

**THE IMPACT OF SUPPLY INTEGRATION ON THE SUPPLY CHAIN
PERFORMANCE IN THE MANUFACTURING FIRMS IN KENYA**

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DECLARATION

This research project is my original work and has not been presented for examination in any other university.

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This research project has been submitted for examination with my approval as university supervisor.

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DEDICATION

This study is dedicated to my lovely wife Dommitilah Nduku, our children Tracy, Emmanuel and Andrew.

Thank You for being there when I needed you most.

ABSTRACT

Nowadays business environment is characterized by faster technological development, shorter product life cycle and more intense global competition. This new competitive landscape force organizations to actively acquire new ways to achieve competitive advantage since a firm's competitive advantage is now more dependent on operating efficiency and productivity across functional areas of the organization. The most successful manufacturers seem to be those that have carefully linked their internal processes to external suppliers and customers in unique supply chains. Manufacturing accounts for 13% of gross domestic product (GDP) of Kenya's industrial sector. The aim of this study was to investigate impact of supply integration on the supply chain performance in the manufacturing firms in Kenya. The target population of this study was 549 manufacturing firms registered with Kenya Association of Manufacturers (KAM) and operating in Nairobi. This study employed descriptive research design. The study relied mostly on primary data sources. The study generated both qualitative and quantitative data where quantitative data was coded and entered into Statistical Packages for Social Scientists (SPSS Version 17.0) and analyzed using descriptive statistics. Forty nine (49) out of the 60 respondents targeted completed the questionnaires making a response rate of 82%. The study concluded that organizations encourage information sharing such as marketing information, production information and technological information. Reducing total cycle time, acquisition of new ideas for products and reducing total logistics costs influence supply chain performance. Purchasing department plays a key role in fostering relationships and communication to improve quality performance for both the supplying and the buying firm. The study found that the organizations have realized significant supply chain coordination through supply chain integration. Through supply chain integration organizations have been able to attain of strategic goals, reduce risks and improve internal and external coordination of operation process.

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LIST OF ACRONYMS AND ABBREVIATION

GDP	Gross Domestic Product
IT	Information Technology
KAM	Kenya Association of Manufacturers
KIRDI	Kenya Industrial Research and Development Institute
KNBS	Kenya National Bureau of Standards
KPIs	key performance indicators
SCI	Supply Chain Integration
SCM	Supply Chain Management
SMEs	Small and Medium Enterprises

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Today's business environment is characterized by faster technological development, shorter product life cycle and more intense global competition. This new competitive landscape force organizations to actively acquire new ways to achieve competitive advantage since a firm's competitive advantage is now more dependent on operating efficiency and productivity across functional areas of the organization (Lowson, 2006). Global competitors operating in the global market almost always tend to have world class performance. Having the right product available in the right place, at the right time, enable the company to compete in this volatile market place. However the resources competencies required are often difficult to mobilize and retain by single company. Therefore, it is imperative for companies to cooperative and leverage complementary core resource competencies through partnership-based coordination (Resse, 2005).

Competition in the manufacturing environment has shifted from individual firms to their respective supply chains, therefore only a firm with agile and versatile supply chain can sustain the effective competitive edge (Saad, Jones & James, 2003). With product demands being more customer-driven, shrinking product lifecycles and alternative products springing up by the hour, there is thus a need for an effective management of the supply chain rather than just the internal factors (Hurst & Jennifer, 2002). For an effective and credible management of the customer and consumer, a joint effort of the suppliers, manufacturers and distributors is required.

As supply chain focuses on the processes management within and beyond organizational boundaries, a measure of its performance is necessary for its effective operation and control. The ultimate success of firms will depend on management's ability to integrate the company's intricate network of business relationships, allowing improved decision making and consequently, reducing cost and customer response time. SCM is not only this but much more and beyond. SCM concerns neither to minimize nor to maximize but rather to optimize (integration, coordination, variability, uncertainty management and control) processes for the enterprise. An efficient and responsive SCM aims to move from a simple SC to a well structured and extended (integrated supply chain).

1.1.1 Supply Chain Integration

A growing body of literature on operations management has suggested that a company will perform well if it has a high degree of supply chain integration (SCI); SCI is defined as organizational processes to integrate suppliers, customers and internal functional units in order to optimize the total performance of all partners in the supply chain (Frohlich and Westbrook, 2001). The integration among organizations within a supply chain occurs in various degrees and does not necessarily correspond to ownership of the whole chain. One of the early contributions acknowledging the phenomenon is Harrigan's (2004) study, in which she argues, "the old concept of vertical integration as being 100 percent owned operations that are physically interconnected to supply 100 percent of a firm's need is outmoded". These days, many organizations decide on a lower level of integration, or as referred by Harrigan (2004) as tapered integration. With this strategy, an organization does not

own 100 percent of the adjacent business units in the supply chain, but relies on other organizations to provide some portion of its input and output.

Swink (2007) argue that the integration process includes activities that require, share, as well as consolidate, strategic knowledge and information with parties outside the immediate organization. Rosenzweig, Roth and Dean (2003) further define supply chain integration as the linkages among various supply chain elements. Supply chain integration includes the internal linkages among the departments, functions, or business units within the firm that source, make and deliver products and the external linkages with entities outside the enterprise, including the network of direct suppliers and their suppliers and direct customers and their customers (Jespersen & Larsen, 2005). Supply chain integration is established when the self-seeking dominant partner is convinced of the need for integration and takes the initiatives to mobilize all partners.

In order to gain a better perspective of supply chain integration, Fawcett and Magnan (2002) identify four types of integration; internal cross-functional process integration; backward integration with key first-tier suppliers, or a natural extension of this integration would involve second-tier suppliers; forward integration with key first-tier customers, or with the customers' customers and complete forward and backward integration, or expressed as integration from "suppliers' supplier to the customers' customer". Three dimensions constitute supply chain integration and determine the level of supply chain integration (Lee, 2000). These dimensions are information sharing, coordination and resource sharing, and organizational relationship linkage. Based on Lee's study, Simatupang et al. (2002) extend this framework by offering different modes of coordination required to integrate the supply chain processes of

different partners. The coordination modes are logistics synchronization, information sharing, incentive alignment, and collective learning. Higher level of collaboration with respect to these four coordination modes indicates a higher degree of supply chain integration.

Backward integration by a manufacturing firm would trigger processes that ensure that the suppliers of the various raw materials implement strategies that positively impact the performance of the manufacturing. The right quality will be delivered in the right quantities at the right time to minimize wastage, inventory costs and obsolescence.

Forward integration within the manufacturing sector seeks to gain proactive feedback of anticipated order quantities, customer preferences and emerging new demands in order to trigger reactive strategies. Joint Business Planning is a recent strategy that is widely employed to bring to the same discussion boardroom, Lead Teams from different firms in the supply chain to discuss budgets, future product plans, anticipated challenges and growth strategies alignment.

1.1.2 Supply Chain Performance

Supply chain performance in the manufacturing sector is measured broadly by the extent to which the organization fulfills the customers and consumer demands. The main key performance indicators (KPIs) used include but not limited to; Production output per shift, cost per unit of output, percentage resource utilization measured in hours, percentage order units fulfilled, percentage orders fulfilled on time, inventory holding in days cover and value, obsolescence stock rate, etc. All the above KPIs

require a well balanced supply chain strategy in order to optimize the overall organizations performance.

Recent years have seen growth in the importance of integration of suppliers, manufacturers and customers (Leenders & Johnson, 2008). Effective integration of suppliers into supply chains serves as a key factor for some companies to gain competitive advantage (Bowersox & Closs, 2006). Time-based management and the relationship between speed of operations and efficiency has been one of the key issues in supply chain management. Stalk (2002) describes companies as systems and says that competitive advantage can be achieved by breaking the debilitating loop strangling traditional manufacturing planning. This means that traditional manufacturing requires long lead-times to resolve conflicts between various jobs or activities that require the same resources. The lead-times require sales forecasts to guide planning. Suppliers should be chosen for their speed and flexibility, not for their low cost (Fisher, 2007). The first step in designing a responsive supply chain performance is to accept that uncertainty is inherent in innovative products. Uncertainty can be avoided by cutting lead-times and increasing the supply chain's flexibility so that it can produce to order or at least assemble the product at a time closer to when demand materializes and can be accurately forecast. Supply chain flexibility can be greatly enhanced by aligning functional processes of as many business partners as possible.

Holmstrom (2009) has empirically studied the efficiency potential of speed in operations. His main results are empirical indications of a strong positive correlation between speed and efficiency in manufacturing and that a focus on speed of operations helps expose and remove self-induced sources of uncertainty. He claims

that the main contributor to uncertainty in slow operations is distorted communication in the activity system. Based on his findings of a “speed threshold” he suggests that inventory commitment needs to be reduced to a point where demand distortion is diminished and a synchronization of production with demand is possible in order to improve performance by speeding up operations. The importance of time as a competitive weapon and the ability to meet customer and market demand with shorter delivery times is important and has been recognized in this circumstance. Several companies are stressing flexibility and agility in order to respond to the unique needs of customer and markets. Getting the right product, at the right price and at the right time to the consumer is not only crucial to competitive success but also the key to survival.

