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VALUE CHAIN MAPPING ON PERFORMANCE OF FOOD AND BEVERAGE MANUFACTURING FIRMS IN KENYA

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ABSTRACT

Firms with sustainable high performance are those that can develop and deliver more value to their clients while maintaining lower operational costs. While increasing innovation is critical to attaining sustainable and unique firm performance because it increases a firm's ability and capacity to overcome the challenges in the operating environments, businesses also have to increase their understanding of their business system. However, there was little research on the effects of value chain mapping on firm performance and vice versa despite their apparent interconnectedness. As such, this study aimed to delve into this relationship. Thus, the main objective of the study was moderating effect of supplier capability on relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya. This study adopted descriptive survey design to explain and follow positivism approach. The population for the study constituted five hundred and forty-four respondents (544) derived from four departments (procurement department, inventory department, sale management and finance department) from 68 food and beverage manufacturing firms in Kenya. This study collected mainly primary data using a structured questionnaire. Simple random sampling technique was used to obtain 227 respondents from the food and beverage manufacturing firms in Kenya for the study. Cronbach alpha was used to test reliability of research instruments. Explanatory factor analysis was used to test construct validity. Data was analysed using both descriptive and inferential statistics with the aid of SPSS version 25. Hypotheses was tested using multiple regression model and hierarchical regression model at .05 level of significance. The findings showed that value chain mapping 3.737 have a positive moderating effect on the relationship between of value chain mapping on performance of food and beverage manufacturing firms in Kenya. Based on the findings, the study concluded value chain mapping positively and significantly influences performance of food and beverage manufacturing firms in Kenya. The study also concludes that there is significant moderating effect of supplier capability on relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya. From the findings, the study recommends that the management of food and beverage manufacturing firms in Kenya should give priority to value chain mapping.

Key Words: Supplier Capability, Value Chain Mapping, Performance, Food and Beverage Manufacturing Firms

Background of the Study

Firms must respond to changing client needs faster than ever before to compete in an uncertain and competitive environment, and logistical flexibility is a crucial part of that response. Customer loyalty can quickly be shattered if a company fails to meet any of their needs (Purviset al., 2016). Each consumer expects individual treatment in terms of design, production, and delivery, which is why businesses must consider supply chain flexibility rather than equipment or process flexibility (Johnston & Cheng, 2012). 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 (Scholten et al., 2020). In manufacturing, logistics is an important source of competitive advantage, since material flows strongly affect business performance (Hitt & Dacin, 2010). In order to deal with crises like demand peaks, various supply chain logistics routes are engaged. The assignment of production orders to facilities and the arrangement of transportations are then significant decisional elements that can reduce the performance of a variety of items. Flexibility is to broaden the range of possibilities, improve mobility responsiveness, and attain consistency in performance. The firm's range refers to its ability to design, manufacture, and market a variety of items. When the number of products is huge and the degree of difference between them is substantial, the range is high (Potter& Christopher, 2015).

When a company can swiftly switch between a large number of different goods while maintaining performance criteria in supply chain process management becomes even more important. The ability to retain high quality as the product changes is implied by high uniformity (Sriram & Stump ,2012). The supply strategy affects the logistics performance of a supply chain: for example, components can be provided to a production plant from a local and/or distant provider, as well as by single double, or multiple sourcing (Ostensson, 2018). The vital function of the component or the logistics complexity, for example, influence supply plan selection (for instance, commodity parts and big components are usually provided by local suppliers). In a scalable supply chain, different distribution and procurement strategies are taken into account; each assembler can buy what they need (Tynjala, 2012).

Statement of the Problem

The Kenyan food and beverage industry is experiencing an increase in environmental, health and safety expectations as a result of extended responsibility for logistics impacts (KAM, 2017). The rapid, continuous and comprehensive logistics in growth of food and manufacturing in Kenya has also brought great challenges on sustainability of environment; the large use of non-environmentally friendly packing, transportation and warehousing system of product and material in these firms has been a major challenge in environment management (WHO, 2016). A lot of energy is used by food and beverage manufacturing firms. This firms uses so much energy during transportation and storage that produces 8% emissions like carbon dioxide, Sulphur oxides,

nitrogen oxides and particulate matters which becomes an inconvenience to the locals and health menace. (Shraddha & Nehal 2014). Hydrochloric acid vapor, chlorine, metals are the dangerous air emissions (Oss & Padovanii, 2003).

In many emerging economies especially in Africa, food and beverage have seen a reduction in its contribution to GDP from 13.6 percent in the early 90's to 9.2 percent in 2016 (RoK, 2017). According to Kenya National Bureau of Statistics (KNBS, 2019), there had been a decline in growth of food and beverage manufacturing sector from 3.4 percent in 2017 to 3.1 percent in 2018. This then called for new strategies within the food and beverages manufacturing business with the potential of turning around the industry to be in line with the aspiration of Vision 2030; to achieve an average Gross Domestic Product (GDP) growth rate of 10% per annum (RoK, 2007). In Addition, Food and beverages manufacturing firms in Kenya are characterized by elongated or overextended chains retailers (buyers/agents) which, in turn, mean long chains of transactions between chain members and consumers (Amoro, 2011). Odoyo, Wanza and Donatta (2014) noted that the failure rate of manufacturing business has remained high in Kenya for the last decades. This shows that for firms to improve their performance, they ought to consider value chain mapping.

However, their role in developing value chain mapping has never been explored in Kenya. Although, past studies have only discussed implementation of value chain mapping but did not link with firm performance (Panayides & Lun, 2009; Tan et al., 2015), the empirical integration and examination of supply capability and performances of food and beverage manufacturing firms remain unknown in the academic literature. Thus, the study explored the role of supply capability as moderating the supplier capability and firm performance. This study filled this gap by exploring effect of value chain mapping, supplier capability on firm performance in manufacturing firms in Nairobi County, Kenya

Research Objectives

1. To find out the effect of value chain mapping on performance of food and beverage manufacturing firms in Kenya.
2. To determine the moderating effect of supplier capability on the relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya.

