SUPPLY CHAIN RELATIONSHIP MANAGEMENT PRACTICES AND PERFORMANCE OF PHARMACEUTICAL FIRMS IN KENYA

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Supply Chain Relationship Management Practices and Performance of Pharmaceutical Firms in Kenya

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DECLARATION

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

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DEDICATION

This work is dedicated to my wife Agnes, daughter Gakii and Makena, Mother Sabina and siblings Naitore, Jemima, Judith and Fridah for their encouragement and their continuous moral support throughout.

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ACRONYMS AND ABBREVIATIONS

ASN	Advanced Shipment Notifications
AVE	Average Variance Extracted
BP	Business Performance
CA	Customer Alignment
CC	Collaborative Culture
CEO	Chief Executive Officer
CFO	Chief Finance Officer
CI	Customer Integration
COO	Chief Operations Officer
CPFR	Collaborative Planning Forecasting and Replenishment
CR	Composite Reliability
CRM	Customer Relationship Management
EI	External Integration
HPV	Health Purchasing Victoria
HR	Human Resource
ICT	Information Communication Technology
IGA	Individual and Group Attribute
IORS	Inter-Organizational Relationships
IOS	Inter-Organizational Systems
IPRS	Interpersonal Relationships
IR	Internal Relational Behaviour
IS	Information Systems
IT	Information Technology

JP	Joint Planning
JPSPM	Joint Problem Solving and Performance Measurement
KMV	Key Mediating Variable
KPI	Key Performance Indicators
MBIS	Market Based Information Systems
MOH	Ministry of Health
NHIF	National Insurance Fund
NPD	New product Development
NT	Network Theory
OS	Organizational Structure
PLS	Partial Least Squares
PLS	Partial Least Square
PM	Performance Measurement
PSC	Pharmaceutical Supply Chain
R&D	Research and Development
RBV	Resource Based View
RFID	Radio Frequency Imaging Device
ROI	Return on Investments
RS	Resource Planning
SA	Shareholder Alignment
SCC	Supply Chain Collaboration
SCI	Supply Chain Integration
SCM	Supply Chain Management
SCP	Supply Chain Performance

SLR	Systemic Literature Review
TCE	Transactional Cost Economies
TCT	Transactional Cost Theory
TGA	Therapeutic Goods Administration
TMS	Top Management Support
UNIDO	United Nations Industrial Development Organisation
WHO	World Health Organisation

OPERATIONAL DEFINITION OF TERMS

Collaborative planning: Capability of two or more autonomous firms working effectively together, planning and executing supply chain operations toward common goals (Cao *et al.*, 2010).

Coordination: Organizing the activities of two or more groups so that they work together efficiently work and know what the others are doing (Cao *et al.*, 2008).

Firm: A business organization, such as a corporation, limited Liability Company or partnership that sells goods or services to make a profit (Gopal, 2012).

Information-sharing: The extent, to which a firm shares a variety of relevant, accurate, complete and confidential ideas, plans, and procedures with its supply chain partners in a timely Manner (Cao *et al.*, 2010**)**

Inter-organizational systems (IOS): Refer to the information technology applications used in mediating buyer-supplier transactions and relationships (Zhang, Xue & Dhaliwal, 2016).

Performance: The degree of success in achieving organization's objectives (Khalid, Islam & Ahmed, 2019).

Pharmaceutical supply: The means through which prescription medicines are delivered to patients.

Process Alignment: Consistency between strategic goals, metrics and activities (Wong et al. 2012). In other words, the process of co-developing systems to evaluate and publicize each other's Performance, sharing costs, risks, and benefits among supply chain partners (Cao *et al.*, 2010)

Relationship Management: A purposive alliance between a supplier and a buyer to facilitate the exchange, sharing or development of resources or capabilities to achieve mutual benefits thus allowing suppliers and customers to focus on their core activities of providing quality products and services (Cao *et al.,* 2015).

Resilience building: Capacity to rebound from adversity, failure or even positive events (Youssef and Luthans, 2007) or the capacity for an enterprise to survive, adapt and grow in the face of change (Pettit *et al.,* 2010).

Supplier: An entity that supplies goods and services to another organization. This entity is part of the supply chain of a business, which may provide the bulk of the value contained within its products (Choppra, 2010)

Supply Chain: The network of all the individuals, organizations, resources, activities and technology involved in the creation and sale of a product, from the delivery of source materials from the supplier to the manufacturer, through to their eventual delivery to the end user (Choppra, 2010).

Supply chain integration (SCI) -The degree to which an organization strategically collaborates with its supply chain partners and manages the intra- and inter-organization processes to achieve effective and efficient flows of products, services, information, money and decisions, with the objective of providing maximum value to its customers (Zhao *et al.,* 2008).

Transparency: Confidence that a firm's partner will not act opportunistically and exploit the firm's vulnerabilities (Singh & Srivastava, 2016).