The concept of supply chain partnership extends the perspective of operations from a single business unit to the whole supply chain where relationships are formed between two independent members in supply channels through increased levels of information sharing to achieve goals and benefits in terms of reductions in total costs and inventories. Recent SCM and relationship marketing research has attempted to increase understanding of the conditions for win-win partnerships, customer-supplier relationships in which close long-term co-operation simultaneously increases the value produced by the demand chain and decreases the overall cost of the chain (Frohlich & Westbrook, 2005). Internal integration and external integration with suppliers and customers should be prerequisite to pursue sustainable performance growth. It is important to achieve a high level of efficiency, a high level of customer service and the ability to respond effectively to a changing environment. Performance measurement selection is a critical step in the design and evaluation of any supply

chain integration. It has been identified that the necessary components are namely the cost, customer responsiveness, resource, output and flexibility. A manufacturing firm will therefore endeavor to evaluate the performance of its feedstock suppliers in order to determine the extent of compatibility for the correct integration decisions.

1.1.3 Supply Chain Performance and Supply Chain Integration

Recent years have seen growth in the importance of integration suppliers, manufacturers and customers (Leenders and Johnson, 2000). Effective integration of suppliers into supply chains serves as a key factor for some companies to gain competitive advantage (Bowersox and Closs, 2006). In this globalized era, most industries will not be able to survive by simply optimizing internal structures and infrastructures based upon business strategy. The most successful manufacturers seem to be those that have carefully linked their internal processes to external suppliers and customers in unique supply chains. The trends can be seen as below, where today's dynamic era, e-business and supply chain are integrated and play a vital role towards an organization's competitive advantage and sustenance (Ghoshal and Bartlett, 1997).

Manufacturing organizations orientation towards customer satisfaction has brought the realization of potential benefits and importance of strategic and cooperative buyer-supplier relationships. Organizations have to involve strategic suppliers in resource management decisions (Morgan and Monczka, 2006). Instead of relying on tools such as acceptance sampling to establish the quality of incoming materials and component parts, manufacturers purchase from a more limited number of qualified or certified suppliers to ensure effective supply chain performance (Inman and Hubler, 2003).

Premkumar (2008) pointed that a higher level of information sharing improves performance of supply chain. Increasing communication between company and suppliers encourages information sharing including market information—between the two parties, thus improving performance of the supply chain. A higher level of organic linkage between company and customers through an established information network improves company-customer relationship, thus improving performance of supply chain. The supplier involvement in supply chain can exert effort to improve the quality of material it supplies to the manufacturer. The manufacturer then makes the product and sells it through its retailer exclusively. Cachon and Harker (2002) and Gilbert et al. (2006) show that competing firms may benefit from outsourcing production to a common supplier as this dampens the price competition. Most of the companies extensively integrate their organization with upstream suppliers and downstream customers by pursuing a strategy with a broad arc of integration (Poirer, 2009). The higher the level of integration with suppliers and customers in the supply chain the easier the practice of organization coordination. Poirer (2009) noted that companies with the greatest arcs of supplier and customer integration have the largest rates of performance improvement.

1.1.4 Manufacturing Sector in Kenya

The manufacturing industry is a major player in the Kenyan economy (Kenya Association of Manufacturers, 2013). They include commercial food and allied, building, engineering and electrical, footwear and personal use, leather, medical equipment, metal welding, mining, paper and paper board, plastics and rubbers, textiles and timber sector. Considering the country's aim in industrialization by the year 2030, the manufacturing firms are expected to play an important role. Although

Kenya's manufacturing firms are small, they are among the most sophisticated in East Africa. The manufacturing sector has been growing since the late 1990s and into the new century. The manufacturing companies in Kenya are relatively diverse. The growth rate of the manufacturing industry is primarily driven by growth rates and market trends within various end markets. Growth rates vary from a low of 3.2% for beverages to a high of approximately 5% for health care products (KAM, 2007). The future growth of the Manufacturing sector will depend on what extent industry specific policies are adopted to rationalize and restructuring the whole manufacturing sector (Odhiambo, 2001).

Manufacturing accounts for 13% of gross domestic product (GDP) of Kenya's industrial sector (KAM, 2007). The Government of Kenya recognizes the important contribution of the sector to the country's industrialization process. This sector creates the breeding ground for the small industries. The employment trend of the small enterprise is noticeable. In 2003 total employment in the sector was estimated at 7.3 million persons. The growth in employment was almost entirely attributable to the increase in employment in the manufacturing SMEs (KNBS, 2004). According to KNBS (2007), the improved performance in the various sectors of the economy was affected in the creation of new jobs in both the modern and informal sectors. Overall, the economy generated 469,000 new jobs in 2006-2007 financial year, which was an increase of 5.7 % from the previous year. KAM (2009) notes that one of the major challenges that SMEs face in the course of doing business in Kenya is inadequate business information. Others include: lack of and/or inadequate managerial training and education and skills, lack of access to credit both for start up and expansion of the business, unfavorable national policy and regulatory environment.

Kenya Association of Manufacturers (KAM) notes that 80% of the manufacturing industries are situated in Nairobi. These include industries manufacturing steel products, plastic goods, soaps, flour, vegetable oil, canned fruit and fruit juice, horticulture, and dairy and poultry farming. The major concern is how materials functions are organized and actually who is responsible over these functions in the manufacturing firms. According to the Kenya Association of Manufacturers (2013) There were 549 companies in total registered with KAM out of which about 300 companies operating in Nairobi cutting across 12 key manufacturing sectors involved in manufacturing of food, beverages and tobacco; textile and apparels; timber, wood products and furniture; pharmaceutical and medical equipments; metal and allied and plastics and rubber.

In the study carried in Nairobi on the characteristics of manufacturing firms, Nyambura, (2002) observed that the emergence of local entrepreneurs in food processing has been hampered by attitude and lack of accessibility to key factors of production. Locally produced goods by small enterprises were perceived as inferior hence low demand, which contributed to their performance. According to a World Bank (2005) report on the current situation of the manufacturing firm competitiveness project, pointed that there has been decline in the efficiency of capital and factor productivity in the sector. Some of the constraints noted for example by Kirui (2005) include unfavorable regulations, poor infrastructure, inadequate access to finance, access to markets, technology and poor coordination of supply chain.

1.2 Research Problem

Coordination of supply chain operations amongst companies is become strategically important as new forms of organization are taking place such as virtual enterprises,

global manufacturing and networks manufacturing and different company-to-company alliances (D'Amours, 1999). The most successful manufacturers seem to be those that have carefully linked their internal processes to external suppliers and customers in unique supply chains. The trends can be seen where today's dynamic era, e-business and supply chain are integrated and play a vital role towards an organization's competitive advantage and sustainability. Manufacturing organizations orientation towards customer satisfaction has brought the realization of potential benefits and importance of strategic and cooperative buyer-supplier relationships. Organizations began to involve strategic suppliers in resource management decisions (Morgan & Monczka, 2006).

In all these organizations, the supply chain measurement is directly and or indirectly measured by key performance indicators within the managerial positions of procurement department, cost accounting department, quality department, production , warehouse and distribution and customer service and logistics departments. However, there are various challenges facing these supply chain functions triggered by frequent supply operation disruptions caused by issues facing the suppliers of the various materials. For example power outage at a bottle supplier with cause a supply delay in the bottles for as long as the particular supplier takes to rectify their issue. According to Narasimhan and Kim (2002) increased external integration with suppliers improves performance of supply chain in terms of productivity growth, quality, delivery and flexibility. Overall improvement in internal integration across the supply chain directly improves performance of supply chain (Premkumar, 2002). Marvick and White (1998) manufacturers with the broadest arcs of supply chain integration should have the highest levels of performance improvements.

In Kenya, Keiro (2011) carried out a study on factors affecting the effectiveness of supply chain management practices in the manufacturing industry. The study found that top management commitment and supplier development enhanced supply chain management. The study however did not cover the effect of performance of the other partners in the supply chain. Kyengo (2012) did a survey on effect of supply chain strategy on organization competitive advantage. The study found that on-time delivery and effective coordination of the supply chain enhanced customer loyalty which in return enhanced organization competitive advantage. Kamah (2012) did a study on outsourcing and supply chain performance among Mobile Telephone Service Providers in Kenya. Kamah found that suppliers' capability and customer demand analysis were the factors enhancing outsourcing practices among the mobile telephone services provider. Despite the importance of supply chain integration no study has been carried out to investigate impact of supply integration on the supply chain performance in the manufacturing firms in Kenya. This study therefore sought to bridge this knowledge gap by answering the following research questions, what are the supply chain integration approaches adopted by the manufacturing firms in Kenya? What are the impacts of the supply integration approaches on supply performance in the manufacturing firms in Kenya?

