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# SUPPLY CHAIN SCALABILITY AND PERFORMANCE OF DISTRIBUTION FIRMS IN NAIROBI CITY COUNTY, KENYA

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## ABSTRACT

The main objective of the study was on Supply Chain Scalability and Performance of Distribution Firms in Nairobi City County, Kenya. The study was guided by the following specific objectives: to determine the effects of Supply chain agility on Performance of Distribution Firms in Nairobi City County, Kenya, and to determine the influence of Value Chain Mapping on Performance of Distribution Firms in Nairobi City County, Kenya. This study used descriptive research design Descriptive research design is used to describe characteristics of a population or phenomenon being studied. The study population consisted of Clearing and Forwarding Firms, Third Party Logistics Firms. Warehousing and Distribution Firms in Nairobi city county, Kenya. The stratified random sampling technique is appropriate for the study to come up with the sample size, because the target population is heterogeneous or of mixed sectors referred to as stratum. The stratified technique ensured that each sector in the target population has an equal chance of being selected. The most common reliability coefficient is the Cronbach's alpha which estimates internal consistency by determining how all items on a test relate to all other items and to the total test internal coherence of data. Internal reliability test with Cronbach's alpha was used to examine the reliability of each scale Supply chain agility, and Value Chain Mapping. The process of data analysis involved several stages each response was analyzed and their frequency tabulated quantitatively to present a more detailed interpretation. Raw data collected from the field was sorted and summarized in tables and diagrams. With the aid of Statistical Package for Social Sciences SPSS v 26.0. According to the findings; there is a strong significant relationship between supply chain agility, and firm performance ($r=0.637$, $p=0.000$), and a strong significant relationship between value chain mapping and firm performance ($r=0.789$, $p=0.000$). The study recommends that; the distribution firms should be fully responsive to customer orders and communicate seamlessly with customers. Firms should deploy more transport resources to handle any order any time to enhance efficient delivery to customers. The firms should closely work together with suppliers in order to increase the level of integration which in turn increases the operational performance.

**Key Words:** Supply Chain Scalability, Supply chain agility, Value Chain Mapping, Performance of Distribution Firms

## Background of the Study

The study analyzed the influence of Supply Chain Scalability and Performance of Distribution Firms in Kenya. This chapter aims at providing sufficient information for better understanding of the study. Specifically the chapter will provide information on global perspective of Supply Chain Scalability, regional perspective and then narrows down to the local issues that the study will address. It highlights on the background information, statement of the problem, general and specific objectives, and research questions, justification of the study and the scope of the study.

According to Barahona & Elizondo (2017) defines that Scalability is a characteristic of a system, model, or function that describes its capability to cope and perform well under an increased or expanding workload or scope. A system that scales well was able to maintain or even increase its level of distribution performance or efficiency even as it is tested by larger and larger operational demands. This concept is closely related to the term economies of scale, wherein certain companies are able to reduce their production costs and increase profitability as they grow larger and produce more. For situations when increasing production increases costs and lowers profits, it is called diseconomies of scale.

To succeed in an uncertain and competitive environment, firms must respond to changing customer needs faster than before, and logistics flexibility is an important part of this response. Customer loyalty can be changed easily if the firms cannot satisfy any of their needs. Each customer is looking for special treatment in design, production, and delivery, which is the main reason for the firms, must view flexibility from a supply chain perspective instead of equipment or process perspective. (Johnston & Cheng, 2018). Logistics flexibility is the ability of a firm to respond quickly and efficiently to continuously changing customer needs in inbound and outbound delivery, support, and services. It enables firms to satisfy demand. As it occurs rather than forecast sales and react to future orders. Logistics flexibility includes many activities such as organizing inbound and outbound shipments, providing manufacturing support, and supplying information to coordinate these efforts. With logistics flexibility, a firm delay commitment, embrace change, and fine tune delivery to meet specific customer needs. Logistics flexibility is supported by a market oriented strategy where all parties work together to create a fast, efficient, and reliable supply chain (Kari, 2016).

Scalable supply chain is considered, consisting of a network of supply, production, and delivering firms. In this case, many sources of uncertainty have to be handled, such as market demand, supplier lead time, product quality, and information delay. Flexibility allows switching production among different plants and suppliers, so that management can cope with internal and external variability. In manufacturing, logistics is an important source of competitive advantage, since material flows strongly affect business performance (Hitt & Dacin, 2020). Different logistics channels of the supply chain are activated in order to face emergencies such as demand peaks. The production order assignments to the plants and the organization of transports are then critical decisional factors that can decrease the performance of a wide range of products. Flexibility seeks to increase range/variety, improve mobility responsiveness, and achieve uniform performance. Range is the firm's ability to design, make, and distribute different products. Range is high when the number of products is large and the degree of difference among the products is great (Potter& Christopher, 2018).