Research Hypothesis

The study tested the following hypotheses:

$H_{O1:}$ There is no significant effect of value chain mapping on performance of food and beverage manufacturing firms in Kenya

$H_{O2:}$ There is no significant moderating effect of supplier capability on relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya.

LITERATURE REVIEW

Dynamic Capabilities Theory

Helfat and Peteraf (2015) defined dynamic capabilities as "the ability of a firm to decisively make, extend, or transform its resource base" so as to get to a greater economic value than their rivals. Additional, dynamic capabilities are viewed as a modifier for translating resources into enhanced performance Teece (2007) claims that dynamic capabilities are 'the basis of enterprise-level competitive benefit in regimes of speedy (technological) change'. In additional he claims that dynamic capabilities are constituent abilities that are 'needful to endure greater business

performance' in a greatly dynamic environment. Auger and Teece, (2009) polished this description of dynamic capabilities to "the skill to sense and then snatch new opportunities, and to reconfigure and safeguard information about assets, know-hows, and complementary assets with the goal of attaining a continued competitive benefit". There is no broad agreement on an working description of dynamic capabilities and this makes it problematic to find a generally agreeable scale for assessing dynamic capabilities.

Zollo and Winter (2012) describe dynamic capabilities as educated and steady designs of shared activity via which the firm systemically produces and transforms functioning routines in search of enhanced effectiveness. Teece (2007) later refers to it as the ability to know and then grab new opportunities and to restructure these to attain strategy execution. Augir and Teece (2007) advance this meaning to the inimitable ability organization have to shape, re-shape, organize and reorganize the organization's asset foundation so as to reply to altering markets and technologies. With dynamic capabilities, continued strategy execution comes from the organization's aptitude to leverage and restructure its current know-hows and assets in ways that are treasured to the client but problematic for other rivals to emulate. Dynamic capabilities aid a organization's knows about opportunities and then snatch them by effectively rearranging resources, often by changing current know-hows or making new ones (Teece, 2007).

Dynamic capabilities can helpfully be assumed of as fitting to three groups of actions and alterations: identification and valuation of a chance (sensing); utilization of resources to tackle an opportunity and to seizure value from doing so (seizing); and persistent regeneration of essential know-hows (transforming) (Lee and Wu, 2014).). One main effect of the dynamic capabilities model is that organizations not only compete on their aptitude to utilize their current capabilities and organizational resource, organizations are also competing on their aptitude to discover, renew and advance their institutional capabilities. Therefore, dynamic capabilities permit an organization to sense opportunities and then to grab them by effectively distribution resources, by altering current know-hows or creating new ones. This is specifically true for ITC firms competing in international altering markets.

Dynamic capabilities refer to the organization's technique that consume resources to counterpart and even develop market alterations; therefore, the institutional and strategic practices by which organizations attain new resource arrangement as markets occur, collide, split, evolve, and die (Eisenhardt and Martin, 2013). Dynamic capabilities are treasured in almost all stages of environmental turmoil, indicating that managers must unceasingly try to find new opportunities and make decisions to reorganize their current working capabilities, regardless of the stage of environmental turmoil (Pavlou and Sawy, 2011). Thus, this theory was applied in the research to deliberate supplier aptitude on commercial state corporation performance.

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). The conceptual framework gives an outline of the sorts of the exploration factors which assume a task in the study. Basically, it is a diagrammatic presentation of a theory. The effects of value chain mapping and supply chain automation These factors are the study 's independent variables and their relationship with the study's dependent variable which is performance of food and beverage manufacturing firms in Kenya is as illustrated in Figure 1

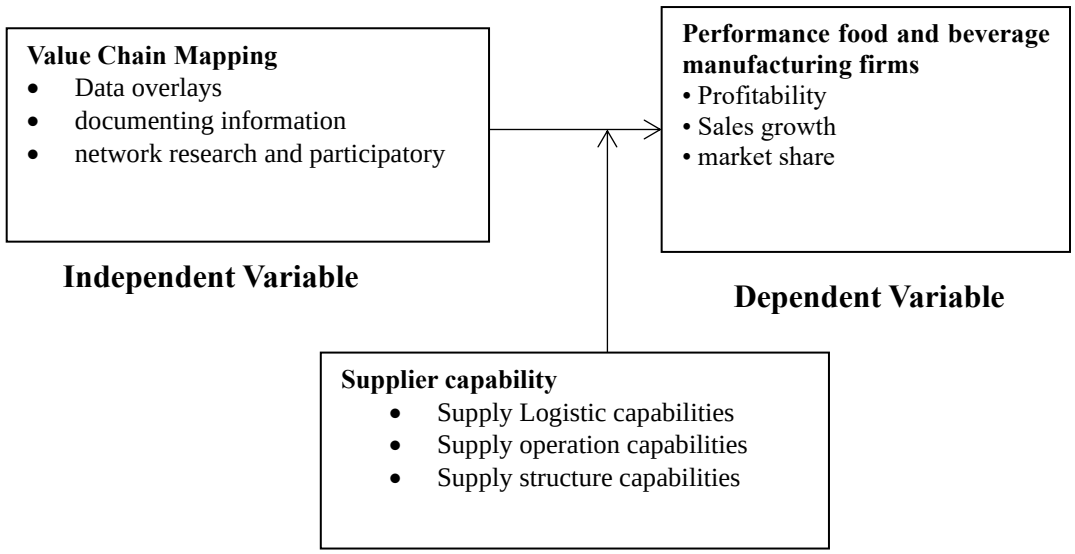

Figure 1: Conceptual Framework

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 organization 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, 2013). 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, 2015)

Supplier Capability

Capability in overall is a new idea, very useful in the literature but with small agreement about what it really means. It is usually acknowledged that every organization has a group of abilities, those let the organization execute a exclusive entity. Working capabilities are organization-specific groups of skills, processes, and procedures, advanced inside the workings management system, that are frequently used in explaining problematic process (Flynn *et al*. 2010). The operations performance is generally connected with competitive standards (quality, cost, flexibility and delivery). Past years, writers as McKone *et al*. (2001), Boyer and Lewis (2002), Ward *et al*. (1998) and Swink *et al*. (2007) have presented researches with small difference about this method.