1.3 Objectives of the Study

The study was guided by the following objectives:

- i. To determine supply chain integration approaches adopted by the manufacturing firms in Kenya.
- ii. To determine the impact of the supply integration approaches on supply performance in the manufacturing firms in Kenya.

1.4 Value of the Study

The government can use the study information to develop support programs and strategies that can enhance supply operation within the government enterprises. Such finding is crucial in the evolution of appropriate policies for promoting manufacturing sectors by development and increasing the county's resources as well as ensuring development millennium goals such as vision 2030. The Government may use the finding as a policy framework within which this sector can be enhanced to create more employment opportunities and enhance organization survival.

The findings of this study will be most useful to the manufacturing industries as they will be in a better position to understand the approaches that they can be apply in order to enhance their competitiveness and be conversant with best ways in regards to supply chain operation, competitiveness and profit sustainability. It is hoped that the study findings will help unsuccessful manufacturing industries to take off and also new companies to succeed while existing ones even grow bigger.

The findings of this study are expected to be of great importance to various researchers and scholars. The documented report of this study will be easily acquired

in the library and it will equip the learners with more knowledge and applicable approaches in eliminating supply chain operation inefficiency. The study will further make a myriad contribution to the literature can be employed to eliminate supply chain operation inefficiency which will be part of articles that will be useful to researchers who want to further in this study and to other wider stakeholders in academic circles.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter looks at the past studies on the impact of supply integration on supply chain performance. The chapter also presents literature and previous studies that have been conducted on supply integration approaches and their link to supply chain management and organization competitiveness.

2.2 Supply Chain Integration

Supply chain integration is recognized as a strategy for improving business performance in highly competitive environments. In recognition of this, manufacturing firms have been pursuing a variety of supply chain management practices (Morash & Clinton, 2008). Supply chain integration has been conceptualized in various levels: functional, internal and external, encompassing customer, manufacturing, distribution, and purchasing issues. Saunders (1997) suggested that there are two interrelated forms of integration that manufacturers regularly employ. The first type of integration involves coordinating and integrating the forward physical flow of deliveries between suppliers, manufacturers, and customers. The second integration method is backward integration. Backward integration enables the manufacturer to make a better prediction of the input price and, therefore, a more profitable investment decision.

Supply chain integration, links a firm with its customer, supplier and other channel members by integrating their relationships, activities, functions, process, and locations. From supply chain management literature, integration is closely associated

with performing activities in several areas and with certain intensity in each of those areas. Integrative activities can be developed in different areas such as flow of goods, planning and control, organization, and flow of information (Donk & Van Der Vanet, 2005). Bowersox (2006) propound that the process of supply chain should progress from the integration with supplier and customer. The external and internal integration can be accomplished by continuous standardization of each internal logistic function and by efficient information sharing and strategic linkage with supplier and customer.

Coordination of supply chain operations amongst companies is become strategically important as new forms of organization are taking place such as virtual enterprises, global manufacturing and networks manufacturing and different company-to-company alliances (D'Amours, 1999). The important of time as a competitive weapon and the ability to meet customer and market demand with shorter delivery times is important and has been recognized in this circumstance. Several companies are stressing flexibility and agility in order to response to the unique needs of customer and markets. Getting the right product, at the right price and at the right time to the consumer is not only crucial to competitive success but also the key to survival. These are crucial elements for consideration when attempting to establish a new supply chain strategy. Having the right product available, in the right place at the right time, enables the business to compete in this volatile market-place (Anatan, 2006).

2.3 Supply Chain Performance

Supply chain management, analysis, and improvement are becoming increasingly important. Neely et al. (2005) present a few of the categories in the literature, including: quality, time, flexibility, and cost. This categorization is a useful tool in systems analysis. For example, a model may be developed to improve one

characteristic of a system, for example, time. The model may then compare manufacturing lead time or due-date performance by changing the system's configuration. Beamon (2006) identified and evaluated various individual supply chain performance measures. The author concluded that significant weaknesses were present in each of the performance measures evaluated, based on such criteria as inclusiveness, universality, measurability and consistency. Although the supply chain may be operating under minimum cost, it may simultaneously demonstrate poor customer response time performance, or lack flexibility to meet random fluctuations in demand.

Maskell (2001) suggested that the type of performance measures required for a manufacturing organizations are directly related to the manufacturing strategy chosen by the company. The two reasons cited for establishing and maintaining this relationship are: the company may determine if its performance is meeting its strategic goals and people in the organization will concentrate on what is measured; thus the performance measure will steer company direction. Individual performance measures used in supply chain analysis have been shown to be non-inclusive (Lamming, 2006). Consequently, important supply chain characteristics and their associated interactions have been ignored. Measuring the use of resources, especially cost, has also been identified as an important part of the supply chain.

Many strategic goals of organizations recognize not only the importance of minimizing resources, but also the overall importance of the output of the system. Current supply chain performance measurement systems are inadequate because they rely heavily on the use of cost as a primary (if not sole) measure, they are not inclusive, they are often inconsistent with the strategic goals of the organization, and

do not consider the effects of uncertainty (Camp, 2009). That is, although use of multiple supply chain performance measures may be commonplace in real-world settings, it is not commonplace in supply chain modeling. A performance measurement system for supply chain analysis must be developed that addresses these issues.

Resources are generally measured in terms of the minimum requirements (quantity) or a composite efficiency measure. Efficiency measures the utilization of the resources in the systems that are used to meet the system's objectives. Resource measurement is an important part of the measurement system. Too few resources can negatively affect the output and the flexibility of the system, while the deployment of too many resources artificially increases the system's requirements. One general goal of supply chain analysis is resource minimization. Although a minimum level of output is often specified, the effect of reducing resources on the flexibility of the supply chain is not often considered (Beamon, 2006). A supply chain may be reconfigured with reduced resources while present demands are met, but such short-term analyses do not account for the dynamic nature of demand. In this way, resources are directly related to the system's output and flexibility performance.

2.4 Supply Chain Integration Approaches

2.4.1 Information Sharing

One of the key organizational processes within SCI is information sharing. This refers to the sharing of technological, marketing, production and inventory information across suppliers and customers (Stock and Lambert, 2001). Most of the authors have advocated Information exchange as an importance tool in successful supplier

development processes (Dunn & Young, 2004). Burton (2000) defined information exchange as the relaying of business-related information in a way that enables the recipient to take action. Mentzer (2004) highlighted the importance of information sharing in the supply chain in securing competitive advantage in a variety of ways, including improved understanding of market trends and customer needs, the acquisition of new ideas for products, and identification of ways of improving production methods and reducing total cycle time.

SCI has long been thought of as the management of a firm's inputs raw materials, services and sub-assemblies, into the organization (Dobler & Burt 2003). These goods and services have to be purchased from approved sources of supply and would have to conform to required quality levels and delivery schedules. Moberg (2000) noted the premise behind SCM (supply chain management) is that the sharing of information and coordination of strategies among firms in a supply chain can reduce total logistics costs and enhance value delivered to the customer. Sako (2004) posited that higher levels of information exchange between organizations in a supply chain lead to lower inventories and higher levels of customer satisfaction.

Supply chain business process integration involves collaborative work between buyers and suppliers, joint product development, common systems and shared information. According to Cooper (2004) operating an integrated supply chain requires continuous information flows, which in turn assist to achieve the best product flows. However, in many companies, management has reached the conclusion that optimizing the product flows cannot be accomplished without implementing a process approach to the business. The key supply chain processes stated by Cooper (2004) are: Customer relationship management, Customer service management, Demand

management, Order fulfilment, service flow management, Supplier relationship management, Product development and commercialization and Returns management.

2.4.2 Supplier Participation

SCI activities simply begin with the supplier's promise to fulfil buyer's requests. However, those promises and expectations are generally vague and uncertain in nature, especially for technology-intensive procurement projects (Neef, 2001). Promises, expectation, and discussion mostly involve knowledge interaction and communication (Alshawi, 2001). The current interest in SRM (supplier relationship management) among academics and business practices focuses more on basic transactional issues, particularly the sourcing and trading including supplier selection, quality/cost demands, and supplier capabilities/evaluation (Alshawi, 2001).

Resource allocation clearly testifies to people throughout the organization, that the goal is important and that the senior manager is serious about it (Lindsey, 1989). Lindsay noted that resource allocation to specific strategies communicates to others within the firm where priorities have been positioned and conveys authority, power and status. In line with Easton (2000) findings, showed that where supply chain leadership dedicated greater resources to spend more time at suppliers' locations as a result of greater supplier development results. Nelson (2004) determined two key elements: lean supplier development requires an organization to invest in talent and resources with knowledge in activities to improve a supplier's performance and (the activity requires a long-term commitment by the leadership of the organization. Purchasing plays a key role in spanning functions by fostering relationships and

communication to improve quality performance for both the supplying and the buying firm (Paulraj & Chen, 2005).