ABSTRACT

The purpose of this study was to determine the influence of supply chain relationship management practices on the performance of pharmaceutical firms in Kenya. Previous studies have concentrated on examining supply chains in other sectors but few studies have been conducted on supply chain relationships management and performance in the pharmaceutical industry. The study was of significance to policy makers, researchers, pharmaceutical firms and supply chain practitioners. A conceptual framework was used to depict how the conceptualized independent variables; Transparency, resilience building, Collaborative planning and process alignment relate to dependent variable; organizational performance. The study sought to establish the moderating effect of inter-organization systems (IOS) on the relationship between supply chain relationship management practices and organizational performance. The study was underpinned by; stakeholder theory, dynamic capabilities theory, systems theory, network theory, social technical systems theory and strategic choice theory. Descriptive research design was used to explain what, where, when and how of the problem. Census sampling technique was utilized, where all the 171 pharmaceutical firms that formed the study population were enumerated. Some of the limitations faced during the study included; reluctance of the respondents to answer the questionnaires for fear of information leaking to competitors, tight schedules of respondents and caution when dealing with members of the public. A drop and pick method of data collection was adopted where a questionnaire was administered per firm to supply chain managers or their representative. The number of responsive questionnaires were 134 representing 78% response rate while 37 were non responsive representing 22%. A pilot study was conducted to test the reliability and validity of the data collection instrument through Cronbach alpha and Kaiser-Meyer-Olkin test respectively. To test for data characteristics, normality test, hypothesis test, heteroscedasticity test and multicollinearity tests were carried out, while to test the strength and direction of relationship between independent and dependent variables, Correlation analysis and linear regression analysis were done. The results of the study showed positive and significant relationship between transparency, resilience building, collaborative planning, process alignment and firm performance. The results further showed that inter-organization systems significantly moderated the relationship between supply chain relationship management practices and organizational performance. The study made an important conclusion that when relationship management is properly done in regard to collaboration, transparency, resilience building and process alignment, then it will support performance of pharmaceutical firms through increased market share, higher returns on investment, improved customer service levels, reduced lead times, responsiveness and stable supply chains. The study made important recommendations that firms should adopt supply chain relationship management strategies through transparent collaborative efforts, building resilient and responsive supply chains as well as aligned supply chains and business processes for improved performance. The research pointed the need for further studies to explore other factors of supply chain relationship management practices that influence performance both in pharmaceutical industry and other sectors of the economy.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Supply chain Relationship management is a purposive alliance between a supplier and a buyer to facilitate the exchange, sharing or development of resources or capabilities to achieve mutual benefits and allows suppliers and customers to focus on their core activities of providing quality products and services (Cao *et al.,*2015). The effectiveness of supply chain (SC) relationship is influenced by the ability of the focal organization and its supply chain partners to effectively configure their integration mechanisms (Tsanos & Carlos, 2015). Supply chains are built through interpersonal relationships (IPRs) such as affection, personal communication and credibility that in turn influence inter-firm relationships (Barnes *et al.,* 2015, Bill *et al.,* 2016). Personal affection is human feelings, sentiments, and emotion that reflect closeness of the relationship between individuals.

The value created in the relationship is a construct embracing customer concepts, interaction response capacity, customer empowerment and customer value management (Song et al., 2016). Once the other party responds and the interaction commences, both firms gradually make commitments based on the trust that develops (Hastings *et al.,* 2016; Ying-Pin, 2016). It may improve a firm's performance and its customer-based relational performance. Its objectives are to increase profitability, revenue, and customer satisfaction (Sweeney Group, 2012). Customer relationship management (CRM) involves all of the corporate functions such as marketing, manufacturing, customer services, field sales, and field service required to contact customers directly or indirectly (Paul & Jongbok, 2012). The three commonly used measures of corporate performance range from financial, productivity, profitability and market share (Firer & Mitchell, 2013).The Pharmaceutical supply chains (PSC) represents the path through which essential pharmaceutical products are distributed to the end users (Ying & Liz, 2012), with the right quality, at the right place and at the right time (Shabaninejad *et al.,* 2014).

Products are delivered to company's warehouses, wholesale distributors, retail pharmacies, hospital pharmacy and finally to the end users (Mehralian *et al.*, 2012). It also includes expenditure of high cost and time in conducting clinical trials with low success rate in product discovery and clinical development, generic competition at the end of product patent life followed by high uncertainties in demands and capacity planning (Lainez *et al.*, 2012). In the Indian context, Mahajan et al. (2015) observed that the pharmaceutical industry has largely capitalized on its low-cost production of generic drugs. It includes the internal chain such as patient care units, hospital storage and the external chain such as producers, purchasers and distributors (Mehralian *et al.*, 2012).

Pharmaceutical chains and relationships are centered on competing branded medicines and are exposed to complex interactions between various players such as government bodies, health-care providers and manufacturing firms (Goswami *et al.*, 2016). In the past, pharmaceutical firms did not adopt supply chain management concepts but today several factors are forcing pharmaceutical firms to change their traditional manners of conducting business (Ahmad *et al.*, 2012). Their supply chains are more complex and different from other industry supply chains as they handle a diversity of items in widely varying quantities in response to the large number of diagnosis types and procedures (AbuKhousa *et al.*, 2014), and also because they require the participation of different stakeholders such as pharmaceutical manufacturers, wholesalers, distributors, customers, information service providers and regulatory agencies (Rajesh *et al.*, 2016).

1.1.1 Pharmaceutical Firms

The pharmaceutical firms represented firms involved with the production and distribution of medicines or drugs for treatment of different types of ailments McKinsey, 2015). Pharmaceutical firms are involved in research, development, manufacture, marketing and distribution of pharmaceutical products that are globally regulated because of the unique nature of supply and demand (Rasekh *et al.*, 2012). Scientific and technological transformation occurs in the pharmaceutical industry that allow drug producers to produce new profitable medicines even in conditions of

diseases that cannot be treated well today and have formerly persisted against all treatments (Gholamhossein *et al*, 2015).

