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INFORMATION FLOW STRATEGY AND PERFORMANCE OF MANUFACTURING FIRMS IN KENYA

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ABSTRACT

The study sought to determine the influence of information flow strategy on the performance of manufacturing firms in Kenya. Despite the Government initiatives to promote manufacturing firms through "Buy Kenya build Kenya" and mandatory reservation of 40% in all Government agencies Procurement Budgets for goods to be sourced locally; An overwhelming number of manufactures in Kenya have experienced a fall in turnover, with a least 23% registering losses in the range of 65% to 100%, and with 51%, registering loses between 30% and 65%, due to a fall in demand of the products. This study sought to determine the influence of information flow strategy on the performance of manufacturing firms in Kenya. The study was guided by innovation diffusion theory. For this study, the research philosophy was positivism. This study adopted cross-sectional research design. The KAM 2023 directory has listing of members (firms) by sectors which contains a register of 13 sectors of those in manufacturing firms spread all over the country (KAM, 2023). The study targeted all manufacturing companies registered under Kenya Association of Manufacturers. Therefore, the target population was 1032 manufacturing companies in Kenya while the unit of observation was senior managers from production and Supply Chain management. This study adopted Yamane (1967) simplified formula to calculate the sample size. Using this formula, a sample of 288 manufacturing firms were selected. This study utilized a semi-structured questionnaire to collect data. Data analysis was done through use of descriptive and inferential statistics. The study used SPSS version 25 in the analysis of data. The rationale for using correlation and regression analysis is to establish the relationship between information flow and Performance of Manufacturing Firms. The study revealed a significant positive relationship between information flow strategy and the performance of manufacturing firms. Efficient information sharing and coordination in the supply chain positively influenced firm performance. Vendor Managed Inventories and Electronic Data Interchange have enabled information sharing in the firm. Such information shared include information on inventories, customer orders and critical information in both upstream and downstream supply markets. Based on the study findings; Firms should prioritize information flow and coordination within the supply chain. Implementing systems and processes that facilitate timely and accurate data exchange among supply chain partners can lead to improved responsiveness, SC visibility, operational efficiency, and better performance outcomes

Key Words: Information Flow Strategy, Innovation Diffusion Theory Manufacturing Firms

Background of the Study

All organizations depend on their supply chains, and in the fiercely competitive environment of today, effectively developing and managing the supply chain is the same as managing the entire enterprise. The strategy chosen by the organization determine the complete business model followed by the organization. Supply chains strategies are designed on basis of manufacturing of a product, delivered to wholesalers, retailers and made available to the customers (Aguinis, 2015). The most common strategies for moving inventories from upstream to downstream sites are push and pull strategies, or some mix of both (hybrid). Push and pull supply chain strategy is all about determining your manufacturing supply chain and promotional route to and from market, either by the products being pushed towards customers or your customers pulling the product through the retail chain towards them. (Edward A. Silver, David F. Pyke, and Douglas J. Thomas 2016). To grow a manufacturing business an organization needs both strategies, push strategy gets a larger volume of products out to customers faster while pull strategy can take longer and involve many smaller orders (CIPS 2020)

The basically organization's all processes in supply chain management fall into any one of the two categories depending on the timing of their execution with respect to the customer demand. Push and Pull System is a manufacturing system where which production is based on a projected production plan where information flows from management to the market the same direction in which the materials flow (Kalchschmidt & Verganti, 2018). Based on demand estimates, the material is pushed through the supply chain from the originating raw material end to the client end. At the very end of the supply chain, the finished products are ready for orders from clients. At different stages in the supply chain, there is naturally inventory in different forms (raw materials, work-in-progress, and finished goods), 'just-in-case' it may be needed. According to Kaynak and Hartley (2019), push processes function in an atmosphere of uncertainty where client demand is not yet understood.

Pull System is a manufacturing system in which production is based on actual daily demand (sales), and where information flows from market to management in a direction opposite to that in traditional (push) systems worked on the performance of push and pull system. In this strategy, a customer order pulls material into the supply chain (Kim & Kumar 2016). However, the catch here is that the customer should be willing to wait during the time the product is being processed in the supply chain. If the waiting time on part of the end customer is stretched too long, this strategy starts failing. Pull Process operate in an environment in which customer demand is known. A major advantage of this strategy is that in an ideal scenario, there would be zero inventories all across the supply chain (Larry, 2018). Initially most of the organizations were following Push system but in the last two decades pull system is pushing the push system. These systems have led to the development of lean manufacturing and Kanban System. Although not all sectors can go for the pull system and some have to follow push.

Lehtonen, (2015) asserts that push-pull-based supply chain strategy is an amalgamation of push- and pull-based strategies. The downstream operations from the initial raw material supplier end to another player in the chain are pursued on push-based strategy; while the remaining part of the chain is operated on pull based strategy. For instance, the designing, planning, and procurement of components are done through the push-based strategy by utilizing the aggregate demand forecasts for the various models and variants of the product. However, the assembling of the product starts only when the actual customer demand comes in at the retailer's end of the chain. The paint industry can be considered as the best example of push and pull boundary, they have gained

substantially by having a push-pull based system (Lavie, 2016). In last few decades in lieu of completing the whole process of mixing colours at the large plants. They have started providing facility to retailers who can mix the colour as per the demand of the customer. In other word, the colour mixing has shifted from push to pull strategy. This has helped to reduce the retailers in reducing the inventory also coping with ever-changing demand. According to Lee, (2019) the result is win-win situation for both the customer and retailer as the customer is delighted to get all colours available, whereas retailers are saving on the inventory costs and no possibility of shortages which was the major issue few decades back.

Manufacturing activities have always adopted pull or push strategies depending on the context: the first activities undertaken to hunt for food and shelter for nomadic populations and the first forms of production by sedentary individuals were certainly of the pull type, driven by the need for food and shelter (Lavie, 2016). However, with the development of mass production in the second industrial revolution, we can observe the programmed application of a push type strategy: by coordinating suitable resources, executives set up manufacturing processes on a vast scale, able to produce consistent quantities of goods to be placed on markets where demand was a long way from saturating most of its needs.