Chatterjee and Mazumder (2010) observed that businesses that want to make a transition to a greener supply chain should review all their business processes to identify areas where adopting a greener outlook can actually improve their business. SCI can be prepared after a careful analysis of supply markets while taking into considerations, a long term view of developments in the market to enable an organization adapt to any change that may impact on its service delivery from by analyzing potential and transparent suppliers.

2.4.3 Organization Coordination

Today's customers have become sophisticated because of access to freely available information. Bowersox (2009) defined a customer as the ultimate end user of the product or service whose needs or requirements must be accommodated. He further observes that for an organization to achieve its goals, it must be more effective than competitors in identifying specific customer needs and focusing resources and activities on accommodating these customer requirements. Lee (2000) pointed that external coordination activities are important to improve trust and commitment across the supply chain partners and to help the partners to delegate decision making.

Mentzer (2000) suggests that joint system development and shared decision making with suppliers and customers enhances the understanding of management decisions across the partners and, consequently, promotes the sharing of risks and resources within the supply chain. This tends to reduce development cost and time, and improve profit margins, in product development. Kahn (2001) argues that internal coordination

activities increase the understanding of the goals and activities among different functional units, which improves mutual trust and commitment to the organization. As people trust each other and are more committed to their organizations, they are motivated to seek further coordination, which in turn improves product development performance (Bstieler, 2006). Frishammar and Horte (2005) also found that collaboration among internal units is positively related to product innovation.

Supply chain integration if well utilized can be an important tool in channeling the resources of public organizations towards service delivery to the satisfaction of customers. Before any procurement transaction is enhanced, procuring entities must determine their procurement needs which are supposed to be consistent with the organization's objectives. The assessment should take account of the need to ensure that the procuring entity uses its resources effectively and efficiently (Prugsamatz, 2010). Supply chain integration should always support the attainment of the business goals (Mazumder, 2010).

2.5 Impact of the Supply Integration Approaches on Supply Performance

Nowadays, competitiveness in marketplace depends closely on the ability of a firm to grip the challenges of reducing lead-time, cost estimation, increasing customer service levels and improving product quality. Competing in global competition, where partnership are needed as the ideal coordination mechanism for business relationship, operating efficiency and productivity across functional area in organization become an important aspect as source of competitive advantage. Frohlich and Westbrook (2001) describe the strategic importance of supply chain integration and argue that this integration can be defined in terms of the direction (toward suppliers and/or customers) and the degree of supply chain activities. Frohlich and Westbrook's study,

Rosenzweig et al. (2003) argue that highly integrated firms will gain competitive advantage over their competitors due to the increased information visibility and operational knowledge shared among members of their supply chain, as well as the reduction of the overall supply chain costs (Rosenzweig et al., 2003).

According to Ballou (2004) supply chain integration as partnership-based coordination links a firm with its customer, supplier, and other channel members by integrating their relationships, activities, functions, process, and locations. Backward and forward integration are strategic initiatives companies may perform to reduce risks and interdependencies with external business partners in the supply chain (Narasimhan & Kim (2002). Fundamentally, companies may increase their control over a wider scope of the supply chain by performing backward or forward integration and increase their own decision-making power over key resources and competencies important to the competitiveness of the organization.

The purpose of the integrated supply chain is to create easiness in terms of information, material as well as cash flows (Stevens 1989). The ever increasing depth, size and complexity of the global market put more emphasis in links and collaborations between supply chain parties in order to improve coordination and manufacturing sustainability (Saad & Arirguzo, 2007). The aim of integration within the supply chain is to ensure commitment to cost and quality, as well as achieving minimum distortion to plans, schedules and regular delivery of small volumes of orders (Yusuf et al, 2004). Many firms wish to achieve the benefits of both responsiveness and low cost (Hull, 2005). The opportunity to use process integration across functional boundaries is now considered a key to competitive success. Swink (2007) argued that supply chain integration is a key to obtain competitive advantage

in the current e-global environment. Effective integration of suppliers into product value/supply chains will be a key factor for some manufacturers in achieving the improvements necessary to remain competitive.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a general approach to studying a research topic. This chapter, therefore, explores how the research was carried out. It involved a blueprint for the collection, measurement and analysis of data. Specifically the following subsections are included; research design, population, population design, data collection and data analysis.

3.2 Research Design

This study employed a descriptive research design. A descriptive research design attempts to describe or define a subject, often by creating a profile of a group of problems, people, or events, through the collection of data and tabulation of the frequencies on research variables or their interaction (Cooper & Schindler, 2006). It is concerned with describing the characteristics of a particular individual, or of a group. In this case, the research problem was to investigate approaches employed in optimizing the supply chain performance in the manufacturing sector. A descriptive research defines questions, people surveyed and the method of analysis prior to beginning of data collection. Thus, this approach is appropriate for this study, since the researcher intends to collect detailed information through descriptions and the method is also useful for identification of variables and hypothetical constructs.

3.3 Population

The target population in this study was manufacturing firms registered with Kenya Association of Manufacturers (KAM) and operating in Nairobi. There are 549

companies in total registered with KAM out of which about 300 companies are in Nairobi (KAM, 2013).

3.4 Population Design

This study adopted a non-probability population design. According to Kothari (2004) non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected. A sample of 30 companies was selected for this study; this is because 10-40% respondents and above is considered adequate in a survey of this kind (Kothari, 2004). The selected companies were chosen since they met the objective of the study. Using stratified sampling approach, (See Appendix III) companies in Nairobi were classified into three categories; small (10 to 49 employees), medium (50 to 99 employees), and large (100 and above employees) companies. This classification was adopted from KIRDI baseline survey of 1997 and Private Sector Development Strategy paper 2006-2010 by Ministry of Trade and Industry, Government of Kenya. Two (2) questionnaires were distributed out to two respondents (from supply chain department and IT) of the thirty (30) companies selected, giving a total of sixty (60) respondents.

3.5 Data Collection

This study relied mostly on primary data. Primary data was collected using a questionnaire. The questionnaires had both open and close-ended questions. The close-ended questions provided more structured responses to facilitate tangible recommendations. The closed ended questions was used to test the rating of various attributes and this helped in reducing the number of related responses in order to

obtain more varied responses. The open-ended questions were used to provide additional information that might not have been captured in the close-ended questions. The researcher administered the questionnaire to all respondents of the study. The researcher exercised care and control to ensure all questionnaires issued to the respondents are received. To achieve this, the researcher maintained a register of questionnaires, which were sent, and which were received. The questionnaires were administered using the drop and pick later method.

3.6 Data Analysis

Before processing the responses, the completed questionnaires were edited for completeness and consistency. The data was then coded to enable the responses to be grouped into various categories. The data collected was mainly quantitative; however some qualitative data was collected from the open ended questions to enhance and uncover any convergent and divergent views. As such, descriptive statistics were employed and used to summarize the data. This included percentages and frequencies. Descriptive statistics were used to measure the quantitative data which were analyzed using the statistical analysis. Tables and other graphical presentations as appropriate were used to present the data collected for ease of understanding and analysis. The researcher used the data with an aim of presenting the research findings in respect to study objective. In addition, inferential statistics such as multiple regression analysis and correlation were used to determine the relationship between the independent and dependent variables.

The regression equation was:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \alpha$$

Where: **Y** is the dependent variable (supply chain performance),

β_0 is the regression coefficient/constant/**Y**-intercept,

β_1 , β_2 , β_3 and β_4 are the slopes of the regression equation,

X1 is Information sharing

X2 is Supplier's participation

X3 is Organization coordination,

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents analysis of the data on the impact of supply integration on the supply chain performance in the manufacturing firms in Kenya. This chapter presents the findings of the study and discussions on the findings. The findings were intended to answer the study's research questions. Data collected was collated and reports were produced in form of tables and figures and qualitative analysis done in prose. The study targeted a sample of 60 respondents from manufacturing firms in Kenya. However, out of 60 questionnaires distributed 49 respondents completely filled in and returned the questionnaires, this represented a 82% response rate. This is a reliable response rate for data analysis as Mugenda and Mugenda (2003) pointed that for generalization a response rate of 50% is adequate for analysis and reporting, 60% is good and a response rate of 70% and over is excellent.

4.3 Demographic Characterization of the Respondents

The research requested the respondents to indicate the duration of working in the organization, highest level of education qualification, department of working and the position they held.

4.3.1 Working Duration

Figure 4.1 illustrates working duration of the respondents in their respective organization, from the findings most (48%) of the respondents had worked in the organization for a period of 1-5 years, 27% had worked for a period of above 16

years, 15% had worked for a period of 11-15 years while the rest (10%) had served in the organization for a period of 6-10 years. This implies that most of the respondents of this study had worked for an ample time thus they were conversant with the information that the study sought pertaining to the organization.