As per of supply chain actions, ability is connected to the firm's capability in the features of controlling accurate commands timely, creating awareness and offering information with other network members as correct as probable, managing and filling commands through web-centered structure, handling yield product, and identifying international supply penetration (Cho, Ozment and Sink, 2008). Other researches on the topic were held in a wider viewpoint. Swink and Hegarty (1998) recommended seven important abilities in the setting of operations, recognizing groupings as enhancement, invention, integration, correctness, control, agility and responsiveness. Flynn *et al*. (2010), taking the study of Swink and Hegarty (1998) as a foundation, seek to shed light on the restrictions of capability. Based on wide-ranging theoretical review, the writers described six main working capabilities, which worked as the foundation for the preparation of the current research.

Performance of Food and Beverages Manufacturing Firms in Kenya

According to Sharabati & Salleh, (2014) 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,2012).

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 scalability, and to access complementary partner assets(Otieno& Getuno ,2016).

Empirical Review

Value Chain Mapping

According to studies by Cabras, (2011) 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, 2012).

According to Baldi and Vannoni, (2014) 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).

Supplier capability

An organization's supplier capability can be considered as a main strategic resource or ability for procuring maintainable competitive benefit, and may have important effects on organization's and even supply chain 's performance and competitiveness (Rakovska, 2013). Though numerous researchers have revealed that many logistics abilities are confidently related with competitive benefit and/or financial performance, empirical researches have hardly concentrated on China logistics management but mostly have focused on organizations in western advanced countries. There is still inadequate proof to settle that logistics abilities such as process, flexibility and information assimilation capabilities have important effects on organization performance.

Cho et al. (2008) empirically inspected the association between organization 's logistics capability, logistics subcontracting and its performance in some e-commerce market surroundings. The research claimed that e-commerce organizations have a greater probability of producing a maintainable competitive advantage and enhancing performance if they have robust logistics capability. Researches have also expounded the direct input of logistics capabilities to competitive advantage. According to Sandberg and Abrahamsson (2011), the connection between (functional and dynamic) logistics capabilities and maintainable competitive advantage. The research used two Swedish retail organizations for examining the suggested relations. The research used resource centered opinion as the theoretical setting for the aforementioned research. The study claimed that the victory of these two Swedish firms was centered on logistics: functional and dynamic capabilities.

RESEARCH METHODOLOGY

The study adopted positivism philosophy because the study variables were based on facts derived from the empirical literature review and also the theoretical premises highlighted in chapter two. Its results were quantitative and explained the relationship between the variables in a clear quantitative manner. The influence of supply chain automation and performance of food and beverage manufacturing firms were observed. The research design for this study was an explanatory survey research design; this is by and large a positivism approach, under objectivism ontology and epistemology, a methodological philosophy in quantitative research where we apply the methods of natural sciences to discover the study of social science (Hammersley, 2013).

The population for the study constituted five hundred and forty-four respondents (544) derived from four departments (procurement department, inventory department) in 68 food and beverage manufacturing firms in Kenya. These food and beverage manufacturing firms in Kenya were chosen due to their major contribution to the economy in terms of competitive Supply Chain

Practices. They are exposed to how competitive environment is done and thus they were a very resourceful tool in the study. The information they contributed was both relevant and reliable.

The sample size determines the statistical accuracy of the findings. Simple random sampling technique was used to obtain 227 respondents from the food and beverage manufacturing firms in Kenya for the study. Purposive sampling was chosen due to data needs and resources available for the study Singeleton et al., (1998) defines sampling as a process in which relatively small number of elements are selected for the study in order to find out something about the entire population.

This study collected primary data using a structured questionnaire. The purpose of the pilot study was be to establish the accuracy and appropriateness of the research design and instrumentation. Target sample of 10% was taken for the pilot sample as it is considered appropriate Cooper and Schindler (2011). Data analysis was performed with the aid of SPSS version 22.0. Descriptive analysis were done for comparison of means, frequency distribution, standard deviation, skewness and Kurtosis values. Multiple regression analysis was used to predict the value of dependable variable based on the value of two or more independent variables. The study hypotheses were therefore tested using multiple regression analysis where the significant level was set at 0.05. The null hypotheses were therefore rejected if the p-value were less than the selected level of significance (0.05) and alternative accepted.

DATA ANALYSIS

The sample size for the study was 227 respondents from the food and beverage manufacturing firms in Kenya for the study. The selected sample was issued with questionnaires. The returned questionnaires were crosschecked for accuracy and completeness and 196 were found to be valid and reliable and could be used for further analysis and reporting. The returned questionnaires formed a response rate of 86.3%. As explained by Sekaran and Bougie (2016), a response rate of 50% and above is adequate for analysis, 60% and above is good while that of 70% and above is excellent. Therefore, the response rate of 86.3% was excellent for further analysis and reporting.

Descriptive Analysis of Study Variables

Supply Chain Automation

The first objective of the study was to analyze the effect of supply chain automation on performance of food and beverage manufacturing firms in Kenya. Respondents were therefore asked their level of agreement with the statements that relate to the influence of Supply Chain Automation on performance of food and beverage manufacturing firms in Kenya. Table 1 presents summary of the findings obtained.

The respondents' average mean score for this statement (ERP systems incorporate best practices software, reflecting the vendor's interpretation of the most effective way to perform each business process) was 3.87, indicating a generally positive perception of the incorporation of best practices in ERP systems. Additionally, 53.7% of the respondents strongly agreed with this statement, indicating a significant level of acceptance. This finding aligns with the literature by Sohail et al., (2018) which emphasizes that ERP systems provide organizations with pre-configured modules that incorporate industry best practices.