In the United states of America(USA) pharmaceutical industry is currently facing unprecedented challenges caused by slower sales growth, expiring patents, increasing competition from generics, shorter product life cycles, tighter regulations, adverse media coverage, reputational damage and a decline in the number of new innovative drugs under development (ITA,2016).The Australian pharmaceutical industry is highly fragmented but regulated by government regulatory agencies such as the Therapeutic Goods Administration (TGA) and state contracting bodies such as Health Purchasing Victoria (Vikram & Caroline, 2011). Indian pharmaceutical industry is becoming increasingly blurred with increasing complexity due to large customer base (Rasekh *et al*. 2012). China is the global leader in the supply of active pharmaceutical ingredients and serves manufacturers around the globe. In order to align and avoid shortages of key products, pharmaceutical supply chains to their objectives, many companies are adopting supply chain relationship management strategies for seamless, stable and visible supply chains (Huang *et al*.,2014).

1.1.2 Performance of Pharmaceutical Firms

Organizational performance in this context, refers to how well the organization is doing in meeting its vision, mission and goals. The measures of performance include profitability or return on investment, productivity, innovation and adaptation, increased market share and customer satisfaction among others (Cristina *et al.*, 2012). Global pharmaceutical industry has witnessed a rapid growth over the years and emerged as one of the fastest growing industries in the world. The value of the global pharmaceutical market was estimated to be $816bn in 2016 and is projected to grow to USD 1.3 trillion by 2020, representing an annual growth rate of 4.9 percent.

China pharmaceutical industry has been on steady growth to become the second largest in the world estimated to surpass USD 300billion by the end of year 2018 and was forecasted to grow to grow to USD 574 by 2022. (Jordana *et al*.,2019). The pharmaceutical industry in India has experienced rapid growth accounting for 20% of global exports in volume and the largest generic medicines exporter (Guan & Rehme,

2012). The industry has been globally ranked third largest country in terms of production volume after USA and china (Jigeesh *et al*., 2016). The manufacturing market size was valued at USD 324.42 billion in 2018 growing at compound annual growth rate (CAGR) of 14% from 2021 to 2028. The total pharmaceutical sales in USA accounted for $333 billion constituting 1.9% of GDP and 10.7% of total healthcare expenditure in 2016 (International trade administration (ITA) (2016)**.** China is the second largest pharmaceutical market in the world, forecasted to grow from $108 billion in 2015 to $167 billion by 2020, representing an annual growth rate of 9.1 percent (ITA, 2016). In 2011, Germany pharmaceutical sector was the fourth largest worldwide after the United States, China and India with annual sales of 32.25 billion Euros (SESRIC, 2015). Mexico is Latin America's second-largest pharmaceutical market, and a leading producer of high-tech medicines including antibiotics, anti-inflammatory drugs, cancer treatment procedures, and others. In 2015, Mexican pharmaceutical sales reached US$11.7 billion, and are expected to grow to a level of US$20.1 billion by 2025

Tanzania imports about 70% of the national drug requirement and local production accounts for about 30%. The pharmaceutical sector in Tanzania consists of eight manufacturing industries all producing generic pharmaceutical products using imported active pharmaceutical ingredients from India and China (Ogulini & Shukrani, 2012). The pharmaceutical expenditure reached TZS900bn (USD442mn) in 2015, and is forecasted to grow by 13.1% to reach a market size of TZS1.02trn (USD463mn) by 2023 (BMI, 2016). Several global demographic and economic trends are driving pharmaceutical consumption, including a rapidly aging world population and an associated rise in chronic diseases, increased urbanization and higher disposable incomes, greater government expenditure on healthcare and growing demand for more effective treatment (International trade administration (ITA) (2016).

In Uganda as of December 2019, Uganda had a total of 19 sites licensed for the manufacture of medicines and health supplies although only 11 of these were involved in commercial production of pharmaceuticals (UNIDO, 2013).

Kenya is the biggest maker of pharmaceutical items among COMESA countries controlling 50% of the regions market (Export Processing Zone, 2015, Pharmacy and Poisons Board, 2015). An estimate of the Kenyan pharmaceutical market by Business Monitor International (BMI, 2017) showed that expenditure on prescription medicines in 2016 was Ksh 32.3billion which constituted 90.7% of the total market. The drug distribution system in Kenya can be classified into public (government), NGO, and private channels. The private sector is served by distributors (distributing both imports and locally-manufactured goods) and directly by local manufacturers (UNIDO, 2012). The forecast of Kenyan market by 2020, is KES136.08bn (USD1.28bn), experiencing a compound-annual growth rate (CAGR) of 13.2% (BMI, 2016).

1.1.3 Relationship Management

Supply chain relationship is a form of exchange dependence between exchange members where all the parties are willing to align their processes for competitive advantage (Kathleen *et al.,* 2016). A relationship develops when one of the firms takes the initiative and contacts the other party (Hastings *et al.,* 2016). Market exchanges occur because all parties involved expect to benefit from the exchange (Ying-Pin, 2016). Relationships become stronger and more productive over time, as buyer–supplier relationships are built up through legal, formal and informal exchange processes, and relation-specific investments that are continuous in nature (Hastings *et al.,* 2016). Pharmaceutical firms are embracing the concept of supply chain relationship management to provide affordable and innovative medicines by focusing on customer requirements. To achieve such goals, control over the supply chain is imperative to enable firms to offer high quality products at the right time and at competitive prices and thus improved performance (Khanna, 2012). These efforts lead to greater customer satisfaction, increased return on investment and increased market share to those companies that have developed closer ties with customers (Daniel *et al.,*2016).

