collaboration are coordination, process synchronization and information sharing (Zhao et al., 2019) which lead to increased efficiency within the supply chain enabling on time delivery of service hence improved customer satisfaction. Flexibility is also enhanced as there is timely information exchange which enables the organization adopt to the changes in customer demands (Koçoğlu et al., 2018).

Gimenez and Ventura (2015) found that internal collaboration and customer collaboration influence each other and that both impact the performance of the organization. However, their study focused on internal collaboration in terms of dyadic interface between logistics and marketing, and logistics and production. Their study viewed external collaboration in terms of customer collaboration only and did not consider supplier collaboration.

Research Methodology

This investigation embraced a descriptive cross-sectional survey.The unit of analysis was the 43 firms while the unit of observation were the heads of procurement, operations and finance in the 43 3PL firms in Kenya giving a total of 129 top management employees selected for the purpose of this study. The enquiry used a cross-sectional survey of 129 respondents who were the unit of observation.

This research embraced first-hand information that was assembled by aid of issuing of questionnaires. Data analysis takes many forms but this research analysed the quantifiable data using numerical approaches that ranged from descriptive statistics such as percentages, mean, coefficient of variation and standard deviation. Inferential statistics such as correlation and regression analyses were also used. The most appropriate software recommended by Mackey and Gass (2015) was the SPSS version 24.

Research Findings And Discussion

Out of the 129 issued questionnaires to the target respondents, only 84 responses were made with adequate information and returned which translated to an overall 65.1% study response rate. This is in line with Neil (2009), who stated that a study with 50% response rate and above is sufficient for analysis and making conclusions.

Descriptive Statistics

Supplier Collaboration

The mean and standard deviation for the specific attributes of supplier collaboration are as presented in Table 1. Results demonstrate that the 3PL service providers had adopted supplier collaboration to a great extent. This is supported by the fact that on a five-point likert scale, the mean scores for attributes related to supplier collaboration was greater than 3.

The respondents agreed that strategic partnerships exist between them and suppliers, the organizations train their suppliers, the organizations considers views of their suppliers, supplier relationship has helped in improving procurement management and that the organizations shares information with suppliers. Further, the respondents also agreed that their organization holds regular meetings with suppliers to review the business issues, the suppliers meet the

organization's required specifications such as inputs, the organization's information system are linked with those of suppliers and that there is quick ordering system with major supplier. The statement that the organization's information systems are linked with those of our suppliers had the highest mean implying the most agreement while the statement that the organization considers the views of their suppliers had the lowest mean.

Table 1: Descriptive Statistics for Supplier Collaboration

Statement	Mean	Std. Dev
Strategic partnerships exist between them and suppliers.	3.95	0.93
The organization trains its suppliers.	3.86	1.15
The organization considers views of their suppliers.	3.24	1.32
Supplier relationship has helped in improving procurement management.	4.04	1.00
The organization shares information with its suppliers.	3.75	1.08
The organization holds regular meetings with suppliers to review the business issues.	3.52	1.29
The suppliers meet the organization's required specifications such as inputs.	4.24	0.55
The organization's information system are linked with those of our suppliers.	4.21	0.73
There is quick ordering system with major supplier.	4.03	0.63
Average	**3.87**	**0.97**

Customer Collaboration

The mean and standard deviation for the specific attributes of customer collaboration are as presented in Table 2. Results demonstrate that customer collaboration is being practiced by the 3PL service providers to a great extent. This is supported by the fact that on a five-point likert scale, the mean scores for attributes related to customer collaboration was greater than 3.

Table 2: Descriptive Statistics for Customer Collaboration

Statement	N	Mean	Std. Dev
The organization has a computerized system for ordering customer.	84	3.43	1.35
The organization uses of effective communication with customer.	84	3.23	1.47
Customer needs and satisfactions are our competitive strategies.	84	3.25	1.38
The organization makes use of different internet platforms to engage with customers.	84	4.00	0.55
The organization invites customers to participate in the design of new products and services.	84	3.91	0.67
The organization shares available inventory with the major customers.	84	3.82	0.80
Customer feedback is used to improve customer relations, processes, products and services	84	3.85	0.78
Customer data is systematically collected into an integrated database.	84	3.97	0.58
The organization uses systematic processes for handling complaints	84	3.82	0.83
Average		**3.70**	**0.93**

The descriptive statistics regarding customer collaboration reveal that the organizations makes use of different internet platforms to engage with customers, the organizations invites customers

to participate in the design of new products and services, the organizations shares available inventory with the major customers and that customer feedback is used to improve customer relations, processes, products and services. Further, the organizations have a computerized system for ordering customer, they use effective communication with customer, customer needs and satisfactions are their competitive strategies, customer data is systematically collected into an integrated database and that the organizations uses systematic processes for handling complaints.