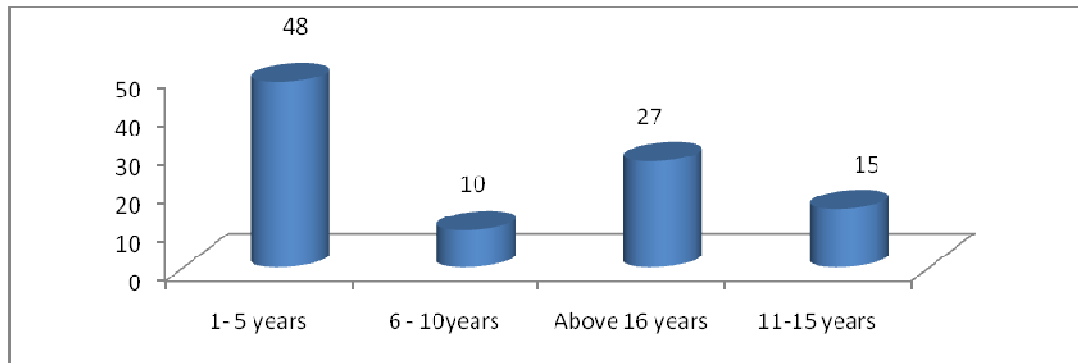


Figure 4.1 Working Duration

4.3.2 Level of Education

The researcher was also inquisitive to determine the highest level of the academic qualification that the respondent held. Majority (55%) of the respondents were undergraduate, 43% were postgraduate while the rest 2% had acquired diploma as their highest academic qualification. From the findings, it is clear that majority of the respondents had adequate knowledge that is required to enhance organization supply chain performance.

4.3.3 Department of Working

The researcher requested respondents to indicate departments in which they were working at in the organization. Majority (59%) of the respondents were working at supply chain department, 35% were serving at Information Technology department while the rest 6% of the respondents were serving at other departments such as

finance, PR department etc. This implies that all departments that were targeted by the study were involved and that the finding is reliable.

4.3.4 Position held by the Respondents in their Respective Department

The study aimed to investigate position held by the respondents within their department. From the findings (33%) of the respondents were unit heads, 22% were assistance manager, 18% were technical personnel, 14% were departmental heads, 9% were managers while 4% were supervisors. This depicts that all participant of the study were under the level at which the study targeted as stipulated in previous chapter and that the information is reliable.

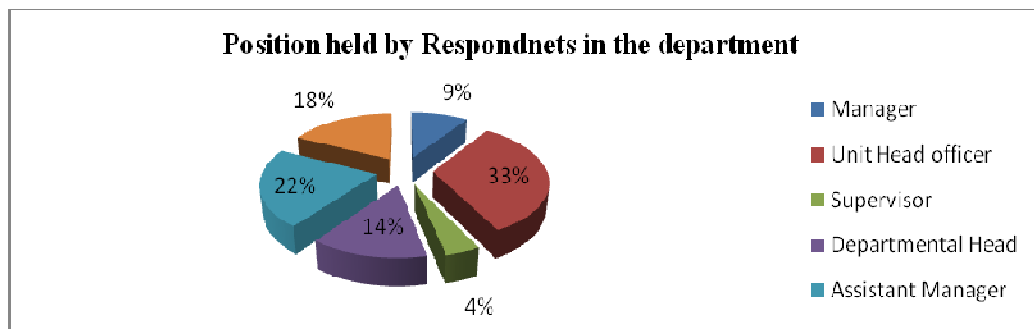


Figure 4.2 Position held by the Respondents in their Respective Department

4.3.5 Consideration of Supply Chain Integration and Supply Chain Performance

The researcher requested respondents whether their organizations consider supply chain integration as a tool for improving supply chain performance. Majority (90%) of the respondents alleged that they consider Supply chain integration to enhance supply chain performance while the rest (10%) opposed the opinion of majority. Morash and Clinton (2008) pointed that supply chain integration is recognized as a strategy for improving business performance in highly competitive environments

where manufacturing firms have been pursuing a variety of supply chain management practices.

4.4 Information sharing

4.4.1 Encouragement of Information Sharing

The study asked respondents whether their organization encourage information sharing. From the findings, majority (96%) were of the opinion that their organization encourages information sharing while 4% alleged that no information sharing practice. This reveals that for effective supply chain management practices departments should be involved in giving out the information that derives to the quantity and quality of the material needed as well as the previous material. The study conforms with Mentzer (2004) that the importance of information sharing in the supply chain in securing competitive advantage through improved understanding of market trends and customer needs improving production methods and reducing total cycle time.

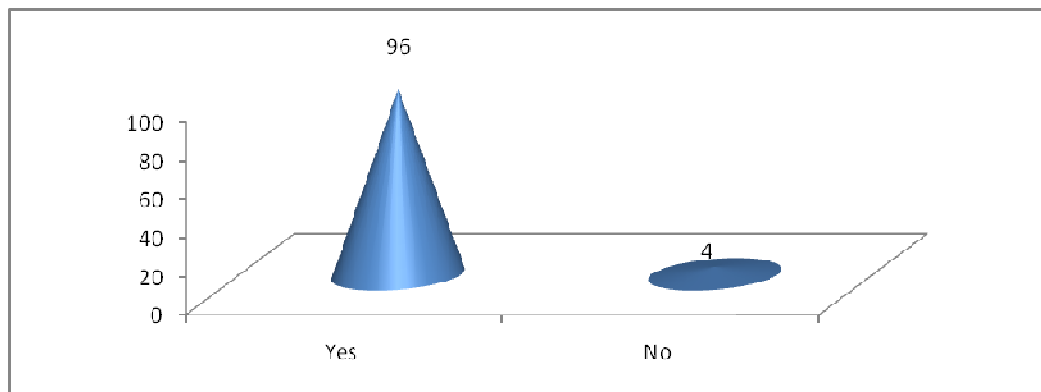


Figure 4.3 Encouragement of Information Sharing

4.4.2 Information Shared in the Organization

Table 4.5 indicates the kind of the information shared within the organization. Most (37%) of the respondents indicated in the supply chain integration inventory information is shared, (22%) of the interviewed respondent indicated that marketing information and production information is highly shared within organizations as indicated in each case while the rest (18%) indicated that technological information is shared. According to Cooper (2004) operating an integrated supply chain requires continuous information flows, which in turn assist to achieve the best product flows. Supply chain business process integration involves collaborative work between buyers and suppliers, joint product development, common systems and shared information.

Table 4.1 Information Shared in the Organization

	Frequency	Percent
Technological information	9	18
Marketing information	11	22
Production information	11	22
Inventory information	18	37
Total	49	100

Source: Researcher, (2014)

4.4.3 Influence of Information Sharing on Supply Chain Performance

Table 4.6 illustrates the finding of the study on the respondent level of agreement on influence of information sharing on supply chain performance. From the findings, most of the respondents agreed that reducing total cycle time influence supply chain performance as indicated by a mean of 4.01, respondents also agreed that acquisition

of new ideas for products influence supply chain performance as depicted by mean of 3.77, Reducing total logistics costs influence supply chain performance as illustrated by mean of 3.74, identification of ways of improving production methods influence supply chain performance as illustrated by mean of 3.70, enhance value to the customer influence supply chain performance as depicted by mean of 3.66, respondents also agreed that supplier development processes influence supply chain performance as shown by mean score of 3.64, lastly respondents agreed that improved understanding of market trends and customer needs influence supply chain performance as depicted by mean score of 3.52. Sako (2004) posited that higher levels of information exchange between organizations in a supply chain lead to lower inventories and higher levels of customer satisfaction. Likewise, Dunn and Young (2004) highlighted that advocated Information exchange as an importance tool in successful supplier development processes (Dunn & Young, 2004).

Table 4.2 Influence of Information Sharing on Supply Chain Performance

	Mean	STDev
Improved understanding of market trends and customer needs	3.52	1.168
Acquisition of new ideas for products	3.77	1.297
Identification of ways of improving production methods	3.7	1.198
Reducing total cycle time	4.01	0.196
Supplier development processes	3.64	1.284
Reducing total logistics costs	3.74	1.041
Enhance value to the customer	3.66	1.133

Source: Researcher, (2014)

4.5 Supplier's Participation

4.5.1 Set Programs to Enhance Supplier's Participation

Figure 4.4 depicts result of the findings on set programs to enhance supplier's participation. From the findings, most (31%) of the respondents indicated that they have set policies on quality of supplies, 29% indicated that they have policies on suppliers evaluation, 22% have policies on suppliers selection while the rest (18%) had set policies on suppliers capabilities. This implies that supplier's participation influence supply chain performance.