Supply chain relationships are built around partnerships, collaborative efforts, transparent, resilient and aligned supply business processes. Collaborative planning

is a participatory approach to developing an architectural design for comparative relationship among many stakeholders. This interactive process is directed towards consensus building and implementation of common goals (Cao *et al.,* 2010). Resilience building is the ability to adapt to the changing conditions through identification of emerging threats and their impact on the business. The willingness to be flexible and creation of communication channels that allows decisions to be made, confers a competitive advantage to the organization (Pettit *et al.,* 2010). Transparency in supply chain involves flow of accurate and timely information to provide a visible stable supply chain. By increasing supply chain transparency, firms can connect with their suppliers, customers and build trust to respond faster to the changing market conditions (Singh & Srivastava, 2016). Process alignment is the synchronization of business process objectives and performance metrics with the firm's objectives and strategies to avoid conflicting and uncoordinated activities. This provides clarity and uniformity of tasks and procedures towards achieving the desired goals (Wong *et al.* 2012).

In India, pharmaceutical supply chains are adopting customer relationship management (CRM) strategies through technology to organize, automate and synchronize business processes (Fowler & Goh, 2012. The objective of supply chain relationship management in this sector of the economy is to enhance profitability, income and customer satisfaction as a strategic approach towards performance (Sambasivan *et al.,2012).* Supply chain relationship management has emerged as a concept of managing company's interactions with clients, sales agents and customers (Luhmann,2013). In china, pharmaceutical supply chains relationship management involves linkages between wholesalers, retailers and hospitals. Chinas pharmaceutical industry supply chains are competitive and resilient playing an integral part in continuously bringing stability to the global health care ecosystem (Fredrik *et al.*,2016).

In the united states of America (USA), pharmaceutical supply chains are complex and are managed through the principle of "back up capability" to provide uninterrupted supply of medication. These chains are highly regulated through collaborative partnerships with all the stakeholders to provide necessary information

for decision making (Hammervoll *et al.*,2017). Supply relationship management have been adopted as a method of ensuring, improved profitability, higher customer satisfaction and increased market share (McAdam *et al*.,2014).

In Sub Saharan Africa, implementation of pharmaceutical supply chain relationship management has proven to be more complex than in other sectors because it requires the participation of many different stakeholders, and also because it is highly influenced by legislations and by healthcare professionals (AbuKhousa *et al.,* 2014, Aronsson *et al.,* 2011). From this distribution perspective, supply chain uncertainty is related to the various attributes associated with the demand, such as product variety and required response time (Hung, 2012). Pharmaceutical Supply chain relationships in Uganda have been operating as loosely and poorly linked due to under-resourcing and fragmentation. In Tanzania, pharmaceutical supply chains relationships are growing with the growth of the industry expected to grow by 28% from the current 397 suppliers of imported pharmaceuticals (UNIDO, 2015). In Rwanda, pharmaceutical supply chain relationships are poorly developed lacking coordination and highly fragmented (Pinna *et al.*,2015). To ensure robust uninterrupted supply of pharmaceutical products the government has taken a collaborative approach with the health care institutions. The private pharmaceutical supply chains are not well structured and relationships exists at arms-length (Martin, 2014). The supply chain in Kenyan pharmaceutical industry is more robust, visible and agile making it more responsive to customer needs. This is due to collaborative efforts of supply chain relationship management strategies geared towards building a stable and mutually beneficial relationships. Building cooperation and increasing coordination during the relationship enables parties to improve their performance in a long and good quality relationship (Hinkka & Framling 2013). Downstream supply chain involves different types of customers, which include distributors, wholesalers and retailers, before the products reach the final end users (Levy & Weitz, 2011). The supply chain has a highly fragmented pyramidal structure, characterized by poor relationships with a few manufacturers and importers or subsidiaries at the top and a large but undefined number of retailers at the base (Odhon'g & Omolo, 2015). The outcome of the highly distorted and fragmented commercial distribution chain is a market characterized by many low-quality retailers (PSP4H, 2014).

1.2 Statement of the Problem

It is expected that supply chain relationship management leads to improved performance of pharmaceutical firms. However, the performance of these firms in Kenya have remained below standards. Many concerns exist regarding the ability of the supply chain to respond to the changing market requirements. While robust growth is forecast for pharmaceutical industry in Kenya, significant concerns exist with regard to pharmaceutical supply chain relationship management with Anti-Counterfeiting and Product Protection Program (A-CAPPP, 2012) and Business Monitor International (BMI,2016) estimating losses encountered amounting to 30% of pharmaceutical products sold and as much as Ksh 22 billion losses annually. With the changing customer behaviors, increased competition, shorter product life cycles, fragmented supply chains in the pharmaceutical industry remain an obstacle to achieving the desired levels of performance (Gholamhossein,2015).The net results of these are high costs of operation, reduced market share, reduced sales volumes, low returns on investments, high inventory costs, poor forecasting and increased lead times that have impacted performance of pharmaceutical firms in Kenya (Thani et al.,2011).