Statement of the problem

The assessment and projections of economic growth of Kenya is pegged on the increase in the contribution of the manufacturing sector to the economy (GOK, 2022). However, there is still a gap as to how Manufacturing firm's performance can be heightened despite prominence in the government development blueprints such as Vision 2030 (Economic Survey,2022). In reality, the performance and contribution of manufacturing firms to Kenyan's economy has been worrying especially in the wake of realizations that other sectors of the economy such as real estate and telecommunications have surpassed it on the contribution to the GDP (Economic Survey, 2023). According to the data released by the Kenya National Bureau of Statistics in 2023, GDP at market price contributed by manufacturing firms has been: 9.8% in 2019, 9.6% in 2020, 9.5% in 2021, 8.9% in 2022 and employment has moved from 280,700 in 2019, 271,000 in 2020, 270,200 in 2021 and to 251,700 in 2022.

According to KAM, KPMG 2022 Survey, despite the Government initiatives to promote manufacturing firms through "Buy Kenya build Kenya" and mandatory reservation of 40% in all Government agencies Procurement Budgets for goods to be sourced locally; An overwhelming number of manufactures in Kenya have experienced a fall in turnover, with a least 23% registering losses in the range of 65% to 100%, and with 51%, registering loses between 30% and 65%, due to a fall in demand of the products. Challenges facing manufacturing firms in Kenya may be substantially due to lack of innovative strategies that are key drivers of economic performance and growth, this has led to the rise of importation of capital goods to kshs 1,806.3 billion in 2021 from Kshs 1,581.3 billion in 2018. (Economic survey 2020). According to KIPPRA 2023, Kenya's Manufacturing trade performance is held back by the concentration of exports in the EAC and imports from markets outside Africa, this has been orchestrated by luck of resilient from negative economic shocks, between 2019 and 2023, 72 per cent of African countries received less than 1% (one per cent) each of Kenya's total manufacturing exports to the continent which has to a greater extent affected its growth and contribution to employment in Kenya.

According to the Competitive Industrial Performance (CIP) Index data from United Nations Industrial Development Organization (UNIDO, 2022), the manufacturing sector in Kenya is ranked at position 112 out of 150 economies in the global manufacturing. As a share of GDP,

Manufacturing Value Added (MVA) declined to 8.6 percent in 2022 from 10.29 percent in 2019.Aditionally, manufactured exports from Kenya as a share of total exports declined from 48.6 percent to 41.6 percent. According to KNBS (2023), there is an indication of mergers and acquisitions in most manufacturing companies due to the ongoing financial difficulties, which have seen Simba cement, acquire 100% shares of Cemtech that was one of the upcoming cement manufacturing company in Kenya.

Under the Big Four Agenda, the government's goal is to increase the manufacturing sector's contribution to the Gross Domestic Product (GDP) to 15 per cent by 2022 (currently at 9.2 per cent), create jobs annually, increase foreign direct investment and improve ease of doing business (Presidency, 2022). However, stakeholders have raised many concerns on the lack of strategic focus in inventory management, distribution management and including lack of adherence to the currently laid policies (Ayoyi and Odunga, 2015). Despite manufacturing enterprises contributing significantly to Kenya's GDP, their performance has been dismal over the years and below expectation, between 2019 and 2023, manufacturing contribution to national GDP declined by 1.5 percentage points while the contribution to the industrial sector GDP declined by 2.8 percentage while other sectors registered higher growth rates in the same period (World Bank, 2024). Kenya manufacturing sector growth is projected to slow further for the third year in a row from 2.6% in the year 2024 to 1.8% in 2025, almost three-quarters of a percentage point below the average of the 2022 (World Bank 2024) This depicts the downwards trajectory that manufacturing firms in Kenya are undergoing.

Several studies on supply chain and manufacturing firm's performance have been done However; these studies have used different contexts and knowledge approaches. For instance, Kitheka (2017) in a study of pull and pull supply chain strategies and the performance of supermarkets in western Kenya. Bungei (2018) examined a study on the role of supply chain management practices on organizational performance: A case study of Kenya medical research institute. Mwangangi (2016) did a study to examined the influence of logistics management the on the performance of manufacturing firms in Kenya however this study did not involve push and pull strategies. Rotich (2016) studied on the effect of inventory management strategy on financial performance of listed manufacturing firms in Kenya; however, this study did not touch on the knowledge of push and pull strategies. Atela (2023) analyzed a study on the competitive strategies and performance of manufacturing cement companies in Kenya; however, this study specifically was narrowed to the cement manufacturing industry did not either touch on push and pull strategies. Limited studies seem to have been conducted on this problem especially on push and pull supply strategy in manufacturing industry and hence the cause of this study. This study filled the gap by examining the effect of information flow strategy and performance of manufacturing firms in Kenya.

General Objective

i. To determine the influence of information flow strategy on the performance of manufacturing firms in Kenya.

Theoretical Review

Innovation Diffusion Theory

The Diffusion of innovations theory was proposed by Rogers in 1962; referred to in Einstein (2018). According to Rogers, Diffusion of Innovations theory is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. Based on Diffusion of Innovations theory at the firm level (Einstein, 2018), innovativeness is

related to such independent variables as individual (leader) characteristics, internal organizational structural characteristics, and external characteristics of the organization. Individual characteristics describe the leader attitude toward change

This theory provides a framework with which it can make predictions for the time period that is necessary for a technology to be accepted. Constructs are the characteristics of the new technology, the communication networks and the characteristics of the adopters. Innovation diffusion can be seen as a set of four basic elements: the innovation, the time, the communication process and the social system. Here, the concept of a new idea is passed from one member of a social system to another. Clemons, (2017) redefined a number of constructs for use to examine individual technology acceptance such as relative advantage, ease of use, image, compatibility and results demonstrability. The advantage of the improved system is that it has allowed for better communication between the supplier and the buyer since they have to communicate to ensure that less time is taken to realize value on the supply chain management.

Innovations are often adopted by organizations through two types of innovation-decisions: collective innovation decisions and authority innovation decisions. The collective decision occurs when adoption is by consensus. The authority decision occurs by adoption among very few individuals with high positions of power within an organization (Rogers, 2018). Unlike the optional innovation decision process, these decision processes only occur within an organization or hierarchical group. Because there are many studies published on diffusion of innovations, there have been few widely adopted changes to the theory (Robert et al., 2015). Although each study applies the theory in slightly different ways, this lack of cohesion has left the theory stagnant and difficult to apply with consistency to new problems. Diffusion is difficult to quantify because humans and human networks are complex. It is extremely difficult to measure what exactly causes adoption of an innovation. This is important, particularly in the adoption of new technologies in which those encouraging adoption of new technologies need to be aware of the many forces acting on an individual and their decision to adopt. Diffusion theories can never account for all variables, and therefore might miss critical predictors of adoption. This variety of variables has also led to inconsistent results in research.