Scalability in supply chain process management is even greater when a firm can switch quickly among a large number of different products with the ability to maintain performance standards as a firm switch among products. With high uniformity implies the ability to maintain high quality as the product is changed (Sriram & Stump ,2018). The logistics performance of a supply chain is also affected by the supply strategy: for instance, components can be delivered to a production plant from a local and/or from a distant supplier as well as by single double, or multiple sourcing.

The choice of a supply strategy depends, for instance, either on the critical role of the component or on the logistics complexity (for instance, commodity parts and big components are usually provided by local suppliers). Different distribution and procurement policies are considered in scalable supply chain particular, each assembler can purchase the needed (Tynjala, 2021).

**Statement of the Problem**

There has been concern in the Distribution industry in Kenya faced by capacity shortage, Minimal resources to accommodate an increasing amount of volume of customer delivery due to market Uncertainity and unpredictability caused by customer changing demand pertains (Bernard, 2015). Distribution firms have expressed a reluctance to add capacity, put more trucks on the road, and hire back drivers, because of the economic outlook. Another factor at play is the increased price of fuel. While most fuel increases are passed along to consumers in the guise of fuel surcharges, smaller carriers find it increasingly difficult to keep up with the surging cost of operating their vehicles (Manyega, 2015).

With the distribution changing market condition in Kenya the total cost of a vehicle or a fleet is tremendously increasing, the cost of a vehicle-day is above manageable levels. In 2017 operating costs of transport freight forwarding and movement third part logistics carrier increases from 9% to 12.5 % marginally, the cost of maintenance and operation of the warehouse for the distribution firms ranged between 150,000 to 1,100,000.00, with cost of hiring new trucks and space due to changed demand increasing and inefficient operation, administrative costs to 45-60 % respectively. Review of supply chain processes and costs is an area of critical attention. Distribution firms spent more than 140,000,000 on logistics costs each year, a figure that accounted for 0.0.1 percent of GDP during 2017/2018 F/Y. With logistics costs typically accounting for between 5 % and 8 % percent of revenue, transportation managers are regularly pressed to cut costs and find efficiencies Minimal resources to accommodate an increasing amount of volume distribution deliveries (Johnston & Cheng, 2012).

According to Awino, (2011), provided that distribution firms should build a supply chain that allows scalability the right amount of logistics when you need them. The logistics carrier should have the resources to offer flexibility or to work with any business partner to develop a customized approach to handle specific needs. The logistics provider indicates it may have to alter its service preferences to meet customer requirement. Hence the study will fill this gap by establishing Influence of Supply Chain Scalability on Performance of Distribution Firms in Nairobi City County, Kenya

**Specific Objectives**

The study was guided by the following specific objectives:

i. To determine the effects of Supply chain agility on Performance of Distribution Firms in Nairobi City County, Kenya.
ii. To determine the influence of Value Chain Mapping on Performance of Distribution Firms in Nairobi City County, Kenya.

## LITERATURE REVIEW

### Theoretical Framework

### Adaptive Structuration Theory

The adaptive structuration theory (AST) assist the study in determining the influence of Supply chain agility on Performance of Distribution Firms in Kenya. Anthony Giddens first proposed the theory in his constitution of the society in 1984, which was an attempt to reconcile social systems and the micro/macro perspective of organizational structure. Dsanctis and Poole borrowed from

Giddens in order to propose AST and the rise of group decision support systems in 1996. AST provides the model whereby the interaction between advancing information technologies, social structures, and human interaction is described, and which social structures, rules, and resources provided logistics activities include inbound logistics to the sourcing, expediting and receiving of goods, that is coming to the organization AST is a viable approach in studying how The current business environment is characterized by constant change, shorter product lifecycles, and increased demand uncertainty. As these conditions have become the norm, companies and researchers alike have turned to the concept of agility in their quest for a sustainable source of competitive advantage (Fayezi & O'Loughlin, 2016).

AST is relevant in today's Inbound Logistics practice due to the expanding influence that advancing technologies have had with regard to the human interaction aspect of AST and its implication on socio-biologically inspired structuration in security software applications (Ramakrishna, 2011). The theory presents specific advances in inbound logistics are oriented towards utilisation of resources and raw materials, within the manufacturing or assembly plant. As against this, outbound logistics stresses on the outflow of finished goods or product from the firm to the final consumer show that AST is being used as a driving force of effective warehouse management within organizations. The study used the theory to investigate how complexity, which results in the timely delivery of the goods and materials to the final destination, aims at providing right goods, at given time, in desired quantity and condition, at proper place and price (Mwangi, 2016). In conclusion, the appropriation process of AST might be a good model to analyse the utilization and penetration and better visibility through an inbound logistics management program promotes better inventory management on performance of level four and five hospitals for five County governments in Kenya.