In United Kingdom, Wieland and Wallenburg (2013) investigated the influence of relational competencies on supply chain resilience with the objective of exploring resilience domain in supply chain management while Carla *et al.,* (2014) studied the role of procurement in Supply Chain Management with the objective of understanding the role of procurement in identifying and managing the intra and inter-organizational issues which impact organizational performance. In Kenya, Kenneth and Muli (2012) conducted a study on the Factors influencing the influx of counterfeit medicines in Kenya among small and medium enterprises. Muthoni (2015) studied the supply chain integration and performance of pharmaceutical firms in Kenya. Ochieng (2018) researched on supply chain resilience and organizational performance of pharmaceutical manufacturing companies in Nairobi. Based on these and other previous studies, there was need to carry out further studies on the "supply chain relationship management practices on performance of pharmaceutical firms in Kenya"

1.3 General Objective

The general objective of this study was to determine the relationship between supply chain relationship management practices and performance of pharmaceutical firms in Kenya.

1.3.1 Specific O bjectives

1) To determine how Transparency affects performance of pharmaceutical firms in Kenya
2) To evaluate the effects of resilience building on performance of pharmaceutical firms in Kenya
3) To establish the influence of collaborative planning on performance of pharmaceutical firms in Kenya
4) To examine how process alignment affects performance of pharmaceutical firms in Kenya
5) To evaluate the moderating effect of inter- organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya.

1.4 Hypotheses

1. **H0**: There is no significant influence of Transparency on performance of pharmaceutical firms in Kenya

2. **H0**:There is no significant influence of resilience building on performance of pharmaceutical firms in Kenya

3. **H0**: There is no significant influence of collaborative planning on performance of pharmaceutical firms in Kenya

4. **H0**: There is no significant influence of process alignment on performance of pharmaceutical firms in Kenya.

5. **H0**: There is no moderating effect of inter- organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya.

1.5 Justification of the Study

1.5.1 Policy Makers

The republic of Kenya will find this study useful in policy development, establishing collaborative mechanisms with the private sector and providing an important insight on how to promote growth of pharmaceutical industry for more employment creation and economic growth. The government of Kenya will also find the study useful in establishing the cause of the problems facing the industry and be able to come up with mechanisms of reviving the industry for greater economic gains.

1.5.2 Investors and International Bodies

This study provides an important insight to investors planning to venture into the pharmaceutical industry on how to organize their supply relationships for success, developing strategic market entrance mechanisms and supply chain strategies that promote profitability and sustainability. In this study, it was found out that there was a significant reduction in costs due to better inventory management, reduced waste, supply chain inefficiencies and improved visibility along the supply chain. Customer confidence was boosted due to better service delivery, improved communication and coordination thar led to greater relationship that confer competitive advantage and hence improved performance.

1.5.3 Pharmaceutical firms

The study is an important asset to the management of the various pharmaceutical firms for them to inform supply chain strategies that could be adopted in supply chain to ensure efficiency, responsiveness and customer satisfaction. The supply chain professionals will find this study as an eye opener to move from the traditional arms–length relationship management into more integrated relationships that

promote company growth and competitive advantage in the highly competitive business environment.

1.5.4 Scholars

This study makes several contributions to the literature and practices. The scholars in supply chain and other fields of management science stand to gain through an additional knowledge, challenges presented and act as an avenue for further research to be carried out.

1.6 Scope of the Study

This study focused on identified variables of relationship management through in-depth literature review. Specifically, the focus was on the influence of Transparency, resilience building, collaborative planning, process alignment and the moderating effects inter-organization systems on performance of pharmaceutical firms in Kenya. The study was a census of the entire population covering all the 171 pharmaceutical firms located in Nairobi, where their head offices are located. The researcher conducted the study of pharmaceutical firms since the performance in the sector is greatly influenced by supply chain relationship management. The unit of observation was the supply chain managers as these possess the necessary information on the company's strategic choices in relation to supply chain relations in regard to customers.

1.7 Limitations of the Study

During the study, several respondents feared that the information may reach the competitors and therefore disclosure of some vital information was difficult. There was a challenge of tight schedule of the respondents and desire to safeguard the reputation of the organization due to legal and ethical requirements when dealing with members of the public.

These limitations were mitigated through pre visits and familiarization with the respondents. To create an environment of mutual trust and as an assurance that that information will not be leaked to the competitors, a written letter from the university

was sought to indicate that the study was for academic purpose and was a general reflection rather than focusing on a particular company. The questionnaires were left for respondents to answer during break times between schedules and prior financial preparations to avoid delays in carrying out the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

A literature review is a summary of a set of related research works. It selects information from the papers, organizes and integrates it into a logical justification for the author's research. Literature reviews are typically written by researchers who survey previous studies in order to identify research gaps and to place their own work in the context of previous findings (Jaidca & Khoo 2013). This chapter reviews the literature on the supply chain relationship management and the performance. The chapter includes the review of the theories applicable to the study, conceptual framework, empirical review, critique the research, identify the gaps in the previous studies and gives a summary of the chapter.

2.2 Theoretical Review

According to Árni *et al.,* (2015) supply chain theories provide valuable insight into the questions on how to structure a supply chain as well as on how to manage a supply chain structure. Theorization of SCM is based on borrowing from other theories. This is due to the general understanding of supply chains as meta-organizations, which have established inter organizational relationships and integrated business processes across the borderlines of the individual firm (Árniet *et al.*, 2015). Several theories have been reviewed in this chapter.