Operational Performance

The mean and standard deviation for the specific attributes of operational performance are as presented in Table 3. Results demonstrate that operational performance had improved to a great extent. This can be explained by the fact that the average mean score for all the measures of operational performance was more than 3. From the descriptive statistics it was revealed that supply chain collaboration had the greatest impact on quality, followed by cost and dependability as shown by means of 4.03, 3.91 and 3.83 respectively. The fact that all the five measures of operational performance had means greater than 3 implies that the respondents agreed on the fact that operational performance is influenced by SCC.

Table 3: Descriptive Statistics for Operational performance

Statement	**N**	**Mean**	**Std. Dev.**
Cost			
The organization is works on economy of scale (large-scale production to reduce the cost per unit).	84	3.88	0.87
The organization provides cost effective service to customer.	84	4.12	0.87
Internal collaborations reduces administrative costs.	84	4.29	0.81
SCC reduces the average unit manufacturing cost.	84	3.42	1.13
SCC helps the organization reduce the inventory to minimum level to the extent that does not hinder the continuation of work	84	3.85	0.78
Average		**3.91**	**0.89**
Quality			
SCC has lead the organization to choses their suppliers on the basis of high-quality.	84	4.21	0.73
SC integration has assisted in improving the quality of goods, works and services offered to the beneficiary.	84	4.03	0.63
The adoption of supply chain collaboration has greatly enhanced product quality.	84	3.55	0.86
Internal collaboration leads to proper storage conditions according to the specifications.	84	4.45	0.50
Internal collaboration leads to an increased quality information sharing in order to enhance operational efficiency.	84	4.33	0.53
SCC has increased customer satisfaction levels.	84	3.85	0.78
Integration with suppliers have enhanced more conformity with technical set specifications	84	3.97	0.58
Customer collaboration leads to improved product quality and variety.	84	3.82	0.83
Average		**4.03**	**0.68**

Dependability			
The firm introduces new products from competitors to ensure competition.	84	3.68	0.97
The organization quickly modify products to meet major customer's requirement.	84	4.04	0.84
The organization provides a high level of customer service to its major customers.	84	4.12	0.88
There is high response to dynamic customer needs.	84	3.54	0.97
SCC helps organization through suppliers have enhanced more conformity with technical set specifications.	84	3.75	0.88
Average		**3.83**	**0.91**

Inferential Statistics

Correlation Analysis

The correlation analysis aided in demonstrating the association between the dependent and independent variables. This entailed the r coefficient and whether the association is positive or negative. This is as illustrated in Table 4.

Table 4: Correlation Results

Variable		**Operational performance**	**Supplier collaboration**	**Customer collaboration**
Operational performance	Pearson Correlation	1		
	Sig. (2-tailed)			
Supplier collaboration	Pearson Correlation	0.743	1	
	Sig. (2-tailed)	0.000		
Customer collaboration	Pearson Correlation	0.766	0.451	1
	Sig. (2-tailed)	0.000	0.000	

The correlation results demonstrate a strong, positive and significant association between supplier collaboration and operational performance as reflected by a Pearson correlation coefficient of 0.743 and a P-value of 0.000. This is an indicator that more supplier collaboration translates to improved operational performance.

Further, the correlation results demonstrate a strong, positive and substantial association between customer collaboration and operational performance as reflected by a Pearson correlation coefficient of 0.766 and a P-value of 0.000. This is an indicator that increase in the level of customer collaboration translates to improved operational performance.

Regression Analysis

The regression analysis encompasses the model fitness, the Analysis of Variance (ANOVA) and the regression coefficients. This is as demonstrated below.