**Systems Theory**

The study was based on Systems Theory in determining influence of Value Chain Mapping on performance of distribution firms. Systems Theory is the Trans disciplinary study of the abstract organization of phenomena, independent of their substance, type, or spatial or temporal scale of existence. It investigates both the principles common to all complex entities and the (usually mathematical) models which can be used to describe them. Systems theory was proposed in the 1940's by the biologist Ludwig von Bertalanffy the investigation was in agreement with Value chain analysis is about understanding how activities and actors that are involved in bringing a product from production to consumption are linked. There is a simple element at the heart of value chain analysis (Wong, & Wong, 2011).

A system can be said to consist of four things. The first is objects – the parts, elements, or variables within the system. These may be physical or abstract or both, depending on the nature of the system. Second, a system consists of attributes – the qualities or properties of the system and its objects. Third, a system had internal relationships among its objects. There are likely to be multiple channels through which a product can be traded across a value chain. It is important to recognize that there might be differences in the ability of actors to access resources or trade products, depending on their capacities, gender, relationships, (Shalle & Amuhaya, 2014).

Besides from the characteristics of actors, it is also important to consider that an actor with a strategic position within a value chain is able to exercise some level of control over processes in the value chain. Depending on the relationships that actors have, they have different opportunities to access information or profit from participating in a value chain. In supply chain management context system theory brings together various components of a complex supply chain (that is the human, capital, information, materials and financial resources etc.) to form a subsystem which is then part of a larger system of supply chains or network. (Paulraj and Chen 2017). The theory

argues that for a holistic perspective ST must be employed to understand the internal and external factors that shape an organization's Performance of Distribution Firms.

**Conceptual Framework**

A conceptual framework is a scheme of concepts or variable which the researcher will use in order to achieve set objectives (Oso & Onen, 2008). Basically, it is a diagrammatic presentation of a theory. The effects of the Supply Chain Scalability are influenced by various factors: Supply chain agility, Value Chain Mapping. These factors are the study 's independent variables and their relationship with the study's dependent variable which is Performance of Distribution Firms in Kenya is as illustrated in Figure 2.1.

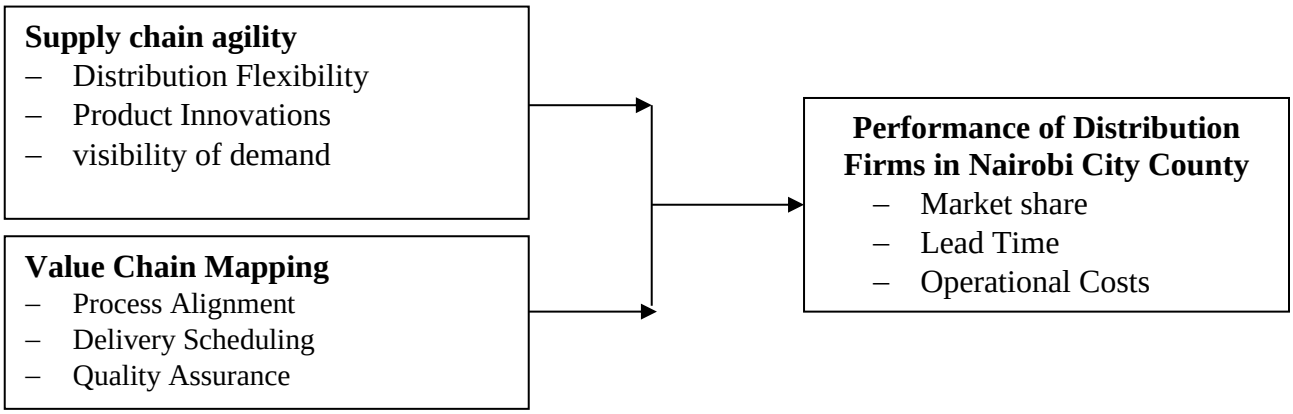


**Figure 2.1: Conceptual framework**

**Supply Chain Agility**

According to defines Awaysheh and Klassen, (2010) that Supply Chain Agility represents how fast a supply chain responds to the changes in environment, customer preferences, and competitive forces. Focuses about random variations in executing day-to-day supply chain operations. It rather specifies how a company's supply chain responds to changes, once business is aware of external changes which negatively/positively affect the business in achieving its objectives. It is a measure of how companies adapt their supply chain to these changes and then how fast it is able to achieve it Supply Chain Agility comes with a cost and sometimes that cost might be huge enough to turn down the profitability.