Rogers (2018) places the contributions and criticisms of diffusion research into four categories: pro-innovation bias, individual-blame bias, recall problem, and issues of equality. The pro-innovation bias, in particular, implies that all innovation is positive and that all innovations should be adopted. Cultural traditions and beliefs can be consumed by another culture's through diffusion, which can impose significant costs on a group of people. The one-way information flow, from sender to receiver, is another weakness of this theory. The message sender has a goal to persuade the receiver, and there is little to no reverse flow. The person implementing the change controls the direction and outcome of the campaign without the contribution of the receiver. In some cases, this is the best approach, but other cases require a more participatory approach (Giesler, 2017). In complex environments where the adopter is receiving information from many sources and is returning feedback to the sender, a one-way model is insufficient and multiple communication flows need to be examined.

ICT support for core competencies and supply chain capabilities has three dimensions: IT support for communication with supply chain partners, IT support for real-time supply chain information exchange, and IT support for inter-firm coordination. IT support for integration competency refers

to the extent of IT use in re-engineering business process, improving process flexibility, and supporting supply chain integration. Prajogo and Olhager (2017) investigated the relationships between information integration (information technology and information sharing), logistics integration, long-term relationships, and effects on performance. Moberg (2015) found that IT commitment plays a critical role in information exchange. Effective IT connections improve supply chain process integration between supply chain partners. The sustainability of an advantage is possible if IT resources facilitate collaborative communication, leading to the development of complementary capabilities and ultimate performance in organizations and therefore this theory supports the information flow strategy variable in this study.

Conceptual Framework

Conceptual frameworks are visual representations of the relationships between the various building blocks of a study and its arguments (Mugenda & Mugenda, 2018). In this study the independent variable is information flow strategy, the moderating variable is customer demand while the dependent variables is performance of manufacturing firms. The model that forms the conceptual framework of the study is presented in Figure 2.1.

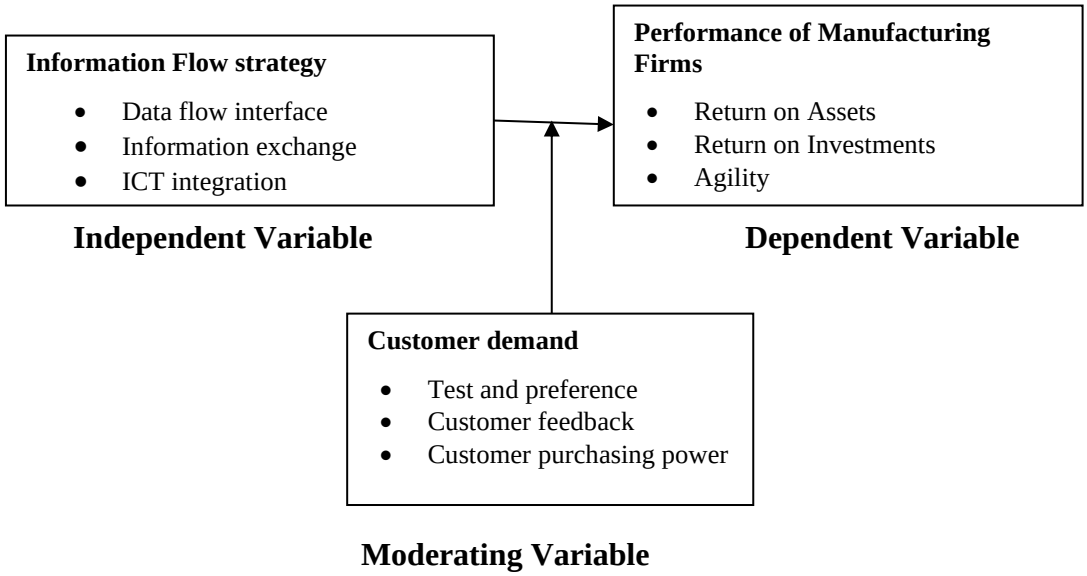

Figure 2. 1: Conceptual Framework

Information flow strategy

Information flow strategy refers to the sharing of key information and market intelligences along the supply chain network that is enabled by information technology (IT) (Gudda, & Bwisa, 2013). One of the main purposes of information integration is to achieve real-time transmission and processing of information required for supply chain decision making. Lee *et al.* (2015) shows that information sharing can lead to lower cost through reductions in inventories and shortages. However, in order to realize this value, changes in the logistics system are required, such as Vendor-Managed Inventory (VMI) programs, lead-time reductions, order quantity reductions and deliveries that are more frequent. In the light of supply chain integration concept, logistics and information integration reflect two interrelated forms of integration that flow in opposite directions (i.e. forward and backward respectively). Forward integration is concerned with the physical flows

of materials and accompanying information from suppliers to manufacturers that we refer to logistics integration. On the other hand, backward integration is concerned with the coordination of information technologies and the flows of information from manufacturers to suppliers (Earl, 2017).

The goal of Vendor Managed Inventory is to promote Customer Relationship Management (CRM) and Supplier Relationship management (SRM) where both the customer and supplier create mutually beneficial relationships that will enable smooth and accurate availability of goods (Gujarati,2017). In VMI a manufacturer or distributor assumes the role of inventory planning for the customer. Instead of the customer reordering when its supply has been exhausted, the supplier is responsible for replenishing and stocking the customer at appropriate levels (Kumar & Reinartz, 2018). In this case, extensive information sharing is required so that the supplier can maintain a high degree of visibility of its goods at the customer's location. The supplier and the customer ought to agree to share enough information vital such as production schedules and/or forecasts to provide some visibility for the supplier. This will enable restocking in a timely manner and maintain a steady flow of goods, then the odds of a synchronized system will dramatically improve (Holweg, 2016).

Information flow in VMI is important to both the customer and the supplier. The supplier will be able to create a good business relationship with the customer (CRM) leading customer retention, driving sales growth and ultimately increased organizational performance (Carter & Price, 2015). As long as the supplier carries out its task of maintaining predetermined inventory and avoiding stockouts, it will be able to lock in a VMI-supported customer for the long term with or without a contract. This will produce a steady and predictable flow of income for the supplier and reduce the risk that the customer will switch suppliers (Switching would be too costly for the customer). A VMI arrangement will allow the supplier to schedule its operations more productively because it is now monitoring its customer's inventory on a regular basis. Furthermore, reductions in inventory will be achieved once the supplier develops a better understanding of how the customer uses its goods over the course of a year (Schreibfeder, 2017).