2.2.1 Stakeholder Theory

This theory was proposed by Freeman (1999). This theory postulates that an organizational entity has important stakeholders other than the firm, its suppliers and its customers, and these stakeholders seek to achieve diverse and sometimes conflicting goals (Shiu & Chan, 2012). The stakeholders have power to pursue aggressive strategies, and they have legitimate and urgent stakes in the organizations that need to be seriously addressed (Co & Barro, 2009). Co & Barro, (2009) further

pointed out that when the level of trust is high between two parties, they are more open to adopt cooperative strategies (Shiu & Chan, 2012). On the other hand, when the level of trust among stakeholders is low, the firm with a higher stake to proceed with the engagement would adopt aggressive strategies in the relationship. Because of this, those without or with a lesser degree of bargaining power need to rely on the trustworthiness of the firm to ensure that the firm is fair to all stakeholders and fulfill its obligations to its stakeholders (Co & Barro, 2009).

This theory supports Transparency variable because in the seller-buyer relationships, the partners have different goals and power positions and each has ability to competitively outdo one another in relation to power position. When the level of trust is high between two parties, they are more open to adopt cooperative strategies. The theory further explains that when the level of trust among stakeholders is low, the firm with a higher stake to proceed with the engagement would adopt aggressive strategies in the relationship.

2.2.2 Dynamic Capabilities Theory

This theory was developed by Teece (1997). The theory emerged as both an extension to and a reaction against the inability of the resource-based view (RBV) to interpret the development and redevelopment of resources and capabilities to address rapidly changing environments. The theory of dynamic capabilities proposes that the greater the investment in organization practices or routines required for cultivating dynamic capabilities, the greater the potential were for firms to sustain wealth creation in a rapidly changing environment (Eisenhardt & Martin, 2000; Teece *et al.*, 1997).

Dynamic capability as defined by Teece (1997) is the firm’s capacity to assimilate, build and reconfigure internal and external competencies to counter the consistently changing environment. The main assumption of this framework is that an organization's basic competencies should be used to create short-term competitive positions that can be developed into longer-term competitive advantage.

Teece's notion of dynamic capability fundamentally saw corporate agility as paramount for survival of any business. For instance, organizations must understand opportunities and threats to seize the opportunities whilst maintaining competence through enhancing, merging, shielding and if required reconfiguring the organization's tangible and intangible assets (Hammervoll, Jensen & Beske 2017). The prerequisite of learning is shared codes of communication and synchronized search procedures. The organizational knowledge produced exists in new patterns of action, in routines or a new logic of organization.

This theory provides researchers with a solid theoretical foundation to concentrate on identifying unique sets of organizational practices or routines that form distinct resilience capabilities/dimensions (Pettit *et al.,* 2010) and explain the heterogeneity in firms' competitive financial performance levels (Li *et al.,* 2015). This theory supports resilience building variable by showing how dimensions of supply chain resilience relate to performance. Through preparedness, alertness and agility, firms combine, transform or renew firm-level and supply chain-level resources to endure and respond to changes, thereby maintaining a firm's wealth creation capability.

2.2.3 Systems Theory

The systems theory was developed by Ludwig von Bertalanffy (1968). Bertalanffy suggests that the success of an organization depends on several key elements: synergy, interdependence, and interrelations between various subsystems. According to Bertalanffy (1968), a system is a combination of factors that work together to give a result. Systems theory calls for addressing various parts of a system from a holistic viewpoint and not in isolation of each other in tackling the problems in their entirety. The theory advocates for greater understanding of the problems or issues at hand through gauging patterns or the interrelationships that are at play among various entities of a system (Rubenstein *et al.,* 2001). This theory is thus tailored toward systematically explicating the dynamics that characterize the SCM practices (Montano *et al.,* 2001). The primacy of taking recourse to such an integrated approach is paramount as the lack of which would not ensure whether all the vital components are adequately looked into (Tsoukas, 1996; Schlange, 1995).

In a systems theory, approach to modeling, systems are considered as comprising interacting components which maintain equilibrium through feedback loops of information and control. A system is not regarded as a static design, but as a dynamic process that is continually adapting to achieve its objectives and react to changes in itself and its environment (Whitchurch & Constantine, 2009).

According to Luhmann, Baecker & Gilgen, (2013), systems can be considered either open or closed. Open organizations exchange information, energy, or resources with their environments, whereas closed systems do not. In reality, because no social systems can be completely closed or open, they are usually identified as relatively closed or relatively open. The distinction between closed and open systems is determined by the level of sensitivity to the external environment. Closed systems are insensitive to environmental deviations, whereas open systems are responsive to changes in the environment.

This theory supports collaborative planning by depicting the inter-organizational relationships as part of an interdependent system composed of various parts of a system. These systems are not in isolation from each other and jointly solve the problems that affect them. Collaborative planning will involve downstream and upstream approach to tackling issues that affect operations of partner organizations for competitive advantage and improved performance.

2.2.4 Network Theory (NT)

This theory was proposed by Salancik (1995). Salancik proposes that Networks 'embed' transactions in a social matrix, creates markets. Network theory (NT) contributes profoundly to an understanding of the dynamics of inter-organizational relations by emphasizing the importance of "personal chemistry" between the parties, the build-up of trust through positive long term cooperative relations and the mutual adaptation of routines and systems through exchange processes. Network issues include buyer-supplier relationships (Gadde & Haakansson, 2001), third party logistics (Halldorsson, 2002), and management roles in supply networks (Harland & Knight, 2001).