With an average mean score of 3.784, this statement (The system allows shoppers to browse online catalogs, add items to a shopping cart, and submit payments electronically) indicates that automation enables firms to offer an online shopping experience. Moreover, 60.5% of the respondents agreed or strongly agreed with this statement, highlighting the importance of e-commerce and the use of automated systems to provide a seamless online purchasing experience for customers. This finding is consistent with that of Al-Mamary et al., (2018) that recognizes the

growing significance of e-commerce and automation in enhancing customer satisfaction and expanding market reach.

On the statement that the organizations use electronic data interchange (EDI) to manage supply chain management processes; this statement received an average mean score of 3.781, indicating a positive perception of the utilization of electronic data interchange (EDI) among the respondents. Furthermore, 55.6% of the respondents agreed or strongly agreed with this statement, highlighting the importance of EDI in improving supply chain coordination and information sharing. The literature also supports the role of EDI in enhancing supply chain performance and collaboration (Gunasekaran et al., 2017). With a mean score of 3.78, respondents agreed on the statement that automatic order tracking leads to a personalized customer experience with minimal manual intervention; this statement indicates that automation in order tracking positively influences the customer experience. Additionally, 51.3% of the respondents agreed or strongly agreed with this statement, emphasizing the value of automated systems in providing real-time updates and personalized services to customers. This finding aligns with that of Fawcett et al., (2019) which highlights the role of automation in enhancing customer satisfaction through improved order visibility and communication.

The statement automation keeps customers updated on order statuses in real time and enables businesses to better serve customers received an average mean score of 3.756, suggesting a positive perception of automation's ability to provide real-time order updates. Moreover, 54.5% of the respondents agreed or strongly agreed with this statement, indicating the significance of real-time information sharing in serving customers effectively. The study by Büyüközkan et al., (2016) also emphasized the positive impact of real-time communication on customer satisfaction and loyalty. Respondents also agreed with an average mean score of 3.751 that fully-integrated, comprehensive suite of ERP business tools and capacity across all back-office functions; this statement suggests that organizations utilize a fully-integrated suite of ERP tools to streamline back-office functions. Additionally, 51.3% of the respondents agreed or strongly agreed with this statement, highlighting the importance of integrating multiple functions within an organization. The study finding by Reijers et al., (2017) supports the benefits of integrating ERP systems to enhance operational efficiency and resource management.

In addition, the statement that the systems allow sales forecast figures for various products, and the operational plan is derived from the sales plan received an average mean score of 3.749, indicating the significance of using automated systems to derive operational plans from sales forecasts. Moreover, 55.9% of the respondents agreed or strongly agreed with this statement, emphasizing the importance of accurate sales forecasting and its impact on operational efficiency. The study by Mentzer et al., (2021) recognized the value of sales forecasting in optimizing resource allocation and production planning. With a mean score of 3.746, respondents also agreed that an automated online ordering system is a point of communication that businesses can use to provide updates to customers during the entire order management., this statement highlights the role of automated online ordering systems as a means of communication and customer updates. Additionally, 55% of the respondents agreed or strongly agreed with this statement, emphasizing the importance of automated systems in maintaining transparent and efficient order management processes. Cheng et al., (2021) supported the use of automated systems as effective communication channels to enhance customer satisfaction and order visibility.

In addition, ERP systems connect to real-time data and transaction data in a variety of ways. These systems are typically configured by systems integrators. This statement received an average mean score of 3.633, indicating the use of ERP systems to connect to real-time and transactional data. Although the mean score is slightly lower compared to other statements, 48.1% of the respondents agreed with this statement. Jalonen et al., (2017) emphasized the role of ERP systems in integrating

data from various sources to enable real-time decision-making and enhance operational performance.

The findings regarding the effect of supply chain automation on the performance of food and beverage manufacturing firms in Kenya provide support for the positive impact of automation on various aspects of business operations as shown by an aggregate mean of 3.761 (SD= 0.861). The study findings align with those of Baldi and Vannoni, (2014) that supply chain automation is more efficient, accurate, and cost-effective than manual labor. Companies need superior decision-making tools and workflows that can leverage the available data, and, in real time, maximize performance of these sub-processes and the entire supply chain.

Table 1: Descriptive Statistics on Supply Chain Automation

Statement	SD %	D %	N %	A %	SA %	Mean	Std. Dev.
ERP systems incorporate best practices software reflects the vendor's interpretation of the most effective way to perform each business process	3.7	6.2	13	53.7	23.5	3.87	0.889
The system allows shoppers to browse online catalogs, add items to a shopping cart and submit the payments electronically	2.1	4.2	20	60.5	13.2	3.784	0.974
The organisations use electronic data interchange (EDI) to manage supply chain management processes.	0.6	12.4	13.5	55.6	18	3.781	0.884
Automatic order tracking leads to a personalized customer experience with minimal manual intervention.	0.7	9.3	20	51.3	18.7	3.78	0.81
Automation keeps customers updated on order statuses in real time, and enables businesses to better serve customers.	0.6	5.1	26.1	54.5	13.6	3.756	0.87
Fully-integrated, comprehensive suite of EPR business tools and capacity across all back office functions.	4.7	8.3	15	51.3	20.7	3.751	0.822
The systems allow sales forecast figures for the various products and operational plan is derived from sales plan	1	12.8	13.3	55.9	16.9	3.749	0.885
An automated online ordering system produces is a point of communication that businesses can use to provide updates to customers during the entire order management	0.5	6.9	23.8	55	13.8	3.746	0.872
ERP systems connect to real–time data and transaction data in a variety of ways. These systems are typically configured by systems integrators,	1.9	17.7	13.9	48.1	18.4	3.633	0.742
Aggregate Score						**3.761**	**0.861**

Respondents were further asked their opinion on other ways they think supply chain automation influences their firm performance. Supply chain automation is recognized by respondents as a transformative factor in firm performance, as highlighted in their responses to the open-ended question on its influence. One prominent theme emerging from the participants' feedback is the improved efficiency and productivity brought about by automation. By streamlining processes and reducing manual errors, automation has significantly enhanced operational efficiency. As one respondent noted, *"Supply chain automation has significantly increased our operational efficiency by streamlining processes and reducing manual errors."* Another participant highlighted that automation enables them to handle a larger volume of orders without compromising quality, leading to increased productivity.