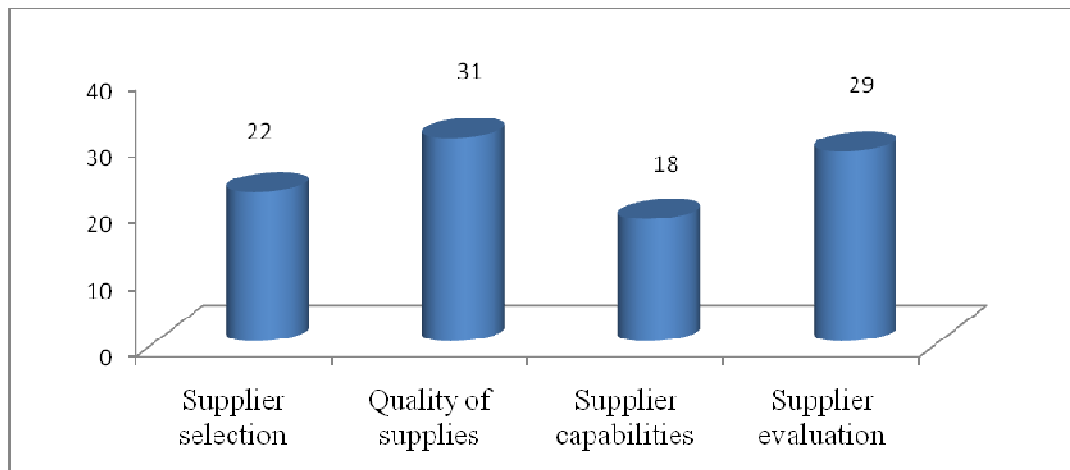


Figure 4.4 Set Programmes to Enhance Supplier's Participation

4.5.2 Influence of Suppliers Relationship on Supply Chain Performance

The researchers requested the respondent to indicate their level of agreement on the statement relating to suppliers relationship on supply chain performance. From the findings most of the respondents agreed that purchasing plays a key role in fostering relationships and communication to improve quality performance for both the supplying and the buying firm as shown by mean score of 4.15, respondents also

agreed that Supply chain leadership dedicated greater resources to spend more time at suppliers' locations as a result of greater supplier development and that their organization invest more in talent and resources to improve a supplier's performance and activity that requires a long-term commitment by the leadership of the organization as depicted by mean score of 3.74 and 3.73 respectively. Respondent were neutral that they review their business processes to identify areas where adopting a greener outlook can actually improve their business as illustrated by mean score of 3.44. The findings were in line with Easton (2000) findings that where supply chain leadership dedicated greater resources to spend more time at suppliers' locations as a result of greater supplier development results. Additionally, Paulraj and Chen (2005) opined that purchasing department plays a key role in spanning functions by fostering relationships and communication to improve quality performance for both the supplying and the buying firm (Paulraj & Chen, 2005).

Table 4.3 Influence of Suppliers Relationship on Supply Chain Performance

Statements	Mean	STDev
Supply chain leadership dedicated greater resources to spend more time at suppliers' locations as a result of greater supplier development	3.47	0.90
Purchasing department plays a key role in fostering relationships and communication to improve quality performance for both the supplying and the buying firm	4.15	1.01
Our organization invest more in talent and resources to improve a supplier's performance and activity that requires a long-term commitment by the leadership of the organization	3.73	0.87
We review our business processes to identify areas where adopting a greener outlook can actually improve their business	3.44	0.94

Source: Researcher, (2014)

4.6 Organization Coordination

4.6.1 Realization of Organization Coordination on Supply Chain Integration

The study requested the respondent to indicate whether the organization realized effective organization coordination through supply chain integration. From the findings, 77% of the respondents pointed out that their organization have realized significant supply chain coordination through supply chain integration (23%) indicted that the organization had not realized supply chain coordination as projected. The finding conforms with Bowersox (2009) finding that for an organization to achieve its goals, it must be more effective than competitors in identifying specific customer needs and focusing resources and activities on accommodating these customer requirements.

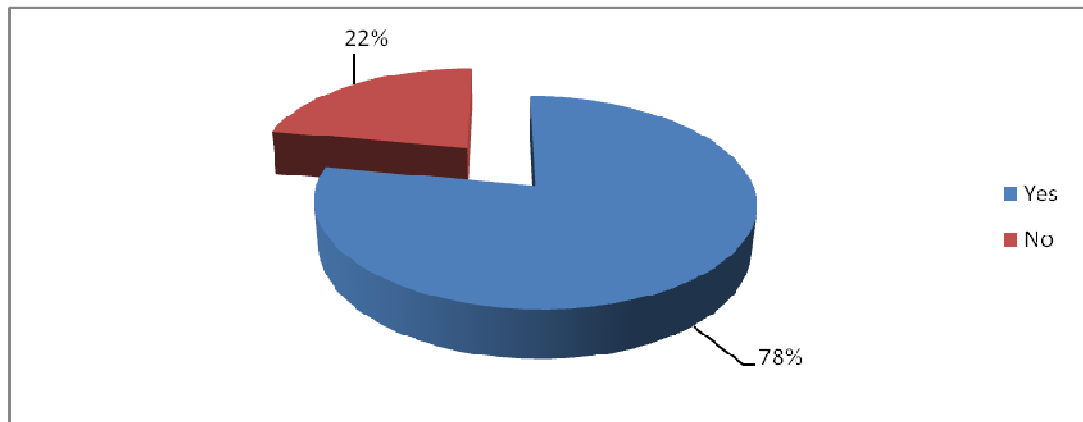


Figure 4.5 Realization of Organization Coordination on Supply Chain Integration

4.6.2 Organization Coordination and its Impact on Supply Chain

Table 4.8 summarizes respondents' level of agreement on impact of organization coordination and its impact on supply chain performance. Most of the respondents

agreed that their organization is more effective than competitors in identifying customer needs and focusing resources that are accommodating customer requirements as depicted by mean score 3.71, respondent also agreed that Joint system development and shared decision making with suppliers and customers enhances the understanding of management decision as shown by mean score of 3.66, They consider external coordination activities as important to improve trust and commitment across the supply chain partners as illustrated by mean score of 3.62, respondent further agreed that Supply chain integration coordination reduce development cost and time, and improve profit margins, in product development as depicted by mean score of 3.54. On the other hand respondents neither disagreed nor agreed that organization coordination promotes the sharing of risks and resources within the supply chain as shown by mean score of 3.25, Supply chain integration should always support the attainment of the business goals as illustrated by mean score of 3.14. Internal coordination activities increase the understanding of the goals and activities among different functional units, which improves mutual trust and commitment to the organization as depicted by mean score of 3.03. Lee (2000) pointed that external coordination activities are important to improve trust and commitment across the supply chain partners and to help the partners to delegate decision making. Likewise, Kahn (2001) found that internal coordination activities increase the understanding of the goals and activities among different functional units, which improves mutual trust and commitment to the organization.

Table 4.4 Influence of Organization Coordination on Supply Chain performance

	Mean	STDev
Our organization is more effective than competitors in identifying customer needs and focusing resources that are accommodating customer requirements	3.71	1.067
We consider external coordination activities as important to improve trust and commitment across the supply chain partners	3.62	1.133
Organization coordination promotes the sharing of risks and resources within the supply chain	3.25	0.91
Joint system development and shared decision making with suppliers and customers enhances the understanding of management decision	3.66	1.027
Supply chain integration coordination reduce development cost and time, and improve profit margins, in product development	3.54	1.121
Internal coordination activities increase the understanding of the goals and activities among different functional units, which improves mutual trust and commitment to the organization	3.03	0.942
Supply chain integration should always support the attainment of the business goals	3.14	0.947

Source: Researcher, (2014)

4.7 Impact of Supply Chain Integration on Supply Chain Performance

The respondents were requested to indicate the impact of supply chain integration on supply chain performance. From the findings, most of the respondent indicated that supply chain integration has improved product quality as depicted by mean score of 4.47. Respondents agreed that through supply chain integration organization have gained competitive advantage as illustrated by mean score of 4.25. Timely delivery of orders and utilization of resources has improved through supply chain integration as

depicted by mean score of 4.19 and 4.11 respectively. Through supply chain integration organizations have been able to attain of strategic goals, reduce risks and improve internal and external coordination of operation process as shown by mean score of 3.84, 3.63 and 3.56 respectively. Further respondents were neutral that supply chain integration influence operating efficiency of the organization as shows by mean score of 3.18.

Table 4.5 Impact of Supply Chain Integration on Supply Chain Performance

	Mean	STDev
Improving customer service level	3.67	1.131
Improved product quality	4.47	0.168
Operating efficiency	3.18	0.948
Gain competitive advantage	4.25	0.097
Reduce risks	3.63	0.808
Timely delivery of orders	4.19	0.483
Efficient utilization of resources	4.11	0.32
Improve coordination	3.56	0.913
Attainment of strategic goals	3.84	0.746

Source: Researcher, (2014)

4.8 Inferential Analysis

To establish the relationship between the independent variables and the dependent variable the study conducted inferential analysis which involved coefficient of correlation, coefficient of determination and multiple regression analysis.