According to Arni *et al*, (2007), the performance of a firm depends not only on how efficiently it cooperates with its direct partners but also on how well these partners cooperate with their own business partners. NT can be used to provide a basis for the conceptual analysis of reciprocity in cooperative relationships (Oliver, 1990). It operates with three key constructs to explain inter-organizational relationships and business networks; activities, resources and actors (Gadde *et al.*, 2010). Connections between firms represent exchange relationships and the underlying contract if present (Hearnshaw *et al*, 2013).

When modeling exchange relationships the critical connection types are the presence of contracts and various flow types including material flows, information flows and financial flows (Ogulini *et al*. 2012). Material flows refer to the transfer of physical products, information flows refer to the transfer of coordinating data and financial flows refer to the transfer of monetary resources, all relating to the exchange of products or services (Hearnshaw *et al*,2013). Relationships combine the resources of two organizations to achieve more advantages than through individual efforts. Links between firms in a network develop through two separate, but closely linked, types of interaction: exchange processes of information, goods and services, and social processes and adaptation processes of personal, technical, legal, logistics, and administrative elements (Johanson & Mattsson, 1987).

This theory supports the variable process alignment in that supply chain relationships are bound by network of relational exchanges that build-up through positive long term cooperative relations and the mutual adaptation of routines and systems through exchange processes. The performance of a firm depends not only on how efficiently it aligns its processes with its direct partners but also on how well these partners cooperate with their own business partners to provide a basis for the reciprocity in cooperative relationships through aligned processes.

2.2.5 Socio-Technical Systems Theory

The theory was proposed by Trist (1981). Socio-technical systems theory stresses the need for social and technical systems to be developed simultaneously (Mitev, 1996), which is beneficial for the development of triadic relationships between suppliers, a

focal firm and customers (Crocitto & Youssef, 2003). According to the socio-technical systems theory, information technology (IT) connects individual organizations and creates effective networks by enabling the transformation process (Venkatraman, 1994; Kumar & Van Dissel, 1996). IT can facilitate efficient and autonomic supply chain information flows in relation to product availability, inventory levels, shipment status and production requirements (Bharadwaj, 2000), and can be used to coordinate collaborative planning, demand forecasts and production schedules among supply chain partners (Olesen & Myers, 1999; Chae *et al.*, 2005). IT is an important driver of SCI because it allows information to be linked seamlessly and effectively (Handfield & Nichols, 1999). It also allows vital information to be captured, organized and shared within and across firm boundaries (Clemons *et al.,* 1993; Mabert & Venkataramanan, 1998; Frohlich & Westbrook, 2001; Vickery *et al.,* 2003). Systematic integration, electronic data interchange and enterprise resource plans are important elements of IT (Tarn *et al.,* 2002, Curran, 1991; Swatman *et al.,* 1994; Hill & Scudder, 2002).

The social technical systems theory supports the moderating variable; inter-organization systems; by stressing the importance of linking organisations through an IT support system to create interdependent through visibility for a successful outcome. Through proper IT systems efficiency and responsiveness is achieved thus creating a strategic fit critical to customer order fulfillment and significant cost reductions hence performance.

2.2.6 Strategic Choice Theory

The theory was developed by Wisner (2003) and it is a perspective concerned with adoption of a supply chain strategy that can address the focal firm's objectives of being responsive. In order to execute the supply chain strategy effectively and achieve responsiveness, the firm requires supply chain practices to enact the supply chain strategy effectively (Wisner, 2003). This strategy requires an end-to-end focus on integration of business processes throughout the value chain for the purpose of providing optimum value to the end-customer (Wisner, 2003).

Marshall (1997) suggests that the first step in developing a supply chain strategy is to consider the nature of the demand for an organization's product. A lean supply chain strategy is aimed at creating cost efficiencies in the supply chain by effectively managing inventory and focusing on improving the quality in the supply chain, thus eliminating waste (Huang *et al.,* 2002; Teller & Towill, 2000). Adopters of the lean supply chain strategy may implement a just-in-time philosophy by delivering the right material, at the right time, at the right place and in the exact amount and may select suppliers based on quality to achieve its low-cost strategy (Borgstrom & Hertz, 2011; Qi *et al.,* 2009). An agile supply chain strategy is aimed at being flexible by adapting quickly and effectively to rapidly changing customer needs (Huang *et al.,* 2002; Teller & Towill, 2000; Lin *et al.,* 2006). It employs a "wait-and-see" approach to demand, not committing to products until demand becomes known (Goldsby *et al.,* 2006).

This theory supports dependent variable "organizational performance" as the main objective that a company strives to achieve. The theory explains options that firms can adopt for competitive advantage by addressing issues of strategic choices. In order to do this, the focal firm may be concerned with adoption of a responsive supply chain strategy that requires an end-to-end focus on integration of business processes throughout the value chain for the purpose of providing optimum value to the end-customer.