The respondents also emphasized the accuracy and reliability benefits of supply chain automation. Automated systems have improved inventory management, ensuring optimal stock levels and minimizing stockouts. This heightened accuracy enables firms to meet customer demands effectively. In the words of a respondent, *"Automated systems have improved the accuracy of inventory management, ensuring that we always have the right stock levels and minimizing stockouts."* Furthermore, the ability to analyze data and generate reports in real-time empowers firms to make informed decisions promptly, increasing overall reliability.

Cost reduction and cost savings emerged as another key impact of supply chain automation. Participants reported optimizing their supply chains and reducing costs in areas such as inventory holding, order processing, and transportation. Automation also helps allocate resources more efficiently, resulting in significant cost savings. *"Automation has helped us optimize our supply chain, leading to cost reductions in areas such as inventory holding, order processing, and transportation,"* explained a respondent. By automating repetitive tasks, firms can lower labor costs and allocate resources more effectively.

Respondents recognized the positive impact of supply chain automation on customer service. Through automation, firms can provide faster order fulfillment, accurate delivery tracking, and better respond to customer needs. This leads to improved customer satisfaction and loyalty. *"Supply chain automation has enabled us to provide faster order fulfillment and accurate delivery tracking, enhancing our customer service experience,"* shared one respondent. Another participant highlighted that automation allows for better anticipation of customer needs, personalization of offerings, and timely responses. Risk management also emerged as a significant benefit of supply chain automation. Automated systems provide real-time visibility and monitoring, enabling firms to proactively identify and address potential risks. With improved risk management capabilities, firms can minimize disruptions and maintain business continuity. As one respondent noted, *"Automated systems provide real-time visibility and monitoring of the supply chain, allowing us to identify and address potential risks proactively."*

Lastly, supply chain automation offers firms a competitive advantage. By enabling faster time-to-market, agility in adapting to market changes, and the ability to offer innovative solutions, automation sets firms apart from their competitors. *"Automation has given us a competitive edge by enabling faster time-to-market, agility in adapting to market changes, and the ability to offer innovative solutions,"* emphasized a respondent. The ability to deliver products efficiently, reduce lead times, and stay ahead of competitors contribute to overall market competitiveness.

The findings from the respondents' feedback align with existing literature, by Gunasekaran et al., (2017) which underscores the benefits of supply chain automation in optimizing operations, enhancing decision-making, and driving overall business performance. These include improved efficiency, accuracy, cost reduction, customer service, risk management, and gaining a competitive advantage. Collectively, these responses highlight the transformative role of supply chain automation in shaping firm performance and positioning organizations for success in a dynamic business landscape.

Supplier Capability

The second objective of the study was to determine the moderating effect of supplier capability on the relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya. Respondents were therefore asked to indicate the extent to which the following supply capabilities are used in their manufacturing firms. Table 2 presents summary of the findings obtained. The findings regarding the supplier capabilities in the context of food and beverage manufacturing firms in Kenya reveal the extent to which these capabilities are utilized.

The mean score of 3.721 (SD = 0.835) indicates a large extent level of utilization of supplier capabilities among the respondents.

The presence of direct computer-to-computer links with key supply chain partners is perceived to have a significant impact, with a mean score of 3.849. This suggests that the utilization of digital connectivity with partners is recognized as an important aspect of supply chain management (Gligor et al., 2019). Establishing such links enables real-time information sharing, enhancing collaboration and responsiveness in the supply chain. In addition, the capability of seamlessly connecting the IT system with those of supply chain partners is also considered valuable, as indicated by a mean score of 3.764. This finding aligns with the literature emphasizing the importance of IT system compatibility and integration for effective supply chain coordination and collaboration (Ivanov, 2018).

On the statement, the presence of rules, procedures, and policies provided by the company, as indicated by a mean score of 3.744, suggests a large extent of formalized guidelines for managing supply chain relationships. Such guidelines contribute to standardization, consistency, and efficiency in supply chain operations (Christopher, 2016). In addition, the compatibility of the firm's IT system with those of supply chain partners is perceived as important to a large extent (mean = 3.743). This finding emphasizes the need for technological alignment to facilitate seamless information exchange and integration of systems within the supply chain network (Gunasekaran et al., 2017).

Further, the successful utilization of time-based logistics solutions, such as continuous replenishment, quick response, and Just-in-Time, is acknowledged with a mean score of 3.73. This finding resonates with the literature highlighting the significance of time-based strategies in improving supply chain efficiency and responsiveness (Christopher, 2016). In addition, the perception of having better IT infrastructure than competitors is large extent (mean = 3.669). Having superior IT infrastructure can contribute to gaining a competitive advantage and enabling efficient information flow within the supply chain (Gunasekaran et al., 2017).

The study also found that the integration of operations with customers and/or suppliers through interlocking programs and activities is seen as large extent important (mean = 3.64). This finding aligns with the literature highlighting the value of operational integration in fostering collaboration, coordination, and mutual benefits within the supply chain (Gligor et al., 2019). Also, the existence of active programs to capture the experience and expertise of individuals and transfer knowledge throughout the organization is large extent acknowledged (mean = 3.626). This highlights the importance of knowledge management and learning within the supply chain context (Ivanov, 2018).

A large extent utilization of supplier capabilities indicates that firms in the food and beverage manufacturing industry in Kenya recognize the value of leveraging these capabilities to improve their supply chain operations. The utilization of supplier capabilities enables firms to establish effective collaboration, coordination, and integration with their supply chain partners (Gligor et al., 2019). This facilitates seamless information sharing, efficient logistics management, and improved responsiveness to customer demands. Moreover, supplier capabilities contribute to enhancing supply chain agility, enabling firms to quickly adapt to changing market conditions and customer requirements (Gunasekaran et al., 2017).