Customer Demand

According to Levis and Papageorgiou (2014), customer demand is how much a customer is willing to buy a certain product for a certain period of time that forms the agreement of competitive strategy, benefit sharing and risk sharing between buyers and sellers. Various vendors try as much as possible to present the required product quantity and quality so as to achieve the maximum number of customers (Tsai & Chen, 2015). Consequently, the customers invest much of their time and money in making sure that they purchase products of the required quantity and of good quality. Tiemessen, Fleischmann, van Houtum, van Nunen and Pratsini (2013) Customer demand creates a relationship between the customer and the vendor because of trust that has been created between each other. This in turn brings about creation of mutual benefit, achievement of competitive advantage and improved performance (Feng, T., Cai, D., Zhang, Z., & Liu, B. 2016).

Customer demand that is formed between consumers and a manufacturing firm brings about benefit-sharing, risk-sharing as well as long-term, stable and cooperative relationships. Establishing forecasts and management of customer demand can attain the objectives of reducing cost, diversification of risk, gaining critical resources and improving competitive position (Feng.T *et al* 2016)

In line with Yavas and Ashill (2016), some of the main factors used to measure the moderating effect of customer demand include; customer satisfaction, customer loyalty and tastes and preference of customer. Customer satisfaction is the ability of the purchased product to meet the expectations of the consumer, which in turn makes the customer to purchase it again. Customer needs analysis is the process of identifying a customer's requirements for a product or service (Jordan, 2018). It's used in all kinds of product and brand management contexts, including concept development, product development, value analysis, and more. Customer service is important because organizations that provide good customer service gain a competitive advantage over organizations that do not. For example, quality of customer service is related to customer loyalty, customer retention, and increased organizational profits (Reicheld & Sasser, 2019).

Customer service is one of the most critical components of the logistics and supply chain management (Ellram, 2018). It is through customer service that customers get a feel of the product and the business that is selling it. Customer feedback is the information a business collects directly from its customers about their preferences and experiences with a product or service (Douglas, Coleman, & Oddy, 2018). Customers can share their opinions through surveys, interviews, and other channels to tell a company whether they're satisfied or dissatisfied. Customer feedback allows any business to learn directly from its customers; the information can then be used to enhance products, optimize sales funnels, and improve the customer experience (Doyle, 2018).

Empirical Review

Information flow strategy

Information serves as the interface between various supply chain's and functions allowing them to coordinate their actions and bring about many benefits of maximizing total supply chain profitability and mutual understanding Mehrjerdi, Y.Z. (2018) Kamau and Assumpta (2018) carried out a study on the influence of inventory information flow management on organizational competitiveness, with a particular focus on Safaricom Ltd Kenya. The specific objectives of the study was to determine the effects of inventory shrinkage, inventory investment and inventory turnover on the competitiveness of Safaricom Ltd. A descriptive search design was used in this study. The target population comprised of Safaricom Kenya Ltd senior personnel in the following departments; Finance division, customer care, supply, and administration, commercial (sales and marketing) department. The study targeted personnel in those departments as they are better placed to answer questions relating to inventory information flow control and the company's competitiveness. The target respondents included the 103 management staffs from the Company's Head Offices in Nairobi. Stratified random sampling was applied where a sample was calculated using Fishers Formula. The study found that inventory shrinkage, inventory investment, and inventory turnover affects the competitiveness of Safaricom Ltd. The study concluded that inventory management practices are very vital to the competitiveness of organizations.

Frohlich and Westbrook (2016) modelled supply chain integration in terms of both information flow and material using eight items concerning IT, information sharing as well as logistics integration. They found that wider scope of integration had a positive association with performance improvement. However, since the items were combined into a single construct, they were unable to identify any relationship between information integration and logistics integration. Based on a study of five pairs of suppliers and retailers in Taiwan, Sheu *et al* (2016) developed and proposed a relationship model, including long-term relationship, supply chain architecture (including e.g. information sharing and IT capabilities), supplier-retailer collaboration, and performance. They

concluded that better IT capabilities as well as better communication contribute to a better platform for both parties to engage in supply chain coordination, participation and problem-solving activities.

A survey done by SCEA in 2017, revealed an array of factors that were responsible for the efficiency and cost structure of Kenya inventory chain. They included inventory cost and efficiency indicator; time indictors related to deliver goods; truck turnaround time; complexity indictors which measured the level of complexity in undertaking trade transactions and customer perception indicators. Comparing the year 2014/2017with 2012, they came up with the following findings. Increase of 35.2 percent in shipping freight rates was realized in 2012, Aircraft operating costs increased from an average of USD 3.00 per kilogram in 2014/2017 to an average of USD 4.90 per kilogram in 2017; which reduced types of goods transported by air in the year (SCEA, 2018).

The potential of information technology in information exchange in enhancing performance has already been proven in a number of studies (Chen *et al.*, 2015). According to these studies, inventory management practices specifically adoption of information technology such as EDI and VMI enables companies to decentralize operational processes and centralize strategic processes as a result of the transparency provided by the systems. The implementation of IT to enhance the management of inventory is no longer something new. The implementation of IT technologies such as electronic data interchange (EDI) has evolved to the current web technologies such as business to business technologies and collaborative commerce technologies (Berg, 2019).

Customer Demand

Zeithaml (2015) gives an excellent overview of findings of research on aspects of the relationship between customer satisfaction and organizational performance. Positive evidence on the direct relationship between customer satisfaction and organizational performance. in hospital settings with higher profitability; Aaker and Jacobson (2014) found better stock return linked to improved quality perceptions; Anderson, Fornell and Lehmann (2013) found a significant association between customer satisfaction and accounting return on assets that shareholder value is highly elastic with respect to customer satisfaction. Other research is showing that higher customer satisfaction translates into higher than normal market share growth, the ability to charge a higher price, improved customer loyalty with a strong link to improved profitability, and lower transaction costs (Lysons K, Farrington, 2017). Customer satisfaction is also found to be strongly correlated with repurchase intentions, the willingness to recommend the company, and to improved cross-buying (Piasecki 2015)

RESEARCH METHODOLOGY

Research Philosophy

For this study, the research philosophy was positivism. This is because this philosophy premises that knowledge is grounded on facts and that no abstractions or personal position of the individuals is considered. Positivisms thus derive quantitative method, which holds that there is an objective reality that can be expressed numerically, explanatory and predictive power (Neuman, 2018).

With this model, knowledge is valid only if it is grounded on values of reason and facts, collected through direct surveillance and experience measured empirically through quantitative approaches and statistical investigation. Under this paradigm, theoretical models can be established that are generalizable to explain cause and effect association (Saunders, Lewis & Thornbill, 2017).