2.3 Conceptual Framework

A conceptual framework is a pictorial or diagrammatic representation of the relationship that exists between independent and dependent variables or a scheme of concepts which the research operationalizes in order to achieve set objectives (chakraborty, 2009). It is a set of coherent ideas of concepts organized in manner that makes them easy to communicate to others; an organized way of thinking about how and why a project takes place and how we understand its activities. A conceptual framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny and to communicate this (Imenda, 2014). A conceptual framework is used in research to outline possible courses of

action or to present a preferred approach to an idea or thought.in this study. After the review of the relevant theories that support the independent variables and dependent variable, a pictorial representation was drawn to show the conceptualized influence of relationship management on performance of pharmaceutical firms. It is conceptualized that performance of pharmaceutical firms is influenced by inter-organizational systems, Transparency, resilience building, collaborative planning and process alignment as originally conceived depicted in figure 2.1

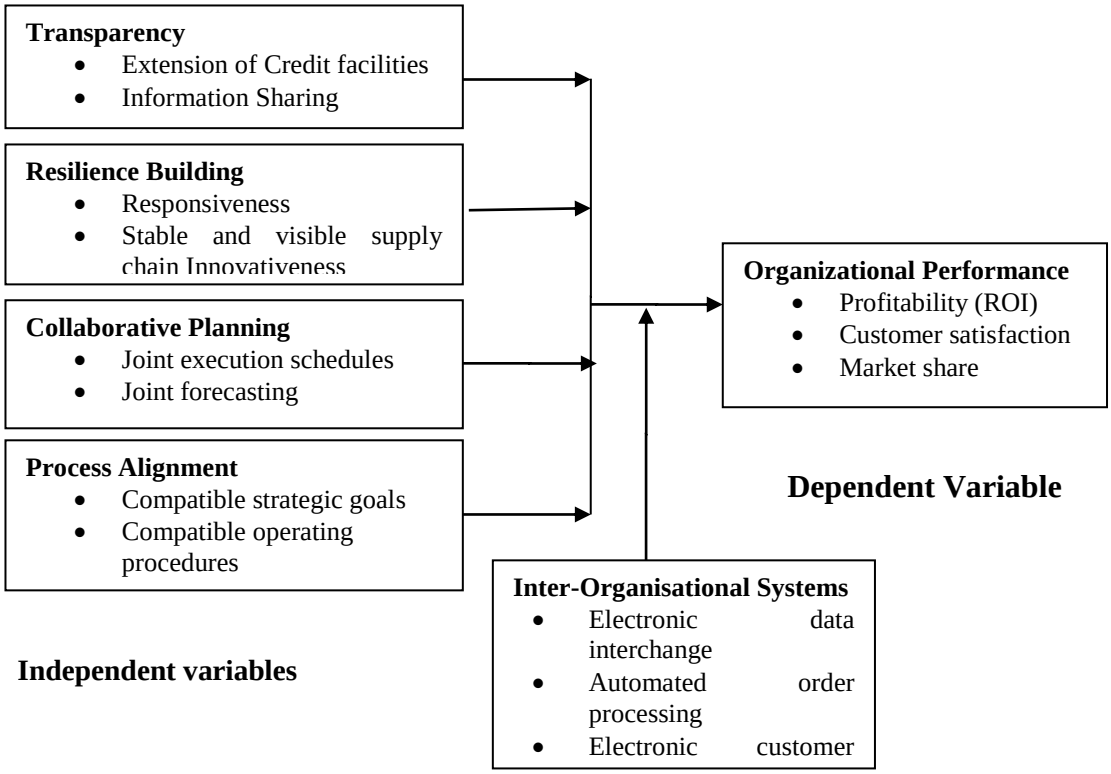


Figure 2.1: Conceptual Framework

2.3.1 Transparency

According to Trombeta *et al.,* (2016) transparency is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party. Examples are the sharing of information on bad payers or debtors, reducing the need to inspect quality or the need to organize payment at the time of delivery. Besides reducing transaction costs, the reduction of

uncertainty and information asymmetry is an important consequence of a trusting relationship (Dyer & Chu, 2003).

Two core components of transparency include benevolence and credibility. Benevolence refers to the belief that members of the partner firm for the relationship are genuinely interested in the focal firm's welfare and will not take unexpected actions while credibility is the belief that people in the partner firm will fulfill the promised role obligations (Zhizhong *et al,* 2011). Firms characterized by high levels of transparency are more likely to implement customer and supplier involvement. Transparency can help reduce cultural conflicts, decrease the perceptions of opportunism, induce reliable information exchange and enable value co-creation (Chen *et al.,* 2011).

According to Houcine *et al.,* (2016), trust starts as a judgment of someone's competence to accomplish a specific task and the sincerity of willingness to do so (Dick & Martin, 2014). The most important reasons why people are willing to establish partnerships in the transaction is that they expect to reduce the harm brought about by the uncertainties of trading partners (Xiao *et al.,* 2013). The formation of trust is depending on the information from the repeated transaction. Information sharing has three aspects; real-time information sharing, information quality, and priority information sharing (Xiao *et al.,* 2013). Information sharing is the key to a seamless supply chain. A high degree of information quality assumes accuracy, timeliness, adequacy, and credibility of the communicated information.

Transparency also mean that interacting parties expect others not to act opportunistically or violate norms of the relationship because it facilitates all three SCI dimensions of strategic alliance, information sharing, and process coordination (Zhang & Huo, 2013). It is fundamental element of the successful "marriage" of strategic alliance to maintain cooperation and significantly contribute to the long-term stability of a supply chain (Sambasivan *et al.,* 2012).

Strategic alliance works best under trust and is based on joined decisions to achieve agreed goals of aligned firms that share resources, information, profits, knowledge and risks (Min, 2015). Improving transparency can reduce risk by lowering the

chances of consumer boycotts and targeted actions by non-governmental organizations, and can also be an explicit part of an organization's strategy (Gligor & Holcomb, 2013). Information sharing is positively affected by the level of trust in the supply chain, because it encourages necessary information