Table 2: Descriptive Statistics on Supplier Capability

Statement	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev.
There are direct computer-to-computer links with our key supply chain partners	1.7	8.4	15.6	52	22.3	3.849	0.845
Our IT system can be seamlessly connected with those of supply chain partners	0.6	6.9	23.6	53.4	15.5	3.764	0.845
The company provides a number of rules, procedures and policies	0.6	11.4	14.8	59.7	13.6	3.744	0.949
Our IT system is compatible with those of our supply chain partner	4.3	4.3	20.9	54	16.6	3.743	0.859
The firm successfully utilizes time-based logistics solutions like continuous replenishment, quick response and Just-in-Time with customers and/or suppliers.	4	5.2	19.5	56.3	14.9	3.73	0.895
We have better IT infrastructure than most of our competitors	1.8	14.2	16	51.5	16.6	3.669	0.798
The firm successfully integrates operations with customers and/or suppliers by developing interlocking programmes and activities.	2.6	9	22.2	54	12.2	3.64	0.845
The firm has active programmes to capture the experience and expertise of individuals and transfer this knowledge throughout the organization.	1.7	16.2	20.1	41.9	20.1	3.626	0.644
Aggregate Score						**3.721**	**0.835**

Key: 1-Not at all, 2-small extent, 3-moderate extent, 4-large extent and 5- very large extent

Respondents were also asked to indicate other ways they think supplier capabilities influence their firm performance. Respondents provided valuable insights into the ways in which they believe supplier capabilities influence their firm performance. The impact of supplier capabilities extends beyond mere product delivery, encompassing various aspects of business operations. One recurring theme in the responses is the importance of reliable and efficient supplier relationships. Participants emphasized the significance of suppliers who consistently meet quality standards, adhere to delivery schedules, and provide timely support. As one respondent noted, *"Having suppliers that can deliver high-quality products on time is crucial for our production efficiency and customer satisfaction."*

The role of supplier capabilities in fostering innovation and product development was also highlighted. Participants recognized the value of suppliers who contribute their expertise, collaborate in problem-solving, and offer innovative solutions. This enables firms to introduce new products or improve existing ones, as expressed by one respondent: *"Working with suppliers who bring innovative ideas and technologies helps us stay ahead in the market and meet evolving customer demands."* Supply chain resilience emerged as a key aspect associated with supplier capabilities. Respondents acknowledged the importance of suppliers who have contingency plans in place, robust risk management strategies, and the ability to navigate disruptions. Such capabilities provide a sense of security and minimize the negative impact of unforeseen events on the firm's operations and reputation. As one respondent mentioned, *"Having suppliers with strong resilience and backup plans ensures continuity in our supply chain even during challenging times."*

Cost efficiency and competitiveness were also identified as outcomes of effective supplier capabilities. Respondents highlighted the significance of suppliers who offer competitive pricing, favorable terms, and value-added services. This enables firms to optimize costs, enhance profitability, and maintain a competitive position in the market. One participant stated, *"Partnering*

with suppliers who provide cost-effective solutions gives us a competitive advantage and allows us to offer competitive pricing to our customers." In addition, effective communication and collaboration with suppliers were emphasized as crucial factors. Participants recognized the importance of open lines of communication, mutual trust, and shared goals. Building strong relationships with suppliers fosters collaboration, enables effective problem-solving, and facilitates joint decision-making processes. As one respondent stated, "*Having a collaborative relationship with our suppliers ensures smooth operations, reduces conflicts, and promotes mutual growth*."

Performance of Food and Beverage Manufacturing Firms in Kenya

The primary aim of this study was to investigate the impact of supplier capability as a moderating factor on the relationship between value chain mapping and the performance of food and beverage manufacturing firms in Kenya. Having discussed value chain mapping and the moderating effect of supplier capability in previous sections, this part of the study focuses on assessing the performance of food and beverage manufacturing firms in Kenya from 2018 to 2022. Performance was evaluated based on key indicators including market share, lead time, and operational costs.

Lead Time

The study also measured performance in terms of lead time. The study collected data on the level of performance experienced by food and beverage manufacturing firms in the last five years in terms of lead time from 2018 to 2022. Figure 1 presents a trend in lead time. The findings regarding lead time in the food and beverage manufacturing firms in Kenya show a consistent improvement over the five-year period, with a reduction in lead time from 10 days in 2018 to 7 days in 2021 and 2022. This indicates an improvement in the efficiency and speed of the supply chain operations in terms of order fulfillment and delivery. The consistent reduction in lead time over the years indicates that the food and beverage manufacturing firms in Kenya have made efforts to streamline their supply chain processes and enhance operational efficiency. This improvement in lead time can positively impact customer satisfaction, order fulfillment, and overall business performance.

A shorter lead time is often associated with improved customer satisfaction and increased competitiveness in the market. According to a study by Christopher and Towill (2018), reducing lead time can lead to enhanced customer responsiveness and increased market share. It allows companies to fulfill customer orders more quickly and meet their demands in a timely manner. The decrease in lead time can be attributed to various factors such as improved production processes, better inventory management, and enhanced coordination with suppliers and logistics partners. Implementing supply chain practices that focus on reducing lead time, such as just-in-time (JIT) or lean manufacturing principles, can contribute to the achievement of shorter lead times (Liker, 2018).