Distribution Flexibility is the ability of a firm to respond quickly and efficiently to continuously changing customer needs in inbound and outbound delivery, support, and services. It enables firms to satisfy demand. Product innovation is the creation and subsequent introduction of a good or service that is either new, or an improved version of previous goods or services (Barahona & Elizondo, 2014). Agile Response Setting target for lead times and then working towards reducing those lead times specially Order to Fulfillment, lead time greatly help organizations achieve the velocity that is needed to be Agile in today's competitive and changing business environment. Velocity, in how information progresses across the supply chain and how fast the physical product moves down the supply chain, is a critical factor in being a leader among companies. According to states that Bahinipati and Deshmukh, (2012) Companies need to gain visibility into their complex network of customers, suppliers and logistics providers to collectively sense and properly respond to changes in supply and demand. Demand-driven supply chains help to mitigate this effect on inventory by being driven by customer demand. They are built from the outside-in to focus on the customer and to respond directly to external market drivers. This allows companies

to focus more on sensing, shaping and driving an intelligent response to the environment happening outside their internal control.

**Value Chain Mapping**

According to Derek & Eyaa (2012) defines that Value chain mapping is the step in the value chain project design process. A value chain map graphically illustrates all of the components, and relationships between them, of the selected value chain; it is a visual model that helps organisation understands how a particular industry works. Value chain maps demonstrate how a product in an industry moves from raw material through production, processing, and other steps, until it eventually winds up with the consumer. The map highlights the range of activities that occur within the value chain. The map will also outline transformation steps or functions, actors, relationships, and support services.

Organizational alignment is defined as being focused on completing the right work the right way with the right people at the right time. Addressing the problem of the right work is a process of flowing requirements down from the mission/vision set forth by senior management. The requirements are based on the current, transformation, and future states of the organization. The right work is a function of activities to meet current mission and customers' requirements, transform the organization, and deliver on future oriented work associated with the vision. (Fayezi & O'Loughlin, 2016) . All activities that must be carried out before the goods can be delivered to the customer are taken into account during delivery scheduling. This includes loading, picking, and packing. Delivery scheduling determines the material availability deadline and the loading deadline. All deadlines that are used for preparing and carrying out the transportation of goods are taken into account during transportation scheduling (Dehghan & Jalalian, 2019). This includes the transit time and the transportation lead time that you need for ordering a foreign forwarding agent or for arranging a truck from your company's truck fleet. The goods issue deadline and the transportation scheduling deadline are determined by transportation scheduling. Quality control is often used interchangeably to refer to ways of ensuring the quality of a service or product. For instance, the term assurance is often used as follows: Implementation of inspection and structured testing as a measure of quality assurance (Nyaoga & Aduda, 2018).

**Performance of Distribution Firms in Nairobi City County, Kenya**

According to Momiwand & Shahin, (2019) the basic goals of performance management are to improve Performance, reduce costs and minimize risk. A good performance management solution provides a reliable performance metrics. Cost Reduction use one supplier; you are eliminating competition for your orders. Find several suppliers who compete on price, and use several of them at all times so you can avoid costly delays in receiving products. Using multiple suppliers protects you from spending money for less-than-satisfactory service. In addition, if there's no approval process and individuals have the power to order supplies whenever they want, you could be ordering things you don't need. Examine your ordering process to see if it is causing waste (Sriram & Stump 2017). According to Sharabati & Salleh, (2019) states that on Lead Time finding ways to expedite shipments from suppliers, order closer to the time you need the supplies. Ordering far in advance can incur warehouse costs, because you have to store them so that they'll be available, and products are more likely to get lost or damaged. In addition, examine whether shorten the time it takes to transport supplies from where receive them to where needed Transportation from the supplier and within your company add days or weeks to the supply chain and increase costs (Derek & Eyaa,2018).

The potential benefits of SCM include product and delivery process quality such as shorter delivery times, more reliable delivery promises, fewer schedule disruptions, cost savings (for example, significant reductions in inventories) and risk reductions (Frodell,2014)., integration of processes in the supply chain can also enhance the ability to leverage its scalable competences, for

the enforcement of innovative product design and radical process innovation, and to access complementary partner assets(Otieno& Getuno ,2016).

**Empirical Review**

**Supply chain agility**

According to the studies by Fayezi & O'Loughlin (2016) on Understanding and Development of Supply Chain Agility and Flexibility this network includes 352 dealers and their workshops, 1545 authorized service centers covering 898 cities and towns. There are 12 joint ventures (production facilities) in the company network; each of the joint ventures has its own computer systems to cater for production planning, scheduling and material scheduling. The top management in the company network is committed to integration of production facilities in order to take advantage of supply chain efficiencies (Potter& Christopher, 2015). All the dealers in the supply chain are connected via extranet. These dealers provide real-time information about market conditions and demand. Based on the sales forecast and dealer orders, production plans are formulated. These plans percolate in the supply chain through communication to the suppliers to enable them to plan their production in advance. Latest IT tools such as extranet, EDI and e-mails are used to communicate these plans to the suppliers. In the proposed ISM, to identify supply chain agility variables, and to establish mutual relationship, brainstorming sessions were conducted with experts from the trading partners of the supply chain (Kebo & Svub, 2019).

