SUPPLY CHAIN INTEGRATION AND PERFORMANCE OF PHARMACEUTICAL FIRMS IN KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted for assessment or award of a degree in any other university.

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DEDICATION

TO

Loise Mukwandiga Metha my mother

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ABBREVIATIONS

SCM	:	Supply Chain Management
MIS	:	Management Information System
ERP	:	Enterprise Resource Planning
CRM	:	Customer Relation Management
PLM	:	Product Lifecycle Management
KAM	:	Kenya Association of Manufacturers
GDP	:	Gross Domestic Product
KBV	:	Knowledge Based View
CFI	:	Cross-functional Integration
POS	:	Point-Of-Sale
TCE	:	Transaction Costs Economics
COMESA	:	Common Market for Eastern and Southern Africa
USD	:	United States Dollars
KEMSA	:	Kenya Medical Supplies Agency
DRC	:	Democratic Republic of Congo
FDA	:	Food and Drug Administration
SPSS	:	Statistical Package for Social Sciences

ABSTRACT

With the fast growing technological developments and intense global competition in the business environment organizations are forced to adopt new strategies of achieving competitive efficiency. Organization's success is now more dependent on operational performance across functional areas of the organization. Successful organizations seem to be those that have embraced integration both internally, with their suppliers and with their customers. Out of the region's estimate of 50 recognized pharmaceutical manufacturers; approximately 30 are based in Kenya.The purpose of this study was to determine the extent of supply chain integration, to establish the impact of supply chain integration on operational performance of pharmaceutical firms in Kenya as well as establishing the constraints of supply chain integration. The target population of this study consisted of all 28 pharmaceutical firms who are registered members of Kenya Association of Manufacturers (KAM) in Kenya. Eighteen (18) out of twenty eight (28) targeted respondents completed the questionnaires making a response rate of 64.2%. The study relied on primary data that was obtained through the use of questionnaires that were directed to the pharmaceutical firms. The study employed descriptive research design. Quantitative data was coded and entered into Statistical Package for Social Science (SPSS Version 17.0) and analyzed using descriptive statistics. The study recommends that pharmaceutical firms should focus on supply chain integration for improved performance in their operations and that they should manage the constraints they experience in the process of integrating so as to integrate extensively. The study established that pharmaceutical firms have embraced supply chain integration and that supply chain integration improved the pharmaceutical firms' operational performance. Through supply chain integration organizations have been able to reduce costs, lead times and inventory levels, improve productivity and products quality and variety thereby leading to customer satisfaction. The study also established that supply chain integration in pharmaceutical firms faced a number of constraints such as restrictive Government policies, financial constraints, Information Technology complexities, cultural gap between supply chain stake holders and bureaucracies in the organizational structure. The study concludes that supply chain integration has a positive impact on supply chain's operational performance.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The source of the commodity in a commodity-type industry is often of no interest to the final customer as long as the commodity adheres to its required specifications and the delivery of that commodity is made by the promised due date. Therefore, supply chain alliances are necessary when delivering the right commodities to customers in order to reduce transportation and inventory costs and improve customer service. In return, cost savings for transportation in the overall supply chain are shared among participating firms. This kind of collaboration with competitors creates a shared solution to common supply chain obstacles and is predicted to be the Next Big Thing (Morton, 2003).

A basic enabler for integration is information sharing, which has been greatly facilitated by the advances in information technology (Yu, Yan & Cheng, 2001). Organizations can harness the power of technology to collaborate with their supply chain partners to work as a single entity. All this can be done with the end objective of having greater understanding of the end consumer behavior and effectively responding to the changes in the market place from a supply chain perspective so that manufacturers make the products only when they are needed and retailers store and sell them to end customers, drastically cutting down on their own inventory levels and associated costs (Mehrotra, 2011). In the long term, supply chain integration will not only improve supply chain responsiveness but will also enhance cash flow and profitability to every link in the supply chain and ultimately contribute to consumer satisfaction.

1.1.1 Supply Chain Integration

Supply chain integration is a close alignment and coordination within a supply chain, often with the use of shared management information systems (MIS). To facilitate coordination between many supply chain partners, supply chain integration is essential. It is a significant feature in achieving seamless integration in a supply chain (Lee & Whang, 2000). Supply chain integration involves not only implementing Enterpise Resource Planning (ERP) systems and ensuring they communicate or interface with legacy systems, but it also involves integrating ERP and Supply Chain

Management (SCM) systems with Customer Relationship Management (CRM), Product Lifecycle Management (PLM), and e-procurement and e-marketplaces, as well as making them available over the Web to foster cooperation and collaboration across the entire value chain.

Integration within an organization includes departments like sales/marketing, purchasing, supply management, logistics, engineering and operations. The affirmative effects of integration within an organization are achieved from side to side cooperation between an organization and its important suppliers and also in the course of supplier development. Hence, supporting the cooperation within departments and the responsibility of supplier development is paramount (Narasimhan & Kim, 2001). Involving suppliers in product development enables firms to make better use of their suppliers' capabilities and technology to deliver competitive products.

1.1.2 Firm Performance

According to Biswas (2000), firm performance measures can be classified broadly into two categories, qualitative measures such as customer satisfaction and product quality and quantitative measures such as order-to-delivery lead time, firm response time, flexibility, resource utilization, delivery performance, etc. The objective of every firm is to maximize the overall value generated. The value an efficient supply chain generates to a firm is the difference between what the final product is worth to the customer and the effort the supply chain expends in filling the customer's request. For most commercial firms, value will be strongly correlated with firm's profitability, the difference between the revenue generated from the customer and the overall cost of delivering the product (Chopra & Meindl, 2004).

A number of studies have examined the linkages between alliances and performance. Johnston et al. (2004) demonstrates gains such as profitability, lead time performance, improved responsiveness, customer loyalty, innovation, quality products, reduction in inventory and improvements in product/process design. The literature on supply chain alliances also provides empirical evidence of their benefits in terms of cycle time and new product development time, delivery performance, flexibility, product availability and customer satisfaction (Stank et al., 2001). It also alludes to the potential of

alliances with regard to reductions in transaction costs and improvements in access to technology and technology transfer.

Thompson et al. (2007), notes that using financial measures alone overlooks the fact that what enables a company to achieve or deliver better financial results from its operations is the achievement of strategic objectives that improve its competitiveness and market strength. Lee and Boss (2002) notes that performance can be measured in numerous ways: sales, profit, productivity, revenue, dividends, growth, stock price, capital, cashflow, return on assets, return on capital, return on equity, return on investment, earnings per share as well as other financial ratios.

According to Richard et al. (2009) organizational performance encompasses three specific areas of firm outcomes, financial performance (profits, return on assets, return on investment, etc.), product market performance (sales, market share, etc.) and shareholder return (total shareholder return, economic value added, etc.). Mahapatro, (2010) defines Organizational Performance as the ability of an organization to fulfill its mission through sound management, strong governance and a persistent dedication to achieving results. The variables used to measure firm's performance should be those that truly capture the essence of organizational performance, either business performance or operational performance. In this study, operational performance variables like inventory levels, lead time, service levels, productivity and operations. All these enhance the firm's profitability which is the main objective of commercial firms.

1.1.3 Supply Chain Integration and Firm Performance

According to Zhao (2002) to understand the impact of supply chain integration, consider traditional supply chain strategies. Supply chains are highly complex systems with multiple production and storage facilities. A typical supply chain is often managed in a decentralized manner, i.e., each stage is managed based on information received from its immediate suppliers and customers (decentralized information) and the objective of the stage is to maximize profit with no, or very little regards, to its impact on other stages in the supply chain (decentralized control). Thus, each stage makes locally optimal decisions based on the orders placed by its customers, and the replenishment lead time provided by its suppliers. Such a

decentralized information and control system faces significant challenges. For example, ordering information flow may be distorted in the sense that the variation of orders tends to increase as one moves up the supply chain, a phenomenon known as Bullwhip effect.