Table 5: Model Fitness

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.791	0.625	0.621	0.29172

Supplier collaboration, internal collaboration and customer collaboration were considered satisfactory in explaining operational performance as presented in Table 5. This is as reflected by an R square of 0.625. This thus implies that supplier collaboration, internal collaboration and customer collaboration explain 62.5% of the variations in operational performance with the difference being explained by other factors beyond the study. The other implication is that the model linking the variables relationships is satisfactory. The R value of 0.791 implies that a strong relation exists between the predictor variables (supplier collaboration, internal collaboration and customer collaboration) and operational performance.

Table 6: Analysis of Variance

Indicator	Sum of Squares	Df	Mean Square	F	Sig.
Regression	39.046	3	13.015	152.944	0.000
Residual	23.402	80	0.085		
Total	62.448	83			

Results in Table 6 confirm the significance of the model and this is shown by F statistic of 152.944 and a p value of 0.000. This shows that supplier collaboration, internal collaboration and customer collaboration are good predictors of operational performance. The regression analysis helped to demonstrate the magnitude of influence supplier collaboration, internal collaboration and customer collaboration have on operational performance.

Table 7: Regression Coefficients

Variable	B	Std. Error	Beta	T	Sig.
(Constant)	2.056	0.17		12.11	0.000
Supplier collaboration	0.226	0.057	0.285	3.938	0.000
Customer collaboration	0.168	0.037	0.379	4.559	0.000

Results demonstrated a positively significant relationship between supplier collaboration and operational performance (β 0.226, P 0.000). This illustrate that increase in supplier collaboration by one unit would cause an improvement on operational performance by 0.226 units.

Further, results demonstrated a positively significant relationship between customer collaboration and operational performance (β 0.168, P 0.000). This illustrates that increase in the level of customer collaboration by one unit would cause an improvement on operational performance by 0.168 units.

The resulting regression model is as follows:

Operational performance = **2.056 +0.226**Supplier collaboration **+0.168**Customer collaboration + **Ɛ**

Conclusions

This section presents the conclusions drawn from the research findings for each of the research objectives.

Supplier Collaboration and Operational Performance

The study concluded that supplier collaboration influenced operational performance of 3PL firms positively. This was reflected by the regression and correlation results support the results as there was a positive and significant relationship between supplier collaboration and operational performance. The study further concluded that supplier collaboration in the 3PL service providers in Kenya have been adopted to a great extent where the firms have constant interactions with their suppliers and this has enabled improved procurement management.

Customer Collaboration and Operational Performance

This study concluded that customer collaboration is essential for 3PL firms to use in order to enhance operational performance. Customer collaboration among 3PL firms in Kenya has been adopted to a great extent and this is evidenced by many of the firms having developed channels for customer feedback and also invite customers to participate in the designing of new products. Customer collaboration can lead to economies of scale which would enhance the overall operational performance of a 3PL firm.

Recommendations of the Study

The study revealed that supplier collaboration influenced operational performance positively. The study thus recommends that 3PL service providers should be more vibrant in innovating new ways of integrating with suppliers as this would boost their operational performance and thereby sharpen their competitive edge. To achieve this, the study also recommends the need for policymakers and to come up with policies that make it easy for 3PL service providers to interact with suppliers.

The study revealed that customer collaboration influenced operational performance positively. The study thus recommends that 3PL service providers should invest more resources into customer collaboration which would aid in enhancing operational performance and in essence success of 3PL service providers. Policy makers should come up with policies to ensure their continued effort to integrate with customers is maintained.

Research Areas for Further Studies

The findings of this study revealed that supplier collaboration, internal collaboration, and customer collaboration, accounted for 62.5% of the variation in the 3PL service providers' operational performance. The study suggests that future studies should focus on establishing other factors that account for the remaining 37.5%. Further studies can also focus on a comparative analysis of firms that have adopted supply chain collaboration and those that have not to clearly bring out the difference in terms of their operational performance. Finally, this study was based on a multiple linear regression model, which has its own limitations like errors and misleading results resulting from a change in variable. Future researchers should focus on models like the Vector Error Correction Model (VECM) in exploring the various relations between supply chain collaboration and operational performance.

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