The study concluded that has lean, responsive, and agile supply chains require satisfactory or high levels of perceived trust of companies towards suppliers and customers. Some of the factors critical for successful agile organizations in managing their supply chains are inventory and capacity in developing agile supply chain for an apparel manufacturer. Developed an infra-structural framework for the design and development of an agile supply chain system, which is characterized by its ability to cope with unpredictable changes related to the management of suppliers and flow of parts within the value chain of the entire production network. These are cooperating to enhance competitiveness, enriching customer, mastering change and uncertainty, and leveraging the impact of people and information. Dehghan & Jalalian, (2013) has supported the role of real time and asynchronous collaboration technology for allowing manufacturers to increase their supply chain agility.

**Value Chain Mapping**

According to studies by Cabras, (2016) Mapping the spatial patterns of public procurement. International Journal of Public Sector Management the studies established that Value chain mapping is a process that identifies the main activities associated with a company's service or product line and is often used in corporate strategy in order to identify performance improvement opportunities. The study concluded that the value chain mapping process usually begins by grouping the company's main supplier groups with customer groups that represent the company's key business inputs and outputs. Looking at top suppliers and significant product lines is often a good place to start for companies in manufacturing. Service-based companies might instead explore the entities affected by their services. Other useful tools to have on hand include a list of key stakeholders and a map of your locations. Obtaining a clear picture of the fundamental inputs and outputs of your business provides valuable information for sustainability program development (Derek & Eyaa, 2018).

According to Baldi and Vannoni, (2019) studies on The Impact of Supplier management, Corruption and Institutional Quality on Procurement Prices: An Application to Pharmaceutical Purchasing in Italy. Collegio Carlo Alberto.established that CR professionals are developing sustainability-specific value chain maps in order to systematically assess the company's impacts throughout product sourcing, transport, development, use and disposal. The mapping process once

the value chain is mapped according to significant inputs and outputs and the nodes represent entities with the same general impacts, it then is used to identify the main environmental, social and economic impacts generated as a result of your business. Corporate responsibility (CR) professionals are beginning to use value chain mapping in the development of sustainability strategy and materiality assessments When a value chain is being developed for the purpose of assessing environmental, social and economic impacts (Awaysheh & Klassen, 2010).

## RESEARCH METHODOLOGY

This study used descriptive research design Descriptive research design is used to describe characteristics of a population or phenomenon being studied. The study population consisted Of Clearing And Forwarding Firms,Third Party Logistics Firms ,Warehousing And Distribution Firms Target population is defined by Orodho, (2013) as a universal set of the study of all members of real or hypothetical set of people, events or objects to which an investigator wishes to generalize the result. The target population was obtained from Transport Managers, Distribution officers, Dispatch officers and Logistics Officers The staffs in the logistics and distribution in Clearing And Forwarding Firms,Third Party Logistics Firms ,Warehousing And Distribution Firms in kenya the target population was as follows.

The stratified random sampling technique was appropriate for the study to come up with the sample size, because the target population is heterogeneous or of mixed sectors referred to as stratum. The study adopted Yamane's formula of 105 respondents. The study collected primary data for analysis. Primary data was obtained by the use of structured questionnaires. The data was coded and checked for any errors and omissions. With the aid of Statistical Package for Social Sciences SPSS v 28.0, the research thus performed a multiple regressions analysis on primary data to estimate the beta values of factors and t-test to determine the significance of the coefficients at 95% confidence level. The results of analysed data were presented using tables and charts

## DATA ANALYSIS, PRESENTATION AND INTERPRETATION

The study sampled 105 employees in the distribution firms out of which 10 were used for piloting. Questionnaires were hence administered to 95 staff and 76 were returned answered questionnaires hence 80% response rate. The high response rate was a result of close follow up of the data collection procedure and constant contact with the sampled respondents. In addition, the staff were adequately briefed on the study purpose and given adequate time to answer the questionnaires.

### Supply Chain Agility

The first objective sought to determine the effects of Supply chain agility on Performance of Distribution Firms in Nairobi City County, Kenya. Respondents were asked to indicate their level of agreement with statements that relate to the influence of Supply Chain Agility on performance of distribution firms in Nairobi City County Kenya. Respondents are presented in Table 1.