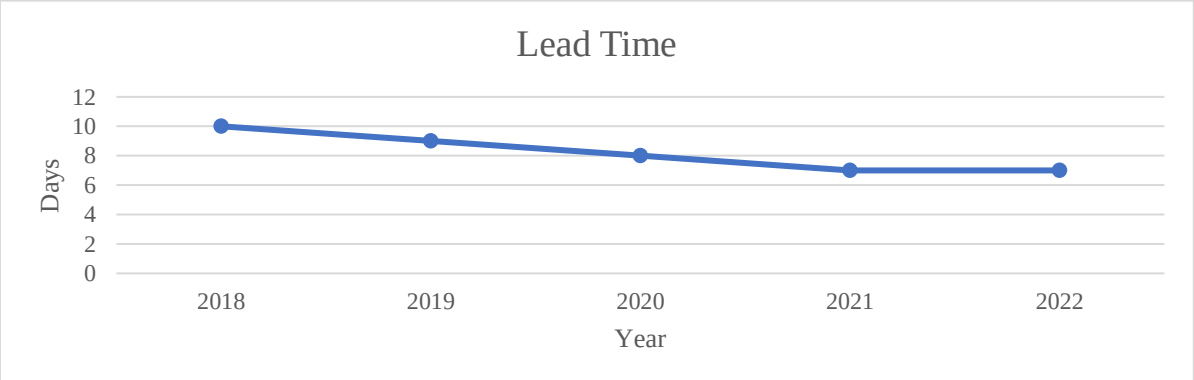

Figure 1: Trend Analysis on Lead Time

Operational Costs

The study also measured performance in terms of operational cost. The study collected data on the level of performance experienced by food and beverage manufacturing firms in the last five years in terms of operational cost from 2018 to 2022. Figure 2 presents a trend in operational cost. The findings regarding operational costs in the food and beverage manufacturing firms in Kenya indicate a gradual reduction in costs over the five-year period. The operational costs decreased from $1,200,000 in 2018 to $1,120,000 in 2022. This reduction suggests an improvement in cost efficiency and the ability of firms to manage and optimize their resources effectively. The findings suggest that the food and beverage manufacturing firms in Kenya have been successful in managing and reducing their operational costs over the years. By implementing cost-saving measures and optimizing their operations, these firms have been able to achieve improved cost efficiency and financial performance.

The decrease in operational costs could be attributed to various factors such as process improvements, cost-saving initiatives, and better resource utilization. Implementing lean manufacturing practices, such as waste reduction and continuous improvement, can help identify and eliminate unnecessary costs in the supply chain (Womack et al., 2019). Managing operational costs is crucial for the financial performance and sustainability of firms. As stated by Mentzer et al. (2017), reducing operational costs can lead to increased profitability and competitiveness. By controlling and minimizing expenses, companies can improve their overall financial performance and allocate resources more strategically.

Figure 2: Trend Analysis in Operational Costs

Test for Hypothesis One

The second objective of the study was to establish the influence of value chain mapping on performance of food and beverage manufacturing firms in Kenya. The corresponding hypothesis was:

Ho_2 Value chain mapping has no significant influence on performance of food and beverage manufacturing firms in Kenya.

A univariate analysis was therefore conducted to test the null hypothesis. From the model summary findings in Table 3, the r-squared for the relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya was 0.215; this is an indication that at 95% confidence interval, 21.5% variation in performance of food and beverage manufacturing firms in Kenya can be attributed to changes in value chain mapping. Therefore, value chain mapping can be used to explain 21.5% change in performance of food and beverage manufacturing firms in Kenya. However, the remaining 78.5% variation in performance of food

and beverage manufacturing firms in Kenya suggests that there are other factors other than value chain mapping that explain performance of food and beverage manufacturing firms in Kenya

Table 3: Model Summary for the Value Chain Mapping

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.464[a]	.215	.213	.70838

a. Predictors: (Constant), Value Chain Mapping

The analysis of variance was used to determine whether the regression model is a good fit for the data. From the analysis of variance (ANOVA) findings in Table 4, the study found out that that Prob>$F_{1,51}$= 0.000 was less than the selected 0.05 level of significance. This suggests that the model as constituted was fit to predict performance of food and beverage manufacturing firms in Kenya. Further, the F-calculated, from the table (305.47) was greater than the F-critical, from f-distribution tables (3.890) supporting the findings that value chain mapping can be used to predict to predict performance of food and beverage manufacturing firms in Kenya.

Table 4: ANOVA for Value Chain Mapping

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.933	1	40.933	305.47	.000[b]
	Residual	25.602	191	0.134		
	Total	66.535	195			

a. Dependent Variable: Organization performance

b. Predictors: (Constant), Value Chain Mapping

From the results in table 4, the following regression model was fitted.

$$Y = 1.808 + 0.469\ X_1$$

(X_1 is Value Chain Mapping)

The coefficient results showed that the constant had a coefficient of 1.808 suggesting that if value chain mapping was held constant at zero, performance of food and beverage manufacturing firms in Kenya would be at 1.808 units. In addition, results showed that value chain mapping coefficient was 0.469 indicating that a unit increase in value chain mapping would result in a 0.469-unit improvement in performance of food and beverage manufacturing firms in Kenya. It was also noted that the P-value for value chain mapping was 0.000 which is less than the set 0.05 significance level indicating that value chain mapping was significant. Based on these results, the study rejected the null hypothesis and accepted the alternative that value chain mapping has positive significant influence on performance of food and beverage manufacturing firms in Kenya.

Table 5: Beta Coefficients for Value Chain Mapping

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.808	.215		8.398	.000
	value chain mapping	.469	.052	.464	9.032	.000

a. Dependent Variable: Organization performance

Test for Hypothesis Two

The second objective of the study was to determine the moderating effect of supplier capability on the relationship between value chain mapping and performance of food and beverage

manufacturing firms in Kenya. Moderation happens when the relationship between the dependent variable and the independent variables is dependent on a third variable (moderating variable). The effect that this variable has is termed as interaction as it affects the direction or strength of the relationship between the dependent and independent variable. To achieve the two research objective, the study computed moderating effect regression analysis. This (moderating effect regression analysis) also guided the study in testing the fifth research hypothesis. Supplier capability (M) was introduced as the moderating variable.

Ho_5: Supplier capability has no significant moderating effect on the relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya.