Research Design

This study adopted cross-sectional research design since it uses theories and hypothesis to account for the forces that causes a certain phenomenon to occur (Cooper & Schindler, 2017). The design is also appropriate for the study as it allows the survey to be carried out in the natural settings and permits the study to employ probability samples. This enhances statistical inferences to be made to the broader populations and permit generalizations of findings to real life situations, thereby increasing the external validity of the study (Frankfort-Nachmias & Nachmias, 2018). The probability sample minimizes bias and enhances reliability of data. Additionally, the design allows the use of questionnaires and inferential statistics in establishing the significant relationships between the variables (Hair *et al.*, 2017).

The study also employed cross-sectional research design as it seeks to describe and establish associations among key study variables, namely, inventory management strategy, information flow strategy, supplier relationship management strategy, distribution management strategy, and customer demand and performance of manufacturing firms. The study used a cross-sectional research design, as data was collected at a given point in time (Creswell, 2014). The design is suitable where the study seeks to describe and portray characteristics of a phenomenon. It also enables the study to profile the sample of a population by collecting accurate information (Burton, 2020).

Target Population

The KAM 2023 directory has listing of members (firms) by sectors which contains a register of 13 sectors of those in manufacturing firms spread all over the country (KAM, 2023). The study targeted all manufacturing companies registered under Kenya Association of Manufacturers. Therefore, the target population was 1032 manufacturing companies in Kenya while the unit of observation was senior managers from production and Supply Chain management.

Sample Size

A sample size is a representation of a larger population. According to (Gujarati, 2017), a sample is deemed suitable if it captures the characteristics of the population sufficiently. According to Mugenda (2003), a sample of 10-50% of the target population is appropriate for social Science studies. This study adopted Yamane (1967) simplified formula to calculate the sample size which provided the number of responses that should to be obtained using the equation;

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = sample size

N = population size

e = the level of precision

This formula assumes a degree of variability of 0.5, the level of precision of 5% and a confidence level of 95%.

$n = 1032 / [1+ 1032(0.05)^2]$

= 288.2681564≈ 288

Using this formula, a sample of 288 manufacturing firms were selected. The selected sample represented 28.8% of the target population. According to Mugenda (2003), a sample of 10-50% of the target population is appropriate for social Science studies. The study then selected senior supply chain managers from each of the 288 selected companies. Therefore, the sample size will be 288 respondents.

Data Collection Instruments

Data collection is the process of collecting and collating information on variables in a systematic way that enables one to answer research questions and evaluate outcomes (Kothari, 2014). This study utilized a semi-structured questionnaire to collect data. Mugenda and Mugenda (2003) state that a questionnaire is a form or document with a set of questions deliberately designed to elicit responses from respondents or research informants for purpose of collecting data or information. The questionnaire contained both closed and open-ended questions. In the closed section the respondents were required to pick one answer. The questionnaire was divided into six sections. The first section focused on personal and professional aspects of the respondents while the other five sections each focuses on a single research objective. Semi structured questionnaires are those in which some control or guidance is given for the answer (Kothari, 2017). These study chose to use Questioners because they are easy to administer and hence saves time as a drop and pick strategy was adopted.

Pilot Study

The term pilot study is used in two different ways in social science research. It can refer to so-called feasibility studies which are small scale versions, or trial runs, done in preparation for the major study Mugenda & Mugenda (2003) However, a pilot study can also be the pre-testing or trying out of a particular research instrument (Gujarati, 2017). A pilot study might give an advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated (Nassiuma, 2019). The questionnaire was pilot tested on 10% of the members of the sample size. These gave to 29 respondents. The responses obtained from this pilot study were used to determine the discrimination, validity, reliability and multicollinearity of the questionnaire after which the relevant amendments were made to the questionnaire. According to Kothari (2017), discrimination of a questionnaire means that people with different scores on a questionnaire, should differ in the construct of interest to the study.

Data Analysis and Presentation

Descriptive data analysis was adopted for this study because descriptive analysis is used to describe the basic features of the data in a study. It provides simple summaries about the sample and the measures (Kothari, 2017). Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data (Bryman & Bell, 2016). The study adopted inferential data analysis in order to enable it reach conclusions that extend beyond the immediate data alone to infer from the sample data about the population.

Inferential statistics facilitate inferences from sample data to population conditions (Mangal & Mangal, 2013). The study used SPSS version 25 in the analysis of data. The study utilized the SPSS to develop a multiple regression model to make inferences on the effect of each of the

independent variables on the dependent variable. The rationale for using correlation and regression analysis is to establish the relationship between inventory management, information flow, supplier relationship management and distribution management against Performance of Manufacturing Firms. Illustrative data representation devices and tools were adopted to diagrammatically represent and analyse the data.

To aid in testing for moderation, the moderating variable was computed by multiplying X by M. A z –score will then be computed for both X and M to specify the precise location of each value within the distribution by indicating whether the score is above the mean (positive) or below the mean (negative). The numerical value of the z-score specifies the distance from the mean by counting the number of standard deviations between X and μ. The resultant scores give a distribution that has a mean score of zero and a standard deviation of one.

FINDINGS AND DISCUSSION

Descriptive Statistics

Information Flow Strategy and Performance of Manufacturing Firms

The mean score for the statement "Our Company uses Vendor Managed Inventory to promote Customer Relationship Management (CRM) and Supplier Relationship Management (SRM)" is 4.42, with a standard deviation of 3.490. This indicates that the respondents agreed with the statements regard to their opinions concerning the above statement. Also, the mean score for the statement "Vendor managed inventory systems play a great role in improving profitability" is 4.33, with a standard deviation of 1.311. This shows that the respondents agreed with the above statement. Furthermore, the mean score for the statement "A VMI arrangement has allowed suppliers to schedule its operations more productively because it monitors its customer's inventory on a regular basis" is 4.99, with a standard deviation of 1.493. This indicates that the respondents agreed with the above statement. More so, the mean score for the statement "Electronic data interchange plays a great role in expanding market share" is 4.54, with a standard deviation of 1.247. This indicates that the respondents agreed with the opinion statement above.

The mean score for the statement "Information sharing can lead to lower cost through reductions in inventories and shortages" is 4.08, with a standard deviation of 0.991. This shows that the respondents agreed with the above opinion statements. More so, the mean score for the statement "We share enough information with our suppliers on production schedules and forecasts to provide some visibility for the supplier" is 4.86, with a standard deviation of 1.483. It demonstrates that the respondents agreed with the above opinion statement. Additionally, the mean score for the statement "Information integration has helped our company achieve real-time transmission and processing of information" is 4.98, with a standard deviation of 1.076. It shows that the respondents agreed with the above opinion statement. The mean score for the statement "Material requirement planning plays a great role in improving profitability" is 4.12, with a standard deviation of 1.395. This shows that respondents were equally in agreement when giving their responses to the above opinion statement. The mean score for the statement "We use ICT to introduce, reinforce, supplement, and extend skills" is 4.95, with a standard deviation of 1.498. It demonstrates that the respondents agreed with the above statement.