**Table 1: Supply Chain Agility**

Key; 1- strongly disagree (**SD**), 2-disagree (**D**), 3-Neutral (**N**), 4-agree (**A**), 5-strongly agree (**SA**)

| **Statements** | **SD** | | **D** | | **N** | | **A** | | **SA** | | **M** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | |
| Setting target for lead times and then working towards reducing those lead times specially "Order to Fulfillment" lead time | 0 | 0 | 17 | 22.4 | 4 | 5.3 | 8 | 10.5 | 47 | 61.8 | 4.12 |
| Organizations achieve the velocity that is needed to be Agile in today's competitive and changing business environment. | 7 | 9.2 | 6 | 7.9 | 4 | 5.3 | 10 | 13.2 | 49 | 64.5 | 3.64 |
| Ability of an organization to respond rapidly to changes in demand, both in terms of volume and variety | 12 | 15.8 | 2 | 2.6 | 6 | 7.9 | 22 | 28.9 | 34 | 44.7 | 3.84 |
| Market sensitive — it is closely connected to end-user trends | 40 | 52.6 | 22 | 28.9 | 6 | 7.9 | 8 | 10.5 | 0 | 0 | 1.87 |
| Process integration — it has a high degree of process Interconnectivity between the network members. | 36 | 47.4 | 27 | 35.5 | 2 | 2.6 | 4 | 5.3 | 7 | 9.2 | 2.07 |
| Effectively integrating supply chain and forging close and long term relationship with customers and suppliers. | 0 | 0 | 0 | 0 | 6 | 7.9 | 24 | 31.6 | 46 | 60.5 | 4.47 |
| Innovative products and unstable demand typify agile supply drivers. | 4 | 5.3 | 4 | 5.3 | 4 | 5.3 | 8 | 10.5 | 56 | 73.7 | 4.42 |
| Delivering value to customers, Being ready for change, valuing human knowledge And skills, and forming virtual partnership | 4 | 5.3 | 2 | 2.6 | 2 | 2.6 | 22 | 28.9 | 46 | 60.5 | 4.37 |
| Produce a broad range of low-cost, high quality products with short lead times in varying lot sizes, built to individual customer specification | 0 | 0 | 0 | 0 | 4 | 5.3 | 20 | 26.3 | 52 | 68.4 | 4.37 |

Findings show that majority of the respondents strongly agreed that the firms focus on ddelivering value to customers, being ready for change, valuing human knowledge and skills, and forming virtual partnership(m=4.37), the firms effectively integrate supply chain and forge close and long term relationship with customers and suppliers (m=4.47), innovative products and unstable demand typify agile supply drivers (m=4.42), and the firms produce a broad range of low-cost, high quality products with short lead times in varying lot sizes, built to individual customer specification (m=4.37). Respondents also agreed that the firms set targets for lead times and then work towards reducing those lead times specially "Order to Fulfillment" lead time (m=4.12), the firms organize to respond rapidly to changes in demand, both in terms of volume and variety (m=3.84), and organisations achieve the velocity that is needed to be Agile in today's competitive and changing business environment (m=3.64). The staff however disagreed that there is a high degree of process interconnectivity between the network members (m=2.07), the firms are closely connected to end-user trends (m=1.87). Findings imply that

the distributions are making efforts to be agile by ensuring that the products offered create value to the customers. They also try to create good relationships with the customers to retain or acquire higher market share. They are however poor connectivity within the supply chain members and are not closely connected to the end users and may therefore lack information on their tastes and preferences. Findings are in agreement with Kebo and Svub (2019) that some of the factors critical for successful agile organizations in managing their supply chains are inventory and capacity in developing agile supply chain for an apparel manufacturer.

**Value Chain Mapping**

The second objective sought to determine the influence of value chain mapping on performance of distribution firms in Nairobi City County, Kenya. The staff were asked to indicate their level of agreement with statements that relate to the influence of value chain management on performance of distribution firms in Nairobi City County, Kenya. Results are presented in Table 2

**Table 2: Value Chain Mapping**

Key; 1- strongly disagree (**SD**), 2-disagree (**D**), 3-Neutral (**N**), 4-agree (**A**), 5-strongly agree (**SA**)