To be competitive, firms need to establish standard managerial strategies which include: being market sensitive (through the capturing and transmission of point-of-sale data), creating virtual supply chains (based on information rather than inventories), process integration (collaboration between buyers and suppliers, joint product development, etc.), and networks (confederations of partners linked together as against stand alone companies), (Gunasekaran, Lai, & Cheng, 2008) and which can only be achieved when there is integration.

1.1.4 Pharmaceutical Firms in Kenya

Kenya is currently the largest producer of pharmaceutical products in the Common Market for Eastern and Southern Africa (COMESA) region, supplying about 50% of the regions' market. Out of the region's estimate of 50 recognized pharmaceutical manufacturers; approximately 30 are based in Kenya. Kenya's pharmaceutical industry is on a rebound, riding on the back of increased expenditure in healthcare and general economic growth over the years. The country's pharmaceutical and consumer health market is estimated to be worth an estimated USD 160 million each year (Kenya Laborum, 2014).

The rapid growth of the pharmaceutical market in the region has presented the need to increase quantity of production, and also increase the export ratio for quality products. Sales of over-the-counter (OTC) and prescription drugs clocked up sales of 17.7 billion Kenyan shillings (USD 234.6 million) in 2008, up 22.9% from Sh14.4 billion the previous year, according to the Kenya Pharmaceutical Country Profile 2010.

According to Olwande (2012) pharmaceutical industry compounds and packages medicines, repacking formulated drugs and processing bulk drugs into doses using predominantly imported active ingredients and excipients. The bulk of locally manufactured preparations are non-sterile, over-the-counter products. The number of companies engaged in manufacturing and distribution of pharmaceutical products in

Kenya continue to expand, driven by the Government's efforts to promote local and foreign investment in the sector.

In Kenya, increased public and private expenditure on healthcare, coupled with increasing levels of medical insurance coverage and continued foreign donor funding, are creating significant opportunities for growth within the Kenyan pharmaceutical and medical devices industries (Frost & Sullivan, 2008). Kenya also enjoys preferential access to the regional market under a number of special access and duty reduction programmes related to the East African Community (EAC) and the COMESA among others. The country exports its medicinal and pharmaceutical products to Tanzania, Uganda, DRC, Rwanda, Burundi, the Comoros, Ethiopia and Malawi among other destinations.

The pharmaceutical sector consists of more than 35 licensed units including local manufacturing companies and large Multi National Corporations (MNCs), subsidiaries or joint ventures. Most are located within Nairobi and its environs. These firms collectively employ over 2,000 people, about 65% of whom work in direct production. According to Kenya Association of Manufacturers (KAM) 2015 directory there are 28 pharmaceutical companies who are registered members.

1.2 Statement of the Problem

Modern supply chains are very complex, with many parallel physical and information flows occurring in order to ensure that products are delivered in the right quantities, to the right place in a cost-effective manner. Supply Chain integration has become possible by the global introduction of long term cooperation and coordination which leads ultimately to the improvement of companies' competitive advantages (Manatsa & McLaren, 2008). Supply chain integration can mitigate deficiencies associated with decentralized control and reduce the "bullwhip effect" (Lofti, Mukhtar, Sahran & Zadeh, 2014). Despite the supply chain integration benefits, many firms are reluctant to cooperate with their supply chain partners due to the challenges involved such as unequal distribution of risks, costs, and benefits among the partners. Some scholars have suggested that the drive towards more efficient supply chains during recent years

has resulted in the supply chains becoming more vulnerable to disruption and prone to challenges (Christopher & Lee, 2004).

Kenya is one of the stable democracies in Africa. It is also the most industrially developed country in East Africa, but it has not yet produced results to match its potential (Kamau, 2011). Kenya's competitive advantage for the health and pharmaceutical sector investment is supported by various investor friendly factors such as trade mark and patent protection, access to regional market, availability of affordable labour and investor friendly arrangements for example Export Processsing Zones (EPZ), Investment Promotion Centre (IPC) and double taxation, bilateral investments and trade agreements among others. For pharmaceutical companies, suppliers, distributors and consumers play a major role on the performance of the companies. Therefore a study on the level at which this sector has embraced the supply chain integration and how it affects organizational oprational performance is important.

According to a study by Zhao (2002) on the impact of information sharing on supply chain performance in a system with information sharing, the manufacturer's forecast is based on the historical data of external customer's demand as well as orders from each retailer. Analytic and computational results revealed that the shorter the transportation lead time and the larger the number of retailers, the higher the impact of information sharing on forecast accuracy. This study however, did not reveal the impact of information sharing on the Firm's performance.

The competitiveness of a supply chain is determined by many different factors and a resource based view of the firm, with attention to networks, knowledge management and environment. These factors are either internal or external to the supply chain, and can be classified as belonging to the following contributors to the functioning of the supply chain: Transportation, Utilities/Equipment, Communication, Suppliers, Customers, Labour and Finance (Stecke & Kumar, 2009). Challenges affect a supply chain by affecting one or more of its components and thus affecting the performance of the firm. Thus there is need to look at how the integration of these contributors to the functioning of the supply chain affects performance of the firm.

Antai (2011) in his study found that although varying theories of competition exist, the competitive environment is constantly changing yet the mainstay of competition which is to compete, remains static. Regardless of the perspective with which competition is looked at, there is a need for competing entities to physically engage in interaction, which is borne out of the need to obtain some sort of resources or service that are generally scarce. The way and manner this interaction occurs and the outcome of such interaction is important, as it can determine how the conceptualization of competition may be advanced.

Asara (2010) carried out a research on information management for competitive advantage within commercial banks in Kenya. He found out that learning opportunities for an organization that already has information advantage may be more valuable than for a competitor having similar opportunities. For an enhanced competitive advantage and growth of pharmaceutical firms therefore, information acquisition, sharing and management which is possible by integrating is vital for valuable learning opportunities that lead to performance improvement of a firm.

According to Kipkorir (2013), in his study on the role of proactive procurement on strategic Procurement performance at public institutions in Kenya, lack of early supplier involvement in the procurement process in an organization impacts negatively, not only on the strategic procurement of the organization, but also on the organization's general performance. Early supplier involvement is a form of vertical integration, where manufacturers involve suppliers at an early stage in the product development/innovation process generally at the level of concept and design. The study did not show how firm's performance is enhanced as a result of collaboration by procuring entity and suppliers.

According to Katua (2014) in his study on the impact of supply chain integration on the supply chain performance in the manufacturing firms in Kenya. He found out that supply chain approaches; information sharing, supplier's participation and organization coordination improved firm's performance. The study however did not look at the impact of each different type of supply chain integration; forward

integration (supplier integration) cross-functional integration (internal integration) and backward integration (customer integration) on firm's performance.

From the studies above, it's evident that supply chain members should integrate with other supply chain members for efficient and effective organizational performance. This study therefore, sought to answer the following three questions; what is the extent of supply chain integration in pharmaceutical firms in Kenya? What is the impact of supply chain integration on pharmaceutical firms' operational performance in Kenya? What are the challenges of supply chain integration in pharmaceutical firms in Kenya?

1.3 Research Objectives

The study was guided by the following objectives:

i) To determine the extent of supply chain integration in pharmaceutical firms in Kenya.

ii) To establish the impact of supply chain integration on pharmaceutical firms' operational performance in Kenya.

iii) To establish the constraints of supply chain integration in pharmaceutical firms in Kenya.