The model for the moderating effect was: $Y=\beta 0+ \beta 1X1*Z+ \varepsilon$

Where Z is the moderator (Supplier capability)

From the model summary findings in Table 6, the first model for which is the regression between performance of food and beverage manufacturing firms in Kenya (X) without moderator, supplier capability (M) and interaction, the value of R-squared was 0.336 which suggests that 33.6% change in performance of food and beverage manufacturing firms in Kenya can be explained by changes in value chain mapping . The p-value for the first model (0.000) was less than the selected level of significance (0.05) suggesting that the model was significant. The findings in the second model which constituted components of value chain mapping , supplier capability and performance of food and beverage manufacturing firms in Kenya (X*M) as predictors, the r-squared was 0.568. This implies that the introduction of supplier capability in the second model led to a 0.232 increase in r-squared, showing that supplier capability positively moderates performance of food and beverage manufacturing firms in Kenya.

Table 7: Model Summary for Moderation Effect

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.580[a]	.336	.334	.65170	.336	150.295	1	184	.000
2	.754[b]	.568	.564	.52727	.232	79.360	3	183	.000

a. Predictors: (Constant), value chain mapping

b. Predictors: (Constant), value chain mapping , supplier capability, Interaction (X*M)

From the model summary findings in Table 8, the F-calculated for the first model, was 569.93 and for the second model was 506.85. Since the F-calculated for the two models were more than the F-critical, 3.890 (first model) and 2.651 (second model), the two models were good fit for the data and hence they could be used in predicting the moderating effect of supplier capability on performance of food and beverage manufacturing firms in Kenya.

Table 8: ANOVA for Moderation Effect

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63.832	1	63.832	569.93	.000[b]
	Residual	21.675	194	0.112		
	Total	85.507	195			
2	Regression	107.958	3	35.986	506.85	.000[c]
	Residual	13.622	192	0.071		
	Total	121.58	195			

a. Dependent Variable: Organization performance

b. Predictors: (Constant), supplier capability, value chain mapping * supplier capability

Further, by substituting the beta values as well as the constant term from the coefficient's findings for the first step regression modelling, the following regression model will be fitted:

Y = 1.387 + 0.608 X

Where X is value chain mapping

The findings show that when value chain mapping is held to a constant zero, performance of food and beverage manufacturing firms in Kenya will be at a constant value of 1.387. The findings also show that value chain mapping has a statistically significant effect on performance of food and beverage manufacturing firms in Kenya as shown by a regression coefficient of 0.608 (p-value= .000).

By substituting the beta values as well as the constant term from model 2 emanating from the second step in regression modeling the following regression model was fitted:

Y= 3.876 + 0.220 X + 0.325 M + 0.283 X*M

Where X is value chain mapping ; M is supplier capability and X*M is the interaction term between value chain mapping and supplier capability.

The findings show that when value chain mapping , supplier capability, interaction (X*M) are held to a constant zero, performance of food and beverage manufacturing firms in Kenya will be at a constant value of 3.876. The model also indicated that value chain mapping had a positive and statistically significant effect on performance of food and beverage manufacturing firms in Kenya as shown by a regression coefficient of 0.220 (p-value= 0.002). It is also seen that legal structure had a positive and significant effect on performance of food and beverage manufacturing firms in Kenya as shown by a regression coefficient 0.325. On the other hand, interaction of value chain mapping and supplier capability (X*M) also had a positive and significant effect on performance of food and beverage manufacturing firms in Kenya as shown by a regression coefficient of 0.283 (p-value= 0.000).

It is therefore seen that value chain mapping on its own has 22% effect on performance of food and beverage manufacturing firms in Kenya. However, when interacted with supplier capability, it has an effect of 28.3%. This is a clear indication that introduction of supplier capability as moderating variable has positive influence on performance of food and beverage manufacturing firms in Kenya. The study therefore rejects the null hypothesis and accepts the alternative that supplier capability has significant moderating effect on the relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya.

Table 9: Beta Coefficients for Moderation Effect

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.387	.194		7.163	.000
	value chain mapping	.608	.050	.580	12.260	.000
2	(Constant)	3.876	1.009		3.841	.000
	value chain mapping	.220	.067	.782	3.284	.002
	supplier capability	.325	.048	.310	6.748	.000
	Interaction (X*M)	.283	.065	1.661	4.357	.000

a. Dependent Variable: Organization performance

Conclusions

The first null hypothesis test was 'There is no significant effect of value chain mapping on performance of food and beverage manufacturing firms in Kenya''. The study found that value chain mapping has a positive and significant effect on performance of food and beverage manufacturing firms in Kenya. This means that unit increase in value chain mapping would lead to an improvement in performance of food and beverage manufacturing firms in Kenya. Based on the findings, the study concluded that value chain mapping positively and significantly influences performance of food and beverage manufacturing firms in Kenya.

The second research hypothesis tested was that 'There is no significant moderating effect of supplier capability on relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya'. The study revealed that supplier capability is statistically significant in explaining performance of food and beverage manufacturing firms in Kenya. It was also found that the interaction between supplier capability and value chain mapping had positive, statistically significant effect on performance of food and beverage manufacturing firms in Kenya. Based on the findings, the study concludes that supplier capability has significant moderating effect on the relationship between value chain mapping and performance of food and beverage manufacturing firms in Kenya.

Recommendations

The study recommends that the management of food and beverage manufacturing 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. 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.

Strengthen and maintain close relationships with key suppliers. Establish effective Supplier Relationship Management practices that involve open communication, collaboration, and joint problem-solving. A strong partnership with suppliers can lead to better reliability, quality, and innovation. Regularly assess the capabilities of existing and potential suppliers. This assessment should include an evaluation of their production capacity, quality control measures, technological capabilities, and ability to adapt to changing market demands.

Recommendations for further Studies

This study was limited to value chain mapping and performance of food and beverage manufacturing firms in Kenya. The study thus recommends a similar study to be conducted in other firms in the sectors of the economy such as dairy market, apiculture, sericulture, seeds, fisheries, etc. Also, supplier capability was used as the moderating variable; the study thus recommends the use of a different moderator such as technology since value chain mapping is highly influenced by their level of technology use. Also, the study was limited to four independent variables which explained 73.9% of all variation in performance of food and beverage manufacturing firms in Kenya. There is therefore need for a study to be conducted on other factors that can explain the remaining 26.1% variation in performance of food and beverage manufacturing firms in Kenya.

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