| **Statements** | **SD** | | **D** | | **N** | | **A** | | **SA** | | **M** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | |
| Scheduling deadline that lies in the past, the system automatically carries out forward scheduling to determine a delivery deadline that can be confirmed | 4 | 5.3 | 10 | 13.2 | 2 | 2.6 | 8 | 10.5 | 52 | 68.4 | 4.24 |
| Define clearly market channels in a vertical manner culminating at end markets at the top of the map. | 12 | 15.8 | 5 | 6.6 | 4 | 5.3 | 10 | 13.2 | 45 | 59.2 | 3.93 |
| Present value chain governance by different types of connecting arrows showing a variant governance patterns associated with separate market channels. | 13 | 17.1 | 6 | 7.9 | 2 | 2.6 | 10 | 13.2 | 45 | 59.2 | 3.89 |
| Mapping is too simplistic a tool to describe the business enabling environment and its impact on value chains. | 24 | 31.6 | 34 | 44.7 | 2 | 2.6 | 12 | 15.8 | 4 | 5.3 | 2.24 |
| Depict product flow from inputs to final market | 5 | 6.6 | 9 | 11.8 | 2 | 2.6 | 10 | 13.2 | 50 | 65.8 | 4.20 |
| Help identify gaps or bottlenecks in production flow | 3 | 3.9 | 4 | 5.3 | 2 | 2.6 | 8 | 10.5 | 59 | 77.6 | 4.33 |
| Describe the value chain structure and relationships | 10 | 13.2 | 2 | 2.6 | 4 | 5.3 | 12 | 15.8 | 48 | 63.2 | 4.13 |
| Backward scheduling determines a material-availability deadline or transportation- | 4 | 5.3 | 8 | 10.5 | 2 | 2.6 | 8 | 10.5 | 54 | 71.1 | 3.68 |
| The transportation lead time and the transit time for transportation scheduling are determined using the route. | 10 | 13.2 | 4 | 5.3 | 4 | 5.3 | 22 | 28.9 | 36 | 47.4 | 4.08 |

Results show that the staff strongly agreed that value chain mapping help identify gaps or bottlenecks in production flow (m=4.33) and scheduling deadline that lies in the past, the system automatically carries out forward scheduling to determine a delivery deadline that can be confirmed (m=4.24). Respondents also agreed that mapping helps to depict product flow from inputs to final market (m=4.20), the firms describe the value chain structure and relationships (m=4.13), the transportation lead time and the transit time for transportation scheduling are determined using the route (m=4.08), firms define clearly market channels in a vertical manner culminating at end markets at the top of the map (m=3.93), firms present value chain governance by different types of connecting arrows showing a variant governance patterns associated with separate market channels (m=3.89), and backward scheduling determines a material-availability deadline or transportation (m=3.68). The staff disagreed that mapping is too simplistic a tool to describe the business enabling environment and its impact on value chains (m=2.24). Findings imply that the firms practices value chain mapping. The staff agreed that value chain mapping is not a simple tool and may have less impact on the value chains. Findings concurs with Baldi and Vannoni, (2019) that value chain maps helps to systematically assess the company's impacts throughout product sourcing, transport, development, use and disposal.

**Firm Performance**

The researcher further sought to find out how the distribution performs. Results are presented in Table 3.

**Table 3: Firm Performance**

Key; 1- strongly disagree (**SD**), 2-disagree (**D**), 3-Neutral (**N**), 4-agree (**A**), 5-strongly agree (**SA**)

| **Statements** | **SD** | | **D** | | **N** | | **A** | | **SA** | | **M** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | **F** | **%** | |
| The market share has been increasing steadily | 6 | 7.9 | 51 | 67.1 | 4 | 5.3 | 2 | 2.6 | 13 | 17.1 | 2.05 |
| Purchase - order - cycle – times are efficient | 8 | 10.5 | 8 | 10.5 | 6 | 7.9 | 2 | 2.6 | 52 | 68.4 | 3.92 |
| The operation costs have been increasing | 12 | 15.8 | 8 | 10.5 | 14 | 18.4 | 13 | 17.1 | 29 | 38.2 | 3.49 |

Findings show that majority of the staff agreed that the purchase - order - cycle – times are efficient (m=3.92) and the operation costs have been increasing (m=3.49). Respondents disagreed that the market share has been increasing steadily (m=2.05). Findings imply that there is high competition among the firms which makes it hard for firms to retain the position of a market leader. The firms are however making efforts to deliver on time though challenges by increasing operation costs.

**Correlation**

The study employed Pearson correlation to determine the strength of the relationship between the variables. Correlation was considered significant at a p value of <0.005. Correlation results are presented in Table 4

**Table 4: Coefficient of Correlation**

| Variables | | Performance | Supply chain agility | Value chain mapping |
|---|---|---|---|---|
| Performance | Pearson Correlation | 1 | | |
| | Sig. (2-tailed) | | | |
| Supply chain agility | Pearson Correlation | .637* | 1 | |
| | Sig. (2-tailed) | .000 | | |
| Value chain mapping | Pearson Correlation | .789* | .435 | 1 |
| | Sig. (2-tailed) | .000 | .000 | |

*. Correlation is significant at the 0.05 level (2-tailed).

According to the findings; there is a strong significant relationship between supply chain agility, and firm performance (r=0.637, p=0.000), a strong significant relationship between value chain mapping and firm performance (r=0.789, p=0.000). Findings are in agreement with Ocharo and Noor (2020) that performance of distribution firms in Kenya is affected by supply chain agility and supply chain integration.