1.4 Value of the Study

The regulator and policy makers may use this study to understand the challenges affecting supply chain integration in pharmaceutical firms and may be in a better position to assist them overcome the challenges of supply chain integration by developing appropriate policies or any other way possible.

The study will satisfy the needs of the supply chain members in the pharmaceutical industry. There will be a reduction of costs and efficiency in operations of the whole chain on integration. There will be optimal ordering decisions for suppliers and consumers. Consumers will be at a position to get products at the right price, right quality and right time as a result of reduction in the cost of production, improvement of the quality of products and reduced lead times. Pharmaceutical firms' decisions and actions in their operations will be based on concrete knowledge acquired from other

supply chain members. Real time information will assist them in making informed timely decisions to the benefit of the firm's performance.

The study will also contribute to the existing literature in the field of supply chain integration. It will form the basis for further research in the area of the impact of supply chain integration on firm's performance which in turn can be used to trigger subsequent studies in the sub areas of the same topic.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the available literature on supply chain integration. It includes the theoretical foundation of the study, types of supply chain integration, the pharmaceutical industry around the world, effects of supply chain integration and the constraints of supply chain integration.

2.2 Theoretical Foundation

Many theories have been developed to explain Supply Chain Integration. These theories and perspectives have emerged to explain why closer ties with trading partners provide strategic benefits that outweigh risks (Barringer & Harrisson, 2000)

2.2.1 The Knowledge Based View

The knowledge based view (KBV) of the firm suggests that collaboration provides access to strategic knowledge (Grant & Baden-Fuller, 2004), and that firm performance is directly linked to building capabilities through interacting with heterogeneous sources of knowledge (Kogut, 2000). This view defines knowledge as the resource with the highest strategic value that can be generated, acquired and applied within and between firms. This perspective builds on the RBV by suggesting that knowledge promotes competitive advantage because knowledge resources have characteristics consistent with either; developing capabilities that are rare, valuable, imperfectly imitable and non-substitutable, or being of themselves largely intangible resources consistent with possessing these characteristics.

The KBV of the firm also supports the building of competencies through improving absorptive capacity. As firms' employees are involved in accessing knowledge through boundary spanning activities, recent empirical studies have shown the capacity for organizational learning is increased (Teigland & Wasko, 2003). From a KBV perspective, collaboration between trading partners represents on one level a factor minimizing the cost and time for effective transfer of knowledge between

firms, and at a deeper level a potential significant source of value. As such, the value of knowledge as a strategic resource enabling more effective management of the supply chain has been recognized (Hult et al., 2006). The KBV perspective provides support for the proposition that collaboration is an effective strategy for accessing knowledge distributed amongst trading partners. Access to diverse sources of knowledge, therefore, promotes growth of the knowledge base for the firm and builds competitive advantage (Kogut, 2000).

2.2.2 The Systems View

The systems view of the supply chain promotes the importance of integration between the firm, avenues of supply, and channels of distribution. Management of the supply chain as a system rather than many individual parts promotes the sharing of information between organizations, recognizing areas of common interest and combined competitive advantage (Vereecke & Muylle, 2006). This approach, rather than focusing on the risks associated with opportunism, takes the opposite view that closer collaboration with trading partners represents an opportunity.

According to Awad and Nassar (2010) SCM system facilitates inter-enterprise cooperation and collaboration with suppliers, customers, and business partners. Although this system can bring benefits and competitive advantage to organizations, the management and implementation of this system pose significant challenges to organizations. In traditional supply chain integration, the definitions of parts are usually limited by the boundary of the enterprises: the integration emphasizes connecting each enterprise with logistics and information communications.

2.2.3 Transaction Cost Economics View

Transaction cost economics (TCE) view is based in the concept of bounded rationality, or the cognitive limits that constrain managers when choosing trading partners whom they can trust. This leads to the assumption that all relations with trading partners are subject to the risk of opportunistic behaviour, or being deceptive and dishonest in the service of your own interests, particularly if the interests of parties are also assumed not to be aligned. In fact, this approach to supplier relationships is still widely endorsed as acceptable practice (Kaufman et al., 2000).

The rationale for this strategy has been to counteract the possibility of opportunistic behaviour of trading or to neutralize bargaining power of suppliers and/or customers.

According to TCE, the existence of transaction costs and the ability of entrepreneurs to minimize them when governing certain transactions explain the existence of firms within free market economies. Firms are viewed as efficient alternatives to market coordination for the government of some transactions. Furthermore, as the firm and the entrepreneur gain advantages in governing additional transactions, firms will grow and incorporate additional activity. The limits of the firm will be established by the relative ability of markets and firms to coordinate transactions (Jones, 2010).

2.2.4 The Game Theory Approach

In a game theory approach Supply chain enterprises share a common goal: to hold a share in a market. They join their resources to produce and sell particular goods. Their main factor of integration is the production process for these goods but they have different constraints and, beyond their common goal, their objectives may be conflicting and even antagonistic. Cooperative game theory can be of great help to design a supply chain by selecting an optimal coalition of partners. But a non-cooperative game theory (also called strategic game theory) approach is certainly more appropriate to determine the set of equilibrium points that can be reached in trade conditions. A case of particular interest is when there exist decisional states from which neither player has interest to depart (Hennet & Arda ,2008).

A game must specify the players of the game, the information and actions available to each player at each decision point, and the payoffs for each outcome. A game theorist typically uses these elements, along with a solution concept of their choosing, to deduce a set of equilibrium strategies for each player such that, when these strategies are employed, no player can profit by unilaterally deviating from their strategy. These equilibrium strategies determine an equilibrium to the game, a stable state in which either one outcome occurs or a set of outcomes occur with known probability (Rasmusen, 2007).

2.3 Types of Supply Chain Integration

There are three types of supply chain integration i.e. Supplier Integration, Internal Integration and Customer Integration.

2.3.1 Supplier Integration

The general definition of supplier integration (downward integration) is synonymous with the involvement of suppliers into the productive procedure of another company (Holweg *et al.*, 2005). According to Yao *et al.* (2007), supplier integration has to do with data flow between two or more companies and constitutes a way towards achieving process integration, under which the supplier actually takes control over the inventory and purchasing functions of the buyer.

Petersen *et al.* (2005), observes that the integration of material suppliers into the new product development cycle can provide substantial benefits towards cutting concept to customer development time, improving quality, reducing the cost of new products and facilitating the smooth launch of new products. This involvement may range from simple consultation with suppliers on design ideas to making suppliers fully responsible for the design of components or systems they will supply. Early supplier involvement is a key coordinating process in supply chain design, product design and process design.

2.3.2 Internal Integration

Internal integration means concurrent engineering, new product development, cross - functional integration (CFI), or simply another type of collaboration and/ or cooperation within a firm. As such, internal integration would mean some sort of micro-chain in a supply chain that is located within one of the units (companies) of the overall chain. Adoption of internal integration therefore, improves lead times, reduces the probability of stock-outs, reduces costs, and thus makes a firm (and the supply chain in which it operates) more competitive (Tiovo, 2009).

According to qualitative data gathered by Fawcett and Magnan (2002), supply chain managers believe that internal (crossfunctional) integration is at the crux of all supply

chain initiatives. Internal integration is a first step towards achieving supply chain integration.

2.3.3 Customer Integration

Customer satisfaction is considered to be the main driver for business success in the new economy and thus keeping customers satisfied would ensure the economic success of the organisation. Customer Relational Management (CRM), collaboration in the flow of products (demand planning and replenishment) and shared distribution systems are three of the most popular management systems that have been proposed for dealing with the practical issues of customer collaboration (Singh & Power, 2009).