From the descriptive findings on the variable regarding Customer Relationship Management (CRM) and Supplier Relationship Management (SRM) the study comes up with the following deductions; Respondents indicate a positive perception of the flow of inventory to meet customer demands. Stock holding costs are generally not perceived to be very high. Regular stock taking

and availability of adequate stock to respond to customer demand are considered important. Stock availability is seen as a secret to effective inventory management. More so, demand forecasting is acknowledged as a valuable tool for estimating materials to meet customer demand. However, the effectiveness of demand forecasting in delivering the right products and quantities without creating a surplus is perceived to be moderate. The theme that emerged is the theme of information sharing. The categories of information sharing relates to the kind of information to be shared, information censoring, and incentive alignment. It emerged that the type of information to be shared among channel participants include product, process and inventory status information, resource information and demand/ order status information. Product information included all information relation to product structure. Process information include the lead time and cycle time information, process costs incurred, quality aspects information regarding to delivery and shipment of consignments as well as setup costs. Information regarding to inventory include inventory status information holding stock. Back order costs and information regarding customer service. Other time of information that needs to be shared included resource information such as various capacities available in any given supply chain to meet production/demand requirements, order status information such as demand data, order batch sixes, etc.

Table 4. 1: Descriptive Statistics for information flow strategy

Aspect	SD	D	N	A	SA	Mean	SD
Objective2Our company uses Vendor Managed Inventory to promote Customer Relationship Management (CRM) and Supplier Relationship management (SRM)	2.4%	0%	0%	53.7%	43.9%	4.42	3.490
Vendor managed inventory systems plays a great role in improving profitability	4.3%	0%	0%	51.4%	44.3%	4.33	1.311
A VMI arrangement has allowed suppliers to schedule its operations more productively because it monitors its customer's inventory on a regular basis.	1.6%	0%	0%	62.4%	36.1%	4.99	1.493
Electronic data interchange plays a great role in expanding market share	5.9%	0%	0%	57.3%	36.9%	4.54	1.247
Information sharing can lead to lower cost through reductions in inventories and shortages	3.9%	0%	0%	58.0%	38.0%	4.08	.991
We share enough information with our suppliers on production schedules and forecasts to provide some visibility for the supplier.	2.4%	0%	0%	60.4%	37.3%	4.86	1.483
Information integration has helped our company achieve real-time transmission and processing of information	3.5%	0%	0%	53.3%	43.1%	4.98	1.076
Material requirement planning play a great role in improving profitability	1.2%	0%	0%	53.3%	45.5%	4.12	1.395
We use of ICT to introduce, reinforce, supplement and extend skills	6.3%	0%	0%	58.8%	34.9%	4.95	1.498

$\bar{x}$= 4.58556

Customer Demand and Performance of Manufacturing Firms

The mean score for the statement "The organization meets the inventory and service demands of the customers" was 4.0625 with a Std. Dev of .99803. The mean score for the statement "The

organization has adopted a demand-driven, consumer -centric approach to planning and forecasting" was 4.0694and a Std. Dev of .95091. The mean score of the statement "The organization focuses less on statistical analysis and more on strategic demand management." Was 4.0208 with a Std. Dev of .91199. The mean score for the statement "Taste and preferences of the customers are key consideration in the organization" was 4.0625 with a Std. Dev of 1.06580. The mean score for the statement "The company Collaborate closely in real-time with customers and trading partners" was 4.0486 with a Std. Dev. of 1.07306. The mean score for the statement "The company enhances customer loyalty by consistently having positive emotional experience, physical attribute-based satisfaction and perceived value of the customer." was 4.0764 and a Std. Dev of .90901. The mean score for the statement "Customers can share their opinions through surveys, interviews, and tell a company whether they're satisfied or dissatisfied." Was 4.056 with a Std. Dev. of 1.0019. The mean score for the statement "The level of customer demand affects the sales volume of the company" was 4.1111 with a Std. Dev. of .82029.

Table 4. 2: Descriptive Statistics for Moderating Effect of Customer Demand

Aspect	SD	D	N	A	SA	Mean	SD
Objective 5 The organization meets the inventory and products that meets demands of the customer's requirements.	5.1%	0%	0%	53.3%	41.6%	4.0625	.99803
The organization has adopted a demand-driven, consumer -centric approach to planning and forecasting	3.5%	0%	0%	60.0%	36.5%	4.0694	.95091
The organization focuses less on statistical analysis and more on strategic demand management.	3.9%	0%	0%	57.6%	38.4%	4.0208	.91199
Customers Taste and preferences are key consideration in our organization's inventories and production schedules.	4.3%	0%	0%	45.5%	50.2%	4.0625	1.06580
The company Collaborate closely in real-time with customers and trading partners	3.1%	0%	0%	47.8%	49%	4.0486	1.07306
The company enhances customer loyalty by consistently having positive emotional experience, physical attribute-based satisfaction and perceived value of the customer.	3.5%	0%	0%	54.1%	42.4%	4.0764	.90901
Customers can share their opinions through surveys, interviews, and tell a company whether they're satisfied or dissatisfied.	3.1%	0%	0%	49.4%	47.5%	4.056	1.0019
The level of customer demand affects the sales volume of the company	2.4%	0%	0%	62.4%	35.3%	4.1111	.82029

$\bar{x}$= 4.0634

Descriptive Statistics for Performance of Manufacturing Firms

The mean for the statement that the organization is making profits over the past three years was 3.5787 with a standard deviation of. 1.39724 The mean for the statement that the organization has recorded a steady increase in profits over the last three years was 4.3583 with a standard deviation of .82068. The mean for the statement that the number of products that we sell has also increased

during the past three years was 4.3071with a standard deviation of .59659 The mean for the statement that the firm is responsive enough to deal with disruptions ex-post a disturbance was 4.3661with a mean of .81718. The mean for the statement that the company is flexible enough to have additional capacities in their contingency plans was 4.2795with a standard deviation of .51520. The mean for the statement that the company exercises product diversification was 4.2874with a standard deviation of 1.00987. The mean for the statement that the company's customer base has been increasing over the last 3 years was is 4.2874 and a standard deviation of .54090. The mean for the statement that the company receives complements from our customers was 3.9488 with a standard deviation of 1.19673. The mean for the statement that most of our sales are orders from our repeat customers is 4.2362 with a standard deviation of .46125