**Regression Analysis**

The coefficient of determination was conducted to measure the fitness of the regression model predicting future results relating to performance of distribution firms. Table 5 presents the Model Summary.

**Table 5: Model Summary**

| Model | R | $R^2$ | Adjusted $r^2$ | Std. Error of the Estimate |
|---|---|---|---|---|
| **1** | 0.880 | 0.756 | 0.763 | .708 |

*Predicators: (constant*) *supply chain agility, value chain mapping,*

The results show that the value of $R^2$ is 0.756. This shows that supply chain agility, value chain mapping account for 75.6% variations in performance of distribution firms. Therefore, other supply chain scalability practices excluded from this study account for 24.4% variations in performance of distribution firms in Nairobi City County, Kenya.

An analysis of variance was conducted to examine the relationship between supply chain scalability practices and performance of distribution firms in Nairobi City County, Kenya. Results are presented in Table 6

**Table 6: Analysis of Variance**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 150.758 | 4 | 34.580 | 67.015 | .000[b] |
| | Residual | 50.079 | 71 | 0.516 | | |
| | Total | 200.837 | 75 | | | |

*Predicators: (constant) supply chain agility, value chain mapping*
*Dependent variable: Firm Performance*

The model was significant (p-value = 0.000) at the 0.05 level in describing the linear relationship between the study variables, as shown in Table 6. The F-statistic of 67.015 indicates that the model is capable of predicting the relationship between the independent and dependent variables.

The regression analysis also demonstrates how changes in one of the independent variables predict changes in the dependent variable. Table 7 presents the regression coefficients.

**Table 7: Regression Coefficients**

| Model | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant/Y Intercept | 5.613 | .411 | | 12.700 | .000 |
| Supply chain agility | .612 | .080 | .515 | 7.611 | .000 |
| Value chain mapping | .820 | .066 | .733 | 12.817 | .003 |

According to findings in Table 7, the equation

Firm Performance= 5.613 + 0.612 (supply chain agility) + 0.820 (value chain mapping)

The regression equation shows that; holding all factors at constant zero, firm performance would be at 5.613. In addition, a unit change in supply chain agility would predict a unit increase in firm performance by a factor of 0.612, a unit change in value chain mapping would predict a unit increase in employee performance by a factor of 0.820

All variables (supply chain agility, value chain mapping) cause a significant change on firm performance sig<0.5. Findings also show that value chain mapping had the greatest effect of firm performance in the distribution firms (t=12.817), followed by supply chain agility (t=7.611),

## Conclusion

Agile supply chain strategy had a positive and statistically significant effect on performance of distribution firms in Kenya. responsiveness to customer requirements and enquiries and flexibility of procedures and processes are as key contributors to agile supply chain practices. The agile supply chain is virtual in the sense when it is connected and integrated through shared information of real demand. Distribution flexibility enables a firm to respond quickly and efficiently to continuously changing customer needs in inbound and outbound delivery, support, and services. It enables firms to satisfy demand.

It can be concluded that value chain mapping had a statistically significant and positive correlation effect on performance of distribution firms in Nairobi. A well-managed value chain optimizes interactions between firm in order to increase service delivery, resource utilization, and cost savings, particularly in the area of inventory holding. Value chain mapping help a firm to improve the quality of products/ services, evaluate competitive positioning, reduce delivery time both from suppliers and to the customers, and minimize costs through reconfiguring the value chain. Value chain mapping enables firms to understand the various players involved, various activities which add value to the product and also the efficacy of the chain

## Recommendations

The study recommends that the management of distribution firms in Kenya should foster collaboration and communication among supply chain partners. Establish strong relationships with suppliers, distributors, and other stakeholders. Effective communication can help in sharing information promptly, addressing issues, and responding to changes in demand or supply. In addition, the management should develop flexible and adaptive strategies to respond quickly to changes in the market, consumer preferences, or disruptions in the supply chain.

The study recommends that the management of distribution firms in Kenya should conduct a comprehensive value chain mapping exercise that includes all key activities from sourcing raw materials to the delivery of final products to customers and further distributing then to sub stores systems and nearness of products to the customers this is by using appropriate fleet and forwarding systems through logistics. This detailed mapping helps in identifying critical processes, dependencies, and potential areas for improvement. In addition, the management should encourage cross-functional collaboration within the organization to ensure that all departments and teams are

involved in the value chain mapping process. This can lead to a more holistic understanding of the value chain and better alignment of strategies and goals.

**Areas for Further Study**

A similar study should be conducted in other distribution firms in the country since the study only focused on distribution firms in Nairobi City County, Kenya.

A study should be conducted incorporating other variables that probably account for 24.4% variations in performance of distribution firms in Nairobi City County, Kenya

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