Putting in place formal systems that aim to increase customer satisfaction, always being aware of customer requirements and specifications, having a systematic way to constantly measure customer satisfaction and locate areas of further improvement, paying attention to customer feedback and incorporate suggestions into processes, products and services and lastly always being ready to handle complaints and gain from the problem solving procedure are the drivers recognised by the literature for successfully integrating customers into the chain and, thus, obtaining corresponding benefits. Gruner and Homburg (2000) in their study showed that customer integration in the early stages is important for the success of the new product. Integration in the later stages was also leading to higher performance.

2.4 The Pharmaceutical Industry around the World

Prior to the 20th century, drugs were generally produced by small scale manufacturers with little regulatory control over manufacturing or claims of safety and efficacy. To the extent that such laws did exist, enforcement was lax. In the past, most drugs have been discovered either by isolating the active ingredient from traditional remedies or by serendipitous discovery. Drug discovery and development is very expensive; of all compounds investigated for use in humans only a small fraction are eventually approved in most nations by government appointed medical institutions or boards, who have to approve new drugs before they can be marketed in those countries. Industry wide research and investment reached a record USD 65.3 billion in 2009.While the cost of research in the United States was about USD 34.2 billion

between 1995 and 2010, revenues rose by USD 200.4 billion in that time (Perry, 2012).

A study by the consulting firm Bain and Company reported that the cost for discovering, developing and launching a new drug, which factored in marketing and other business expenses along with the prospective drugs that fail, rose over a five year period to nearly USD 1.7 billion in 2003. According to Forbes, by 2010 development costs were between USD 4 billion to USD 11 billion per drug. Due to repeated accusations and findings that some clinical trials conducted or funded by pharmaceutical companies may report only positive results for the preferred medication, the industry has been looked at much more closely by independent groups and government agencies (Moynihan, 2003). Excessive regulation suppresses therapeutic innovation, and that the current cost of regulator required clinical trials prevents the full exploitation of new genetic and biological knowledge for the treatment of human disease.

For the first time ever, in 2011, global spending on prescription drugs topped USD 954 billion, even as growth slowed somewhat in Europe and North America. The United States accounts for more than a third of the global pharmaceutical market, with USD 340 billion in annual sales followed by the European Union and Japan. Emerging markets such as China, Russia, South Korea and Mexico outpaced that market, growing a huge 81 percent (Matthew & Peter, 2006).

2.5 Supply Chain Integration and Firm Performance

Common themes covering supply chain integration include cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes, to managing integrated chains of processes (Droge et al., 2004). Integration of information technologies through development of standards and connection of legacy systems has also been identified as an important driver of potential performance improvements (Kulp et al., 2004). An emergent theme has been to redefine the supply chain as a demand chain to reflect the importance of customer focus and to highlight the importance of end-to-end coordination between supply and demand (Williams et al., 2002). This has led to the examination of integration between trading partners from a

more holistic perspective with the emphasis being on trying to determine the nature, importance and influence of integration across multiple tiers of the chain (Frohlich & Westbrook, 2002; Heikkila, 2002; Rosenzweig et al., 2003).

The findings of the above studies vary, but some unifying themes emerge including: in rapidly growing industries trading partners can achieve efficiency and higher levels of customer satisfaction through a positive feedback loop between collaboration, information flows and the positive impact this has on the relationship (Heikkila, 2002); high levels of integration intensity lead to the embedding of capabilities in organizational processes creating conditions conducive to the development of competitive advantage (Rosenzweig et al., 2003); integration using web-based technologies is most effective for manufacturers when it includes linking technologies with both suppliers and customers concurrently (Frohlich & Westbrook, 2002); the wider the span and degree of integration activity across the supply chain (i.e., for a manufacturer the extent to which the integration with trading partners extends both upstream and downstream in the supply chain), the stronger is the link to performance improvement. Implied in these results is the recognition of the systemic nature of supply chains.

Abushaikha 2014 suggests that supply chain integration is achieved through integration at the three levels; supplier, internal and customer levels. The retailers share with the suppliers Point-Of-Sales (POS), inventory levels and forecast data, as well as information on promotional events. With the visibility of current demand and inventory levels, suppliers can better forecast and schedule their production and inventory activities, and provide better service to their customers.

2.6 Constraints of Supply Chain Integration

Supply chain integration faces various constraints. Managerial constraints in supply chain integration arise because the managers dealing with supply chain management do not realize the real benefits of integration and do not have confidence in integration system (Marsh & Flanagan, 2000). These senior executives do not wish to invest in innovation and culture, conducive to integration. Curry and Moore (2006) have suggested that in order to achieve information sharing culture, support of top management is required.

Organizational constraints are due to the organizational structure and the groups involved in the supply chain integration process. The process of supply chain integration may become complicated because of these constraints. The organizations with high level of bureaucracy and strict administrative control lack the supply chain integration spirit (Bures, 2003).

Financial constraint is the prime challenge in support of the infrastructure and man-power requirements of supply chain integration system. Information and technological systems require more funds. Large amount of financial resources are needed for redesigning internal organizational and technical processes, changing traditional and fundamental product distribution channels, customer service procedures and training of staff to achieve efficient supply chain integration (Motwani *et al.*, 2000).

Technological linkages across organizational units as well as up and down the supply chain are particularly critical to supply chain integration. Complexity of a technology is a major factor that affects the adoption of supply chain integration. Different organizations may use various types of hardware, software, data standards and definitions, as well as programming languages and the task of integrating them could be very challenging. Hoffman and Mehra (2000) stated that the technological factors can cause the failure of any information system in supply chain, so technological barriers need to be tackled at the earliest.

Individual challenges in supply chain integration originate from behavior and actions of either individuals or groups within or between various business functions. Information is scattered among individuals and across groups or among group members. The information that other chain members might need may be available with any of individual or group in the chain. Organizations' effort to encourage and facilitate the sharing of information by investing in collaborative information and communication technology becomes useless if employees are not willing to share the information. Individuals feel that power, ownership and privilege of possessing crucial information are lost when they share the information (Kolekofski and Heminger, 2003).

One of the major constraints of integration is the failure to recognize the cultural gap between different stakeholders within an organization. Working methods, techniques

and corporate culture may vary from organization to organization and this may become a constraint in supply chain integration. The information culture within an organization must be conducive to information management. This means a culture that secures the support, enthusiasm and co-operation of staff and management alike (Curry and Moore, 2006).

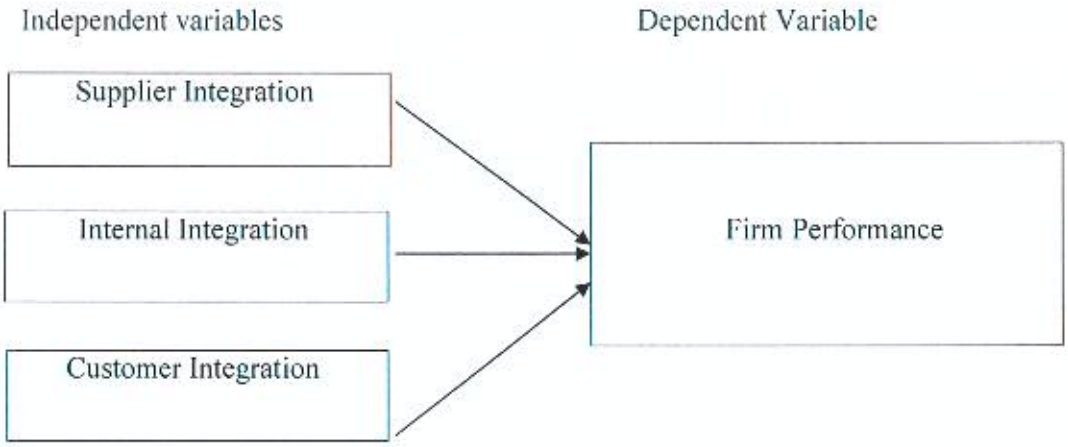
The psychological constraints around collaboration are real and imperative. Sometimes there is a real and justified fear that collaboration across the corporate boundaries can turn into a competitive disadvantage. By formulating effective business policies, agreements and business plans that an enterprise can use to establish guidelines and rules for collaboration with supply chain partners can help assuage these constraints. This will ultimately help mitigate the fear of integration and improve efficiency and create new opportunities for all stakeholders (Sahin and Robinson, 2002).