4.8.1 Karl Pearson's Correlation Analysis

In trying to show the relationship between the study variables and their findings the study used the Karl Pearson's coefficient of correlation (r). According the findings, it was clear that there was a positive correlation between supply integration and information sharing as shown by a correlation figure of 0.052, it was also clear that there was a positive correlation between supply integration and organization coordination with a correlation figure of 0.7140, it was also clear that there was also a positive correlation between supply integration and level of suppliers' participation with a correlation value of 0.5210. This shows that there was positive correlation between supply integration and Information Sharing, organization coordination and suppliers' participation.

Table 1.6 Coefficient of Correlation

		Supply Integration	Information Sharing	Organization coordination	Suppliers participation
Supply Integration	Pearson Correlation	1			
	Sig. (2-tailed)				
Information Sharing	Pearson Correlation	.0520	1		
	Sig. (2-tailed)	.0032			
Organization coordination	Pearson Correlation	.7140	.3341	1	
	Sig. (2-tailed)	.0021	.0014		
Suppliers participation	Pearson Correlation	.5210	.3610	.0000	1
	Sig. (2-tailed)	.0026	.0034	1.000	

Source: Researcher, (2014)

4.8.2 Coefficient of Determination

In addition, the study conducted a multiple regression analysis so as to analyze impact of supply integration on the supply chain performance in the manufacturing firms in Kenya. The study applied the statistical package for social sciences (SPSS) to code, enter and compute the measurements of the multiple regressions for the study.

From the findings 86.3% of supply integration on the supply chain performance is attributed to combination of the three independent variables (Information Sharing, organization coordination and suppliers' participation) investigated in this study. A further 13.7% of the effective supply chain management is attributed to other factors not investigated in this study.

Table 4.7 Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.981(a)	0.863	0.691	0.752

Source: Researcher, (2014)

4.8.3 Multiple Regression Analysis

The study conducted a multiple regression analysis so as to determine the relationship between effective Supply Chain Management and the four attributes investigated in this study. The regression equation ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \alpha$) was used:

$$Y = 1.413 + 0.246X_1 + 0.359X_2 + 0.215\beta_4X_4 + 0,$$

Whereby Y = Supply integration,

X_1 = Information Sharing X_2 = Organization coordination,

X_3 = Suppliers' Participation

According to the regression equation established, taking all factors (Information Sharing, organization goal and suppliers' participation) constant at zero, supply chain performance in the manufacturing sector will be 1.413 as a result of these independent variables. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in information sharing will lead to a 0.246 increase in effective supply chain performance in manufacturing sector. A unit increase in organization coordination will lead to a 0.359 increase in supply chain performance in the manufacturing sector while a unit increase suppliers' participation will lead to a 0.168 increase in supply chain performance in the manufacturing sector. This therefore implies that all the three variables have a positive relationship with organization goal contributing more to supply chain performance in the manufacturing sector, while level of suppliers' participation contributes the least to supply chain performance in the manufacturing sector.

Table 4.8 Multiple Regression Analysis

		Unstandardized Coefficients	Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	1.413	1.068		1.739	0.033
Information Sharing	0.546	0.203	0.135	0.619	0.016
Organization coordination	0.519	0.193	0.08	0.358	0.024
Suppliers' participation	0.502	0.16	0.346	1.284	0.044

Source: Researcher, (2014)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the data findings on impact of supply integration on the supply chain performance in the manufacturing firms in Kenya, the conclusions and recommendations are drawn there to. The chapter is therefore structured into summary of findings, conclusions, recommendations and area for further research.

5.2 Summary of the Findings

The objectives of this study were to determine supply chain integration approaches adopted by the manufacturing firms in Kenya and to determine the impact of the supply integration approaches on supply performance in the manufacturing firms in Kenya.

From the study findings it was clear that organizations encourages information sharing such as marketing information, production information and technological information. Reducing total cycle time, acquisition of new ideas for products and reducing total logistics costs influence supply chain performance. Further the study found that enhancing value to the customer, supplier development processes, improved understanding of market trends and customer needs influence supply chain performance.

To supplier's participation, the study found that most organization have set policies on quality of supplies and on suppliers evaluation. Purchasing department plays a key

role in fostering relationships and communication to improve quality performance for both the supplying and the buying firm, that Supply chain leadership dedicated greater resources to spend more time at suppliers' locations as a result of greater supplier development and that their organization invest more in talent and resources to improve a supplier's performance and activity that requires a long-term commitment by the leadership of the organization influence supply chain performance to a great extent.

On influence of organization coordination in supply chain performance, the study found that their organization have realized significant supply chain coordination through supply chain integration. Organizations are more effective than competitors in identifying customer needs and focusing resources that are accommodating customer requirements and that Joint system development and shared decision making with suppliers and customers enhances the understanding of management decision

To the impact of supply chain integration on supply chain performance, the study found that supply chain integration has improved product quality, organization have gained competitive advantage, Timely delivery of orders and utilization of resources has improved through supply chain integration. Through supply chain integration organizations have been able to attain of strategic goals, reduce risks and improve internal and external coordination of operation process

5.3 Conclusion

The study sought to find out the impact of supply integration on the supply chain performance in the manufacturing firms in Kenya. Based on the findings in relation to specific objective, the study concluded that organizations encourages information

sharing such as marketing information, production information and technological information. Reducing total cycle time, acquisition of new ideas for products and reducing total logistics costs influence supply chain performance. Further the study concluded that enhancing value to the customer, supplier development processes, improved understanding of market trends and customer needs influence supply chain performance.

On supplier's participation, the study found that most organization have set policies on quality of supplies and on suppliers evaluation. Purchasing department plays a key role in fostering relationships and communication to improve quality performance for both the supplying and the buying firm, that Supply chain leadership dedicated greater resources to spend more time at suppliers' locations as a result of greater supplier development and that their organization invest more in talent and resources to improve a supplier's performance and activity that requires a long-term commitment by the leadership of the organization influence supply chain performance to a great extent.

To influence of organization coordination in supply chain performance, the study found that the organizations have realized significant supply chain coordination through supply chain integration. Organizations are more effective than competitors in identifying customer needs and focusing resources that are accommodating customer requirements and that Joint system development and shared decision making with suppliers and customers enhances the understanding of management decision

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gained competitive advantage, Timely delivery of orders and utilization of resources has improved through supply chain integration. Through supply chain integration organizations have been able to attain of strategic goals, reduce risks and improve internal and external coordination of operation process.

5.4 Recommendations

The study recommended that it is imperative for companies to cooperative and leverage complementary core resource competencies through partnership-based coordination. For an effective and credible management of the customers and consumers, a joint effort of the suppliers, manufacturers and distributors is required.

Furthermore the study recommended that as supply chain focuses on the processes management within and beyond organizational boundaries, a measure of its performance is necessary for its effective operation and control. The ultimate success of firms will depend on management's ability to integrate the company's intricate network of business relationships, allowing improved decision making and consequently, reducing cost and customer response time.

Finally, the study recommended that in order to improve the supply chain performance, organizations can focus to implement either or all of supply chain integration modes; internal cross-functional process integration; backward integration with key first-tier suppliers, or a natural extension of this integration would involve second-tier suppliers; forward integration with key first-tier customers, or with the customers' customers and complete forward and backward integration, or expressed as integration from "suppliers' supplier to the customers' customer.

5.5 Limitation of the Study

The researcher encountered various limitations that tend to hinder access to information that the study sought. The main limitation of the study was its inability to include more organizations. This study focused only on manufacturing firms in Nairobi. The study could cover more firms across all sectors so as to provide a more broad based analysis. However, due to time and resource the researcher focused only to the manufacturing firms in Nairobi.

Further the study did not involve other manufacturing firms which are not registered with KAM. The study selected a sample of registered manufacturing firms with KAM. However, there are many companies that are not registered with KAM which were not covered in this study.

Further the study encountered challenges such as none-cooperation by staff since it is not easy to convince some employees to fill questionnaires hence not reaching the targeted sample size. However, the researcher assured respondents of proprietary measures that the findings would be accorded and used only for academic purpose.

5.6 Areas of Further study

The study explored impact of supply integration on the supply chain performance in the manufacturing firms in Kenya and specifically focused on information sharing, suppliers' participation and organization coordination. From the study finding, the study suggested that:

A study to be done on risk associated with supply integration through information sharing where the competitors may collaborate with other party and expose some of the strategies that the company use and be used to compete in the market.

A research to be done on the strategies adopted by the organization in implementation of the supply chain integration practices to enhance organization operations.

A study to be done to investigate the extent to which integration might infringe on anti-competition law. This especially relates to the aspect of information sharing.

Further the study recommended that a study be done on the challenges that hinder supply chain integration in order to give both negative and positive aspects of supply chain integration that is reliable in improving organization supply chain performance.