Table 4. 3: Descriptive Statistics for Performance of Manufacturing Firms

Statements	SD	D	N	A	SA	Mean	Std. Deviation
The organization is making profits over the past three years	20.5%	0%	4.3%	51.6%	23,65	3.5787	1.39724
The organization has recorded a steady increase in profits over the last three years	3.1%	0%	3.1%	45.3%	48.4%	4.3583	.82068
The number of products that we sell has also increased during the past three years	0%	0%	7.1%	55.1%	37.8%	4.3071	.59659
The firm is responsive enough to deal with disruptions ex-post a disturbance	3.1%	0%	2.8%	45.3%	48.8%	4.3661	.81718
The company is flexible enough to have additional capacities in their contingency plans	0%	0	3.1%	65.7%	31.1%	4.2795	.51520
The company exercises product diversification	6.3%	0%	2.8%	40.6%	50.4%	4.2874	1.00987
The company's production schedules are always tracked real-time to eliminate wastages	0%	0%	4.3%	62.6%	33.1%	4.2874	.54090
We statistically analyze defects and errors in production process to minimized returns and rejection from our delivered products	7.9%	1.6%	22.0%	24.8%	43.7%	3.9488	1.19673
Our production processes minimize Works in progress items and parts to hasten customer orders.	0%	0%	1.6%	73.2%	25.2%	4.2362	.46125

$\bar{x}$= 4.1832

Inferential Statistics

Correlation analysis

The correlation analysis reveals the following relationships among the variables. For Performance of Manufacturing Firms and Information Flow Strategy there is a strong positive correlation between the performance of manufacturing firms and their information flow strategy ($r = 0.819$, $p < 0.01$). This indicates that firms that effectively manage information flow within their supply chains tend to have better performance outcomes.

For information Flow Strategy, the strong positive correlation between information flow strategy and firm performance indicates that effective management of information within the supply chain is crucial for improving performance outcomes. Timely and accurate information sharing among supply chain partners enables better coordination, responsiveness, and decision-making. Firms that

invest in technologies and systems to enhance information flow and ensure real-time visibility across the supply chain can gain a competitive edge and improve their overall performance.

Table 4. 4: Correlations

		Performance of Manufacturing Firms	Information Flow strategy
Performance of Manufacturing Firms	Pearson Correlation	1	.
	Sig. (2-tailed)		
	N	255	
Information Flow strategy	Pearson Correlation	.819**	1
	Sig. (2-tailed)	.000	
	N	255	255

Information flow strategy and performance

The correlation coefficient R (simple correlation coefficient) measures the strength and direction of the linear relationship between the information flow strategy and the performance of manufacturing firms. In this case, the R value is 0.819, indicating a strong positive relationship between the predictor (information flow strategy) and the dependent variable (performance of manufacturing firms). The coefficient of determination (R-squared) represents the proportion of variance in the dependent variable that can be explained by the information flow strategy. In this case, the R-squared value was 0.670, meaning that approximately 67.0% of the variance in the performance of manufacturing firms can be explained by the information flow strategy. The adjusted R-squared value takes into account the number of predictors and sample size, providing a more conservative estimate of the proportion of variance explained. In this case, the adjusted R-squared value is 0.669.

Std. Error of the Estimate: This value (0.40679) represents the standard deviation of the residuals, providing an indication of the average distance between the observed and predicted values.

Succinctly, the above findings are in agreement with the findings of (Abuya, 2016) who conducted multiple regression analysis on the influence of information flow, supply chain performance, and lead time of road construction projects in Kenya. The study established, through regression analysis that Information flow management strategy had an R2 of 0.483. This means that the performance of road construction projects, measured in respect of lead time is accounted for by 48.3% by information flow strategy. These findings are also consistent with the findings of (Madenas, 2017) who conducted a systematic literature review on the subject. The researcher assessed information flows in supply chain management across product life cycle.

The above results are in tandem with the findings of (Kankam, et al., 2023) who conducted an empirical research on the relationship between information quality and supply chain performance with information sharing as the mediator variable. The study adopted a Structural Equation Modelling. The study findings underscored the combined effect of information quality and information sharing in supply chain performance. Further, these findings are consistent with the findings of (Vanpoucke et al., 2009) who dissected an empirical taxonomy on supply chain information flow strategies and established that there are three key types of integration (alliances) silent alliance, communicative alliance and IT intensive alliance. The study further espoused that

IT intensive integration are better on operational capabilities compared to communicative alliances. The study was cognizant of the role of Electronic Data Interchange on speeding up information flow in supply chain and fostering value added partnerships among the partnering organizations.

Table 4. 5: Information Flow Strategy Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.819[a]	.670	.669	.40679

a. Predictors: (Constant), Information Flow strategy

The ANOVA table examines the overall significance of the regression model. The regression sum of squares (85.005) represents the variability in the dependent variable explained by the information flow strategy. The residual sum of squares (41.867) represents the unexplained variability or error term in the model. The total sum of squares (126.872) is the sum of the regression sum of squares and the residual sum of squares. The F-statistic (513.686) tests the overall significance of the regression model. With a p-value of .000, which is less than the conventional significance level of .05, we can conclude that the regression model is statistically significant. This suggests that the information flow strategy has a significant impact on the performance of manufacturing firms in Kenya.

(Abuya, 2016) conducted multiple regression analysis on the influence of information flow, supply chain performance, and lead time of road construction projects in Kenya. The study established, through regression analysis that the ANOVA table tabulated an F statistic (5, 82)= 15.31 with a p-value = 0.000 indicating that the regression model was statistically significant.

Table 4. 6: Anova table for Information Flow Strategy

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	85.005	1	85.005	513.686	.000[b]
	Residual	41.867	253	.165		
	Total	126.872	254			

a. Dependent Variable: Performance of Manufacturing Firms

b. Predictors: (Constant), Information Flow strategy

In the Coefficients table; the constant term (0.907) represents the expected value of the dependent variable (performance of manufacturing firms) when the information flow strategy is zero. The coefficient for the information flow strategy (0.739) indicates that a one-unit increase in the information flow strategy is associated with a 0.739 increase in the performance of manufacturing firms. The standardized coefficient (beta) of 0.819 suggests a strong positive relationship. Chen and Paulraj (2004) investigated the impact of information sharing and collaboration in supply chains. They found that effective information flow strategies, such as real-time data sharing, improved coordination, and collaboration among supply chain partners, led to reduced lead times, lower costs, and improved overall supply chain performance. Li et al. (2013) examined the relationship between information sharing and firm performance in the context of manufacturing firms in China. Their study revealed that enhanced information flow among supply chain partners

positively influenced supply chain integration, operational efficiency, and customer satisfaction, leading to improved firm performance.