2.7 Summary of Literature Review and Conceptual Model

From the review of past studies above, supply chain integration requires coordination of all different activities of the supply chain. Successful supply chain integration enables goods to move smoothly and on time from suppliers to manufacturers and to customers, which enables a firm to keep inventories low and cost down. Business partners must learn to trust each other. To control the uncertainties, it is necessary to identify and understand their causes, determine how uncertainties in some activities will affect other activities up and down the supply chain and formulate a specific way to reduce or eliminate uncertainties in a supply chain (Turban, 2004). In the manufacturing firms, the financial strategies should be regularly improved as financial constraint is the main challenge to supply chain integration. Technological constraints mainly depend upon the funding approved by the firm's management for integration. Constraints with the highest driving power as well as those with the highest dependence power should require high management skills from the top management in order to attack on them. Therefore, it is of great importance to find out the extent and the impact of integration on operaional performance in pharmaceutical firms in Kenya as well as the constraints facing the same as presented in Figure 2.1.

Figure 2.1 Conceptual Model

Conceptual model



Source: Author (2015)

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research methodology that was adopted by the study. It looks at the research design, target population, data collection technique and data analysis technique.

3.2 Research Design

A descriptive research design of a cross sectional type was used in this research. A cross sectional survey is carried out at one point in time for same variable across all respondents. This enables the researcher to generalize the findings. According to Mugenda and Mugenda (2003) a survey occurs when data is collected from many or several study units.

3.3 Target Population

The target population in this study was pharmaceutical firms in Kenya that are members of KAM. The main reason for this choice was that these firms are likely to exhibit an elaborate SCM philosophy and make use of supply chain integration. As per 2015 Kenya Manufacturers and Exporters Directory, there were 28 Pharmaceutical companies who are its members in Kenya (Appendix II).

The study was a census survey as all the Pharmaceutical companies who are KAM members in Kenya were studied. A census allows the data gathered to be more representative and easy to generalize and overcomes the biases that arise if a sample is used.

3.4 Data Collection

Primary data was collected using pre-designed questionnaires administered by drop and pick technique and by email to respondents and then collected later. The respondents were those involved in integration within and out of the organization in the aim of enhancing the firm's performance, specifically managers in the following departments; information technology, research and development, marketing, or their equivalent. The questionnaire was in the form of Likert scale where respondents were required to indicate their views on a scale of 1 to 5. The questionnaire contained

relatively structured questions in four sections: Section A covered general information, Section B covered the extent of supply chain integration, Section C covered the impact of supply chain integration on firm's operational performance and Section D covered the constraints of supply chain integration. This was an efficient data collection technique since the right questions that were to assist in the study were asked and each respondent was asked to respond to the same set of questions, thus being an efficient way of collecting responses from a large population.

3.5 Data Analysis

Both descriptive and inferential statistics were used to analyze the primary data gathered in order to meet the objectives of the study. Descriptive statistics was used because it helps in simplifying large amount of data in a sensible way. Each descriptive statistic reduces lots of data into a simpler summary. Inferential statistics was used to make an inference about the population based on results that were obtained from the survey.

The extent of supply chain integration was determined based on the frequencies and percentages of different types of integration. The constraints of integration in pharmaceutical firms were established from percentages, tables and pie charts generated from the data gathered. The impact of supply chain integration on firm's operational performance was derived by use of multiple regression analysis. The below multiple regression formula was used.

$Y= \beta 0+\beta 1x1+\beta 2x2+\beta 3x3+Et$

Where:

β0 is the regression coefficient/constant/Y-intercept

β1, **β2** and **β3** are the slopes of the regression equation

Y is Firm Performance (Dependent Variable)

X1 is Supplier Integration (Independent Variable)

X2 is Internal Integration (Independent Variable)

X1 is Customer Integration (Independent Variable)

Et is Error Term

Table 3.1 shows a summary of data collection and analysis.

Table 3.1 Summary of how data was collected and analyzed

Objective	Questionnaire section	Data analysis method
General Information	Section A	Descriptive Statistics
Extent of supply chain integration	Section B	Descriptive Statistics
Impact of supply chain integration on firm's operational performance	Section C	Inferential Statistics (multiple regression analysis)
Constraints of supply chain integration	Section D	Descriptive Statistics

Source: Author (2015)

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND INTERPRETATION

4.1 Introduction

The chapter presents data analysis, findings and discussion of the study in line with the research objectives. The research objectives of the study were to determine the extent of supply chain integration in pharmaceutical firms, to establish the impact of supply chain integration on pharmaceutical firm's operational performance and to establish the constraints of supply chain integration in pharmaceutical firms in Kenya.

4.2 Response Rate

A total of 28 questionnaires were issued out. 18 out of 28 targeted respondents filled in and returned the questionnaire contributing to 64% response rate. This response rate was good and representative and conforms to Mugenda and Mugenda (1999) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. Table 4.1 shows the response rate.

Table 4.1: Response Rate

Response Rate	Frequency	Percentage
Responded	18	64
Not responded	10	36
Total	**28**	**100**

Source: Research Findings (2015)

4.3 Year of Establishment

Table 4.2 shows the year of establishment of the targeted firms.

Table 4.2 Year of Establishment

Year	Frequency	Percent
Before 1960	2	11.1
1971-1980	2	11.1
1981-1990	1	5.6
1991-2000	4	22.2
2001-2010	9	50
2011-2015	0	0
Total	**18**	**100.0**

Source: Research Findings (2015)

The findings in Table 4.2 show that 50% of the pharmaceutical firms were established from 2001 to 2010, 22.2% were established from 1991 to 2000, 11.1% were established from 1971 to 1980 and the same percentage were established before 1960 while the remaining 5.6% were established from 1981 to 1990. This implies that most of the organizations studied were established more than 20 years ago and are likely to exhibit an elaborate SCM philosophy and make use of supply chain integration.

4.4 Position of the Respondent

The study sought to establish the position of the respondent. Table 4.3 shows the position of the respondents.

Table 4.3 Position of the Respondent

Position	Frequency	Percent
Supply chain officer	20	71.4
Marketing manager	5	17.9
Other staff	3	10.7
Total	**28**	**100.0**

Source: Research Findings (2015)

Results in Table 4.3 show that 71.4% were supply chain officers, 17.9% were marketing managers while the remaining 10.7% were other staff. Majority of the respondents were staff involved in the supply chain and staff from the marketing department who were more informed on the issues of supply chain integration and performance making the study more credible.

4.5 Respondent's Gender

The study sought to establish the respondent's gender. Table 4.4 shows the respondent's gender.

Table 4.4: Respondent's Gender

Respondents gender	Frequency	Percentage
Male	13	72.2
Female	5	27.8
Total	**18**	**100**

Source: Research Findings (2015)

Results in Table 4.4 show that 72.2% of the respondents were male and 27.8% of the respondents were female. This implies that the majority of the respondents were male but there were female respondents also making the study unbiased since all the genders were represented.

4.6 Respondent's Age Bracket

The study established the age bracket of the respondent's. Table 4.5 shows the respondent's age bracket.