REFERENCES

- Ballou, R. H. (2004). *Business Logistics/Supply Chain Management*, 5th ed., Prentice-Hall, Upper Saddle River, NJ.
- Bowersox, D. J. & Closs, D. J. (2006), *Logistical Management: The Integrated Supply Chain Process*. New York: McGraw-Hill.
- Chopra, S. & Meindl, P. (2004). *Supply Chain Management*, Prentice-Hall, Upper Saddle River, NJ.
- Frohlich, M. T. & Westbrook, R. (2001). Arcs of integration: an international study of supply chain strategies, *Journal of Operations Management*, 19 (2), 185-200.
- Goretti, M. M. (2011). *Supply Chain Operational Challenges Facing the Credit Card Divisions of Commercial Banks in Kenya*. Unpublished MBA project, University of Nairobi.
- Kamah, S. S. (2012). *Outsourcing and Supply Chain Performance among Mobile Telephone Service Providers in Kenya*. Unpublished MBA project, University of Nairobi.
- Kombo, D. K. & Tromp, D. L. A. (2006). *Proposal and thesis writing*. 13th ed. Nairobi: Paulines Publications Africa.
- Kyengo, E. N. (2012). *Supply Chain Strategy and Competitive Advantage of Nation Media Group*. Unpublished MBA project, University of Nairobi.
- Lee, H. L. (2000). Creating value through supply chain integration, *Supply Chain Management Review*, 14 (4), 30-7.
- Lowson, R. H. (2006). How supply network operations strategies evolve: composition, competitive priorities and customization, *International Journal of Physical Distribution & Logistics Management*, 33(1), 75-91.
- Mageto, J. N. (2009). *Relationship between Supply Chain Performance and Supply Chain Responsiveness: A Survey of Supermarkets in Nairobi, Kenya*. Unpublished MBA project,, University of Nairobi.

- Morash, E. A. & Clinton, S. R. (2008). Supply chain integration: customer value through collaborative closeness versus operational excellence. *Journal of Marketing Theory and Practice* 6 (4), 104–120
- Musyimi, R. N. (2012). *Strategies analysis of small scale and medium size manufacturing firms in Kenya*. Unpublished MBA project, University of Nairobi.
- Narasimhan, R. & Kim, S.W. (2002). Effect of supply chain integration on the relationship between diversification and performance: evidence from Japanese and Korean firms, *Journal of Operations Management*, 20 (3), 303-23.
- Odhiambo, W. (1991). *Empirical Analysis of the manufacturing sector in Kenya*. Unpublished MBA project, University of Nairobi.
- Resse, M. (2005). Successful and sustainable business partnerships How to select the right partners. *Industrial Marketing Management*, 1-11.
- Van der Vaart, T. & Van Donk, D.P. (2004). Buyer focus: Evaluation of a new concept for supply chain integration. *International Journal of Production Economics*
- Wanjiru, A. M. (2011). *Use of Warehousing Receipt System by National Cereals and Produce Board as a Strategy to Increase Supply Chain Efficiency*. Unpublished MBA project,, University of Nairobi.

APPENDICES

Appendix I: Introduction Letter

Dear Sir/Madam,

REF: REQUEST TO CARRY OUT DATA COLLECTION.

I am a student at UON pursuing a Master's degree in Business Administration. As a requirement in fulfillment of this degree, am carrying out a study on the "OPTIMIZING SUPPLY CHAIN PERFORMANCE THROUGH BACKWARD AND FORWARD INTEGRATION: A STUDY FOCUSED ON THE KENYA MANUFACTURING SECTOR".

You have been chosen as you are well positioned to provide reliable information that will enable the study achieve its objectives. I intend to research on the above through the use of a questionnaire.

Any assistance accorded to me in my noble cause as well as the information given shall be treated as confidential and will be used purely for the purposes of this research. A final copy of the document shall be availed to you upon request. Your cooperation will be highly appreciated, thank you in anticipation.

Yours Faithfully,

Alphonse Katua

Appendix II: Questionnaire

SECTION A: General Information

1. Indicate the name of your organization (optional).....
2. How long have you worked in this organization?

1- 5 years	[]	11 - 15	[]
6 - 10years	[]	16 years and above	[]
3. What is your highest level of education?

Post Graduate	[]	Diploma	[]
Undergraduate	[]	Certificate	[]

Any other (specify).....
4. Kindly, indicate the department you are working in.

Production	[]	Procurement	[]
Customer service	[]	IT department	[]

Any other (specify).....
5. Indicate position that you hold in the department.

Manager	[]	Unit Head officer	[]
Departmental Head	[]	Supervisor	[]
Assistant Manager	[]	Technical personnel	[]

Other (specify)
6. Does your organization consider supply chain integration to improve its supply chain performance?

Yes	[]	No	[]
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SECTION B: Approaches Adopted by Manufacturing Sector

Information sharing

7. Does your organization embrace information sharing to enhance supply chain integration

Yes [] No []

8. What kind of information is being shared within your organization? Select from the list below

	Yes	No
Technological information		
Marketing information		
Production information		
Inventory information		

9. Kindly indicate your level of agreement on influence of information sharing aspect to supply chain performance? Use a scale of 1-5, where 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree.

	1	2	3	4	5
Improved understanding of market trends and customer needs					
Acquisition of new ideas for products					
Identification of ways of improving production methods					
Reducing total cycle time					
Supplier development processes					
Reducing total logistics costs					
Enhance value to the customer					

Supplier's Participation

10. Are there set programmes or plan to enhance supplier's participation on supply chain integration?

Yes [] No []

11. Kindly indicate the aspect that your organization considers to enhance supplier participation on supply chain performance?

	Yes	No
Supplier selection		
Quality of supplies		
Supplier capabilities		
Supplier evaluation		

12. Indicate your level of agreement with the following statements relating to suppliers relationship and its influence to supply chain performance in your organization? Use a scale of 1-5, where 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree.

	1	2	3	4	5
Supply chain leadership dedicated greater resources to spend more time at suppliers' locations as a result of greater supplier development					
Purchasing plays a key role in fostering relationships and communication to improve quality performance for both the supplying and the buying firm					
Our organization invest more in talent and resources to improve a supplier's performance and activity that requires a long-term commitment by the leadership of the organization					
We review our business processes to identify areas where adopting a greener outlook can actually improve their business					

Organization Coordination

13. Has your organization realized effective organization coordination through supply chain integration?

Yes [] No []

14. Indicate your level of agreement with the following statements relating to organization coordination and its impact to supply chain performance in your organization? Use a scale of 1-5, where 1- strongly disagree, 2- disagree, 3- neutral, 4- agree, 5- strongly agree.

	1	2	3	4	5
Our organization is more effective than competitors in identifying customer needs and focusing resources that are accommodating customer requirements					
We consider external coordination activities as important to improve trust and commitment across the supply chain partners					
Organization coordination promotes the sharing of risks and resources within the supply chain					
Joint system development and shared decision making with suppliers and customers enhances the understanding of management decision					
Supply chain integration coordination reduce development cost and time, and improve profit margins, in product development					
Internal coordination activities increase the understanding of the goals and activities among different functional units, which improves mutual trust and commitment to the organization					
Supply chain integration should always support the attainment of the business goals					

SECTION C: Impact of Supply Chain Integration on Supply Chain Performance

15. To what extent do the following aspect of supply chain performance influenced by the supply chain integration approaches adopted by your organization? Use a scale 1-5 where 1-to a little extent and 5 to a very great extent.

	1	2	3	4	5
Improving customer service level					
Improved product quality					
Operating efficiency					
Gain competitive advantage					
Reduce risks					
Timely delivery of orders					
Efficient utilization of resources					
Improve coordination					
Attainment of strategic goals					

16. What would you recommend to be done to enhance supply chain performance through supply chain integration (backward and forward integration)

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.....

THANK YOU FOR YOUR PARTICIPATION

Appendix III: Sampled Manufacturing Firms in Nairobi

Small firms

1. Brother shirts factory
2. Carbacid (Co2) Ltd
3. Dodhia Packaging Ltd
4. Galaxy Paint (K) Ltd
5. Henkel Kenya Ltd
6. Kenya Wine Agencies
7. Metoxide Africa Ltd
8. Napro Industries Ltd
9. Novelty manufacturers

Medium firms

10. Bluebird Garments Factory
11. C.M.C. Engineering Ltd
12. Impala Glass industries
13. Kappa Oil Refineries Ltd
14. Nairobi Flour Mills Ltd
15. Power techniques Ltd
16. Sadolin Paints
17. Uni plastics Ltd

Large firms

18. B.A.T Kenya Ltd
19. Cooper Motors Corporation (K) Ltd
20. East African Spectre Ltd
21. East African Cables ltd
22. Firestone (E.A) Ltd
23. Haco Industries Ltd
24. Jomo kenyatta Foundation
25. Kenafric Industries Ltd
26. Laboratory and Allied Ltd
27. Mastermind Tobacco
28. Nairobi Bottlers Ltd
29. Tetra Pak Ltd.
30. Coates Brother (EA) Ltd

Source: KAM (2014)