Ghosh and Shah (2012) explored the impact of information technology (IT) adoption and information flow on the performance of manufacturing firms. They found that firms that effectively utilized IT infrastructure to facilitate information flow experienced improved operational efficiency, reduced costs, and increased profitability. Yang et al. (2018) conducted a study on the effects of information flow visibility on supply chain performance in the context of the manufacturing industry. Their findings indicated that higher levels of information flow visibility, including real-time data sharing and visibility across the supply chain, were associated with improved supply chain responsiveness, reduced lead times, and increased customer satisfaction. Kannan et al. (2010) examined the impact of information flow strategies on supply chain performance in the automotive industry. Their research indicated that improved information sharing and visibility among supply chain partners resulted in better inventory management, reduced bullwhip effect, and improved supply chain responsiveness, thereby enhancing overall performance.

Table 4. 7: Coefficients for Information Flow Strategy

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.907	.116		7.788	.000
	Information Flow strategy	.739	.033	.819	22.665	.000

a. Dependent Variable: Performance of Manufacturing Firms

The specific model;

$$Y= \beta 0+ \beta 1\ X4+\varepsilon$$

Performance of Manufacturing Firms = 0.907+0.739 Information Flow Strategy

Moderating Effect of customer Demand

The regression model demonstrates a moderately strong relationship with a correlation coefficient (R) of 0.522. This indicates that the combined effect of the predictors (information flow strategy) moderated by customer demand explains approximately 27.2% of the variance in the performance of manufacturing firms. The adjusted R-squared value of 0.273 suggests that the model provides a good fit to the data, considering the number of predictors and sample size. This adjusted value suggests that approximately 27.3% of the variance in firm performance is explained by the predictors and customer demand moderation.

Table 4. 8: Model Summary with the Moderator Variable

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.522[a]	.272	.273	.40539

a. Predictors: (Constant), x4m, x1m, x2m, x3m

The ANOVA results indicate that the regression model is statistically significant, as the regression sum of squares (85.786) is significantly larger than the residual sum of squares (41.086). This suggests that the combination of information flow strategy and customer demand moderation significantly contributes to explaining the variance in the performance of manufacturing firms.

Table 4. 9: Anova Table with the Moderator

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85.786	2	42.89	263.13	.000[b]
	Residual	41.086	252	.163		
	Total	126.872	254			

a. Dependent Variable: Performance of Manufacturing Firms

b. Predictors: (Constant), x4m, x1m, x2m, x3m

Analyzing the coefficients, it is observed that the predictor moderated by customer demand has statistically significant effects on firm performance. The standardized coefficients (Beta) provide insights into the relative importance of the predictor; Information Flow strategy moderated by customer demand also has a positive standardized coefficient (Beta = 0.859), suggesting that the interaction between information flow strategy and customer demand has a significant positive impact on firm performance.

The positive coefficient indicates that an information flow strategy that considers customer demand patterns positively influences firm performance. This implies that firms that effectively share and communicate information across the supply chain, taking customer demand into account, are likely to achieve better performance outcomes. Timely and accurate information exchange can lead to improved coordination, responsiveness, and customer satisfaction.

Table 4. 10: Coefficients Table with the Moderator

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.108	.069		30.727	.000
	Information Flow strategy moderated by customer demand	1.124	.018	.859	6.784	.000

a. Dependent Variable: Performance of Manufacturing Firms

Hypothesis Testing

The test of hypothesis was conducted using the Ordinary Least Square Regression. The acceptance/rejection criteria was that, reject the null hypothesis if the p-value is less than the convectional 0.05. Fail to reject the null hypothesis if the p-value is higher than the convectional 0.05.

H_{o1}: Information flow strategy has no effect on performance of manufacturing firms in Kenya.

The null hypothesis was that Information flow strategy has no effect on performance of manufacturing firms in Kenya. Results in Table 4.30 indicates that p-value (0.000) was less than

the convectional p-value (p= 0.05). This demonstrates that information flow strategy has a significant effect on performance of manufacturing firms in Kenya. Otherwise put, the role of information flow strategies in determining the performance of manufacturing firms in Kenya cannot be ignored. In conclusion, we reject the null hypothesis H_{o2}: Information flow strategy has no effect on performance of manufacturing firms in Kenya.

Conclusions

The study revealed a significant positive relationship between information flow strategy and the performance of manufacturing firms. Efficient information sharing and coordination in the supply chain positively influenced firm performance. Vendor Managed Inventories and Electronic Data Interchange have enabled information sharing in the firm. Such information shared include information on inventories, customer orders and critical information in both upstream and downstream supply markets.

Recommendations

Based on the study findings; Firms should prioritize information flow and coordination within the supply chain. Implementing systems and processes that facilitate timely and accurate data exchange among supply chain partners can lead to improved responsiveness, SC visibility, operational efficiency, and better performance outcomes.

Firms should strive to establish strategic collaborative partnerships and engage in supplier integration to improve on their information sharing, Building strong relationships with suppliers and implementing effective supplier relationship management practices can contribute sharing critical information regarding the market and this will lead to enhanced product quality, reduced lead times, and improved operational efficiency. Additionally, firms should endeavor to utilize modern versions of ICT software and adopt end to end 3rd party platforms such as Artificial intelligences (AI), blockchain and Machine Learning (ML) with big data analytics capabilities that facilitates predictive analytics, demand planning, risk assessment to enable data-driven decisions, improves forecasting accuracy while integrating customer order processing, while maintaining accurate transactional processes, reflective of the demand and supply.

There should be the adoption of Radio Frequency Identification (RFI) technologies in the warehouses to ensure end to end supply chain visibility across the supply chain echelons both upstream and downstream in the SC. More so, to eliminate the Bullwhip effect, firms should adopt Collaborative Planning forecasting and Replenishment initiative under the auspices of information sharing. Also, the firm should train their employees and stakeholders on the best industry practice knowledge management practices to capture, organize and disseminate valuable demand data insights. They should also leverage on supply analytics to obtain, use and disseminate demand and supply information. Also, the management should support the employees and encourage them to have open communication to enable the freely share their ideas, feedback and concern.

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