Table 4.5 Respondent's Age

Years	Frequency	Percent
Less than 30	9	50.0
31 - 40	7	38.9
41 - 50	2	11.1
Total	**18**	**100.0**

Source: Research Findings (2015)

Results in Table 4.5 show that 50% of the respondents were less than 30 years old, 38.9% were aged between 31 to 40 years while the remaining 11.1% were aged between 41 to 50 years. This shows that all the respondents were of the required working age making the findings reliable.

4.7 Respondent's Years of Service

The study established the years of service of the respondent's. Table 4.6 shows the respondent's years of service.

Table 4.6 Respondent's Years of Service

Years	Frequency	Percent
Less than 5	6	33.3
6 - 10	5	27.8
11 – 15	3	16.7
16 – 20	3	16.7
Over 20	1	5.5
Total	**18**	**100.0**

Source: Research Findings (2015)

Results in Table 4.6 show that 33.3% of the respondents had less than 5 years of service, 27.8% had between 6 to 10 years of service, 16.7% had between 11 to 15 and 16 to 20 years of service each while the remaining 5.5% had over 20 years of service. From the findings, it is clear that the majority of the respondents had adequate experience that is required to enhance supply chain integration.

4.8 The Extent of Supply Chain Integration

The study sought to determine the extent to which the pharmaceutical firms have embraced supply chain integration. Table 4.7 shows the extent of supplier integration in the targeted pharmaceutical firms.

Table 4.7 Extent of Supplier Integration

	Frequency	**Percentage**
A very large extent	1	5.55
A large extent	12	66.67
A moderate extent	2	11.11
A small extent	3	16.67
A very small extent	0	0
Total	**18**	**100**

Source: Research Findings (2015)

Results in Table 4.7 show that 66.67% of the firms involved in the study had embraced supplier integration to a large extent, 16.67% to a small extent 11.11% to a moderate extent while the remaining 5.55% had embraced supplier integration to a very large extent. The findings show that the majority of the organizations had embraced supplier integration. Morash and Clinton (2008) pointed that supply chain integration is recognized as a strategy for improving performance in highly competitive environments.

Table 4.8 shows the extent of internal integration in the targeted pharmaceutical firms.

Table 4.8 Extent of Internal Integration

	Frequency	Percentage
A very large extent	1	5.55
A large extent	11	61.11
A moderate extent	2	11.11
A small extent	3	16.67
A very small extent	1	5.55
Total	**18**	**100**

Source: Research Findings (2015)

Results in Table 4.8 show that 61.11% of the firms involved in the study had embraced internal integration to a large extent, 16.67% to a small extent 11.11% to a moderate extent and 5.55% had embraced supplier integration to a very large extent as well as a very small extent.

From the findings majority of the organizations studied had embraced internal integration in their organization. According to qualitative data gathered by Fawcett and Magnan (2002), supply chain managers believe that internal (crossfunctional) integration is at the crux of all supply chain initiatives. Internal integration is a first step towards achieving supply chain integration.

Table 4.7 shows the extent of customer integration in the targeted pharmaceutical firms.

Table 4.9 Extent of Customer Integration

	Frequency	Percentage
A very large extent	0	0
A large extent	11	61.11
A moderate extent	2	11.11
A small extent	5	27.78
A very small extent	0	0
Total	**18**	**100**

Source: Research Findings (2015)

Results in Table 4.9 show that 61.11% of the firms involved in the study had embraced customer integration to a large extent, 27.78% to a small extent while the remaining 11.11% had embraced supplier integration to a moderate extent. From the findings it was clear that the majority of the organizations had embraced customer integration. The study conforms with Awad and Nassar (2010) on the systems view, SCM system facilitates inter-enterprise cooperation and collaboration with suppliers, customers, and business partners. Implied in these results is the recognition of the systemic nature of supply chains.

4.9 Inferential Analysis

To establish the impact of supply chain supplier integration, internal integration and customer integration (independent variables) on operational firm performance in pharmaceutical firms in Kenya (dependent variable), the study conducted inferential analysis which involved coefficient of correlation, coefficient of determination and multiple regression analysis. The study used the statistical package for social sciences (SPSS) to get the multiple regression analysis for the study.

4.9.1 Karl Pearson's Correlation Analysis

The study used Karl Pearson's coefficient of correlation (r) to show the relationship between the study variables and the findings of the study. From the findings, it was clear that there was a strong positive correlation between supplier integration and operational performance as indicated by the correlation value of 0.052, a very strong positive relationship between internal integration and operational performance with a correlation value of 0.714 and a strong positive relationship between customer integration and operational performance with a correlation figure of 0.521. This shows that there is a positive correlation between supply chain integration and pharmaceutical firms' operational performance.

Table 4.10 Coefficient of Correlation

		Operational Performance	Supplier Integration	Internal Integration	Customer Integration
Operational Performance	**Pearson Correlation**	1			
	Sig. (2-Tailed)				
Supplier Integration	**Pearson Correlation**	.0520	1		
	Sig. (2-Tailed)	.0032			
Internal Integration	**Pearson Correlation**	.7140	.3341	1	
	Sig. (2-Tailed)	.0021	.0014		
Customer Integration	**Pearson Correlation**	.5210	.3610	.0000	1
	Sig. (2-Tailed)	.0026	.0034	1.000	

Source, Researcher, (2015)

4.9.2 Coefficient of Determination

From the findings 96.3% of the operational performance of Pharmaceutical firms is attributed to the three types of integration i.e. Supplier integration, Internal integration

and Customer integration. The other 3.7% of the operational performance is attributed to other factors not investigated in this study.

Table 4.11 Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std, Error of the Estimate
1	0.981 (a)	0.963	0.691	0.752

Source, Researcher, (2015)

4.9.3 Multiple Regression Analysis

The study conducted multiple regression analysis so as to establish the impact of supply chain integration on operational firm performance in pharmaceutical firms in Kenya. The regression equation ($Y= \beta 0+\beta 1x1+\beta 2x2+\beta 3x3+Et$) was used.

$Y=1.425+0.245X1+0.349X2+0.214X3+0$

Where:

Y = Firm Performance (Dependent Variable)

X1 = Supplier Integration (Independent Variable)

X2 = Internal Integration (Independent Variable)

X3 = Customer Integration (Independent Variable)

According to the regression equation established, taking all factors (supplier integration, internal integration and customer integration) constant at zero, supply chain operational performance in pharmaceutical firms will be 1.425. A unit increase in Supplier integration will lead to 0.245 increase in effective operational performance in pharmaceutical firms. A unit increase in internal integration will lead to a 0.349 increase in operational performance in pharmaceutical firms while a unit increase in customer integration will lead to a 0.214 increase in operational performance in pharmaceutical firms. This therefore implies that all the three variables have a positive relationship with internal integration contributing more to pharmaceutical

firm's operational performance while customer integration contributes the least to pharmaceutical firm's operational performance.

The study findings conform with (Rosenzweig et al, 2003) in that high levels of integration intensity lead to the embedding of capabilities in organizational processes creating conditions conducive to the development of competitive advantage. The wider the span and degree of integration activity across the supply chain, the stronger is the link to performance.

Table 4.12 Multiple Regression Analysis

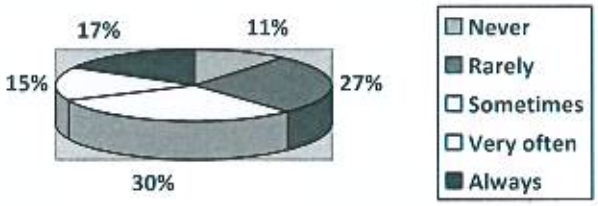
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.425	1.069		1.738	0.032
Supplier Integration	0.547	0.204	0.136	0.618	0.015
Internal Integration	0.518	0.194	0.09	0.357	0.023
Customer Integration	0.503	0.17	0.347	1.283	0.043

Source, Researcher, (2015)

4.10 Constraints Facing Supply Chain Integration

The study sought to establish the constraints of supply chain integration in pharmaceutical firms. Figure 4.3 shows the frequency of supply chain integration constraints to the targeted pharmaceutical firms.

Figure 4.3 Frequency of Supply Chain Integration Constraints



Source: Research Findings (2015)

The findings show that 30% of the firms involved in the study experienced some of the supply chain integration constraints sometimes, 27% rarely experienced some of the supply chain integration constraints, 17% always experienced some of the supply chain integration constraints, 15% experienced some of the supply chain integration constraints very often while the remaining 11% never experienced some of the supply chain integration constraints.

The study findings conform to the past studies in the literature review that supply chain integration faces various constraints. Coordination of all different activities of the supply chain is therefore required to control the uncertainties, which affect activities up and down the supply chain.

Table 4.13 shows the constraints facing supply chain integration in the targeted pharmaceutical firms.

Table 4.13 Supply Chain Integration Constraints

	Never	Rarely	Sometimes	Very often	Always	
Information Technology Complexity	11.11	16.67	33.33	16.67	22.22	**100**
Financial Constraints	0	0	11.11	55.56	33.33	**100**
Lack of top management's support	16.67	50.00	27.78	5.55	0.00	**100**
Unwillingness of Employees to share information	22.22	66.67	11.11	0.00	0.00	**100**
Restrictive Government polices	0.00	0.00	5.55	16.67	77.78	**100**
Cultural gap between supply chain stake holders	11.11	22.22	61.11	5.55	0.00	**100**
Fear of integrating	16.67	50.00	33.33	0.00	0.00	**100**
Bureaucracy in the organizational structure	11.11	11.11	55.56	22.22	0.00	**100**

Source: Research Findings (2015)

Results in Table 4.13 indicate that restrictive Government policies was the greatest constraint facing supply chain integration followed by the financial constraint then the cultural gap between supply chain stake holders, bureaucracy in the organizational structure and Information complexities respectively.

The study conforms to Motwani *et al*, (2000) that financial constraint is a major challenge in supply chain integration because large amount of financial resources are needed for redesigning internal organizational and technical processes, changing traditional and fundamental product distribution channels, customer service procedures and training of staff to achieve efficient supply chain integration.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents summary, conclusion and policy recommendations in line with the research objectives. The research objectives of the study were to determine the extent of supply chain integration in pharmaceutical firms, to establish the impact of supply chain integration on pharmaceutical firms' operational performance and to establish the constraints of supply chain integration in pharmaceutical firms in Kenya. The chapter also presents the limitations of the study and suggested areas for further studies.

5.2 Summary

The study focus was to determine the extent of supply chain integration in pharmaceutical firms, to establish the impact of supply chain integration on pharmaceutical firms' operational performance and to establish the constraints of supply chain integration in pharmaceutical firms in Kenya.

From the study findings it was clear that pharmaceutical firms have embraced all three types of supply chain integrations in their organizations i.e. supplier integration, internal integration and customer integration. On supplier integration, the study found that many organizations have long term relationships with their suppliers, whom they consult and seek quality assurance from as well as providing them with information through the information systems so that they can improve on their quality and responsiveness. Quick ordering systems and stable procurement through supplier networks with suppliers have been established and there is participation of suppliers in the procurement and production processes. The study also found that the gains resulting from supplier integration are shared between the pharmaceutical firms and their suppliers.

On internal integration, the study found that the information is shared within the organizations, there are periodic interdepartmental meetings and there is cooperation within the marketing department. The study further found that there is data integration

among internal functions which is achieved through the use of information technology systems and integrative inventory management systems have been implemented.

On customer integration the study found that the information is shared to customers through the use of information systems and the feedback provided by customers is used to improve customer relations, processes, products and services. The study also found that there is computerization of customers ordering which has been embraced to a large extent and that customers contribute to the development of the organizational values.

On the impact of supply chain integration on pharmaceutical firm's operational performance, the study found that supplier integration has improved the procurement process and reduced the supplier's delivery lead time. Through supplier integration the pharmaceutical firms have been able to reduce the materials total cost and acquire an improved quality and variety of materials. Internal integration has led to the firm's reduction in the average manufacturing cost as well as the manufacturing lead time. Further, the study found out that the levels of inventory have been reduced to a large extent and the direct labour productivity has increased. Internal integration has led to improved product quality and variety, increase in the speed and numbers of product development and on-time delivery of products to customers. This has led to improvement of customer service and customer satisfaction.

On the constraints facing pharmaceutical firms, the study found that the firms are sometimes constrained in their operations. Restrictive Government policies were found to be the constraint that always affects the pharmaceutical firms. Financial constraint was found to very often constrain the pharmaceutical firm's operations with information technology complexity, cultural gap between supply chain stake holders and bureaucracy in the organizational structure sometimes constraining the firms operations and performance. Other constraints experienced by the firms were the Customs Department failing to release their goods in time thus increasing demurrages/storage charges and consequently increasing the Bank Interest Charges and the Manufacturing/Delivery lead times.

5.3 Conclusion

Based on the findings in relation to the objectives, the study concluded that pharmaceutical firms have embraced supply chain integration; supplier integration such as having long term relationships with their suppliers, internal integration such as cross-functional integration and customer integration by sharing information with their customers and encouraging their feedback.

On the impact of supply chain integration, the study established that supply chain integration improved the pharmaceutical firms' operational performance. Through supply chain integration organizations have been able to reduce costs, lead times and inventory levels, improve productivity and products quality and variety thereby leading to customer satisfaction.

The study also established that supply chain integration in pharmaceutical firms faced a number of constraints such as restrictive Government policies, financial constraints, Information Technology complexities, cultural gap between supply chain stake holders and bureaucracies in the organizational structure.

5.4 Recommendations for Policy and Practice

The study confined itself to pharmaceutical firms in Kenya who are registered members of Kenya Association of Manufacturers (KAM). This research should be replicated in other pharmaceutical firms in Kenya as well as other manufacturing firms in various sectors.

Furthermore the study recommends that pharmaceutical firms should focus on supply chain integration for improved performance in their operations. The success of the firms will depend on a firm's ability to integrate with suppliers and customers as well as internally allowing information sharing and consequently improving operational performance.

Finally, the study recommends that in order to extensively integrate, pharmaceutical firms should manage the constraints they experience in the process of integrating. This will involve voicing their concerns on restrictive Government policies to the relevant bodies, budgeting and measuring performance which is necessary for

effective operation and control to manage the finances and sensitizing supply chain stake holders on the importance of integration.

5.5 Limitations of the Study

The researcher encountered a number of challenges especially during data collection. The researcher encountered some respondents who were not willing to co-operate. Some did not complete the questionnaire promptly and kept them for too long, thus delaying data analysis.

Some respondents were biased while giving information due to reasons such as privacy and busy schedules. This is because they felt the information can be leaked out to their competitors. The researcher dealt with this by use of an introduction letter from the University of Nairobi, and also by insisting that the data collected will be used only for academic purposes.

5.6 Areas for Further Study

This research study was focused on supply chain integration in pharmaceutical firms in Kenya and specifically focused on the extent of supply chain integration, the impact of supply chain integration on operational performance and the constraints facing supply chain integration. From the study findings, the study recommends that a study be carried out on the impact of supply chain integration in other manufacturing sectors in Kenya.

A further area of study is a study on the strategies of supply chain integration adopted by organizations to enhance their performance.

A study on the supply chain integration risks such as competitors using the information shared and the supply chain integration strategies adopted by organizations for their own competitive advantage.

Finally a study needs to be done on the impact of supply chain integration on business/financial performance and the supply chain performance measures necessary for effective operation and control of supply chains.

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APPENDIX I

QUESTIONNAIRE

This questionnaire has been designed for the sole purpose of collecting data on supply chain integration on firm's operational performance of the pharmaceutical firms in Kenya. The data collected will be treated with a very high degree of confidentiality and it is meant for academic purpose only.
Kindly fill out this questionnaire by putting an "X" on the applicable provided space of the applicable answer.

SECTION A : GENERAL INFORMATION

1. Name of the Organization:.....

2. Address/Location of the organization:.....

3. Year of establishment:.....

4. What is your position in this organization?

a) Information Technology Manager (___)
b) Research and Development Manager (___)
c) Marketing Manager (___)
d) Supply chain officer (___)
e) Other (specify).....

5.Respondent's gender: Male (___) Female (___)

6. Respondent's age bracket:

Less than 30 years	
31-40 years	
41-50 years	
51-60 years	
Over 60 years	

7. How long have you served in the Organization:

Less than 5 years	
6-10 years	
11-15 years	
16-20 years	
Over 20 years	

SECTION B:THE EXTENT OF SUPPLY CHAIN INTEGRATION

Supplier Integration

Please indicate on following statements, the extent to which your firm has embraced Supplier Integration.
The scale below will be applicable:
1= to a very large extent 2= to a large extent 3= to a moderate extent 4= to a small extent 5= to a very small extent.

No.	Statement	1	2	3	4	5
1	We maintain long term relationships between our firm and our suppliers					
2	There exists strategic partnerships between our firm and our suppliers					
3	We consult our suppliers when values of our firm are being developed					
4	The organization seeks assuarance of quality from suppliers					
5	We provide our suppliers with information so that they can improve their quality and responsiveness					
6	Information exchange with suppliers through Information Technology systems is a method commonly used in our fim					
7	Our suppliers participate in the design stage and development of new products					
8	Quick ordering systems with main suppliers have been established					
9	Stable procurement through supplier networks has been achieved					
10	There is participation of our suppliers in the processes of procurement and production					
11	Production plans with our main suppliers are shared					
12	Packaging customization with main suppliers has been achieved					
13	The gains resulting from cooperation with suppliers are equally shared					

Internal Integration

Please indicate on following statements, the extent to which your firm has embraced Internal Integration.
The scale below will be applicable:
1= to a very large extent 2= to a large extent 3= to a moderate extent 4= to a small extent 5= to a very small extent.

No.	Statement	1	2	3	4	5
1	Cross-functional management is extensively used in our firm					
2	Cross-functional integration is very significant for all supply chain initiatives					
3	The cooperation with the marketing department is constant and successful					
4	The production department is always aware of the strategic plans of the firm					
5	Periodic interdepartmental meetings among internal functions are commonly utilised					
6	Information is shared inside the organisation					
7	Data integration among internal functions is achieved through the use of Information Technology systems					
8	Integrative inventory management has been implemented					
9	Real-time searching of the level of inventory has been implemented					
10	There is data integration in production process					

Customer Integration

Please indicate on following statements, the extent to which your firm has embraced Customer Integration.
The scale below will be applicable:
1= to a very large extent 2= to a large extent 3= to a moderate extent 4= to a small extent 5= to a very small extent.

No.	Statement	1	2	3	4	5
1	There is computerization for customer ordering					
2	Market information is shared with customers					
3	Market information with customers is shared through the use of Information Technology systems					

4	Periodic customer meetings are commonly utilised					
5	The organization is aware of the requirements of its customers					
6	The organization measures customer satisfaction					
7	Processes and activities of the organization are designed to increase customer satisfaction levels					
8	Customers are encouraged to provide feedback					
9	The company is actively seeking feedback from customers					
10	The feedback provided by customers is used to improve customer relations, processes, products and services					
11	The organization uses systematic processes for handling complaints					
12	There exists misunderstandings between customers and organization about orders					
13	Customers contribute to the development of the organizational values					

SECTION C: THE IMPACT OF SUPPLY CHAIN INTEGRATION ON FIRM'S OPERATIONAL PERFORMANCE

Supplier Integration

Please indicate on the following statements, the impact of supplier integration on your firm's indicated operational performance. The scale below will be applicable: 1= to a very large extent 2= to a large extent 3= to a moderate extent 4= to a small extent 5= to a very small extent.

No.	Statement	1	2	3	4	5
1	Supplier Integration reduces the materials total costs					
2	Supplier Integration improves the procurement process					
3	Supplier Integration reduces the supplier's delivery lead time					
4	Supplier Integration leads to improved materials quality and variety					

Internal Integartion

Please indicate on the following statements, the impact of internal integration on your firm's indicated operational performance. The scale below will be applicable:
1= to a very large extent 2= to a large extent 3= to a moderate extent 4= to a small extent 5= to a very small extent.

No.	Statement	1	2	3	4	5
1	Internal Integration reduces the average unit manufacturing cost					
2	Internal Integration reduces manufacturing lead time					
3	Internal Integration reduces equipment changeover time					
4	Internal Integration reduces the levels of inventory					
5	Internal Integration increases direct labour productivity					

Customer Integration

Please indicate on the following statements, the impact of customer integration on your firm's indicated operational performance. The scale below will be applicable:
1= to a very large extent 2= to a large extent 3= to a moderate extent 4= to a small extent 5= to a very small extent.

1	Customer Integration improves customer service					
2	Customer Integration leads to customer satisfaction					
3	Customer Integration leads to improved product quality and variety					
4	Customer Integration increases the speed and numbers of product development					
5	Customer Integration leads to on-time delivery of products to customers					

SECTION D: CONSTRAINTS FACING SUPPLY CHAIN INTEGRATION

Please indicate how often you experience supply chain integration constraints in the indicated areas in your organization.
Use the scale of: 1= Never 2= Rarely 3= Sometimes 4= Very often 5= Always

No.	Statement	1	2	3	4	5
1	Information Technology complexity hinders integration					
2	Financial constraints pose a challenge to supply chain integration					
3	The top management does not support supply chain integration					
4	Employees are not willing to share information					
5	There are restrictive Government policies on supply chain integration that restrict the same in our firm					
6	The cultural gap between supply chain stake holders is a problem to supply chain integration in our firm					
7	Fear of integration is a pychological problem to supply chain integration in our firm					
8	Bureaucracy in the organizational structure restricts supply chain integration in our firm					

9. Other supply chain integration constraints experienced by our firm (please specify)

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APPENDIX II

Pharmaceutical and Medical Equipment Firms in Kenya

1. African Cotton Industries Ltd
2. Alpha Medical Manufacturers Ltd
3. Autosterile (EA)
4. Benmed Pharmaceuticals Ltd
5. Beta Healthcare International
6. Biodeal Laboratories Ltd
7. Biopharma Ltd
8. Cosmos Limited
9. Dawa limited
10. Elys Chemical Industries Limited
11. Gesto Pharmaceuticals Ltd
12. Glaxo Smithkline Kenya Ltd
13. Global Merchants Ltd
14. KAM Industries
15. Laboratory and Allied Limited
16. Manhar Brothers (K) Ltd
17. Medivet Products Ltd
18. Novelty Manufacturing Ltd
19. Osschemie (K) Limited
20. Pharm Access Africa Ltd
21. Pharmaceutical Manufacturung Co. (K) Ltd
22. Questa Care Ltd
23. Regal Pharmaceuticals Ltd
24. Revital Healthcare (EPZ) Ltd
25. Scales & Software (K) Ltd
26. Skylight Chemicals Ltd
27. Universal Corporation limited
28. Zain Pharmaceuicals

Source: Kenya Association of Manufacturers - 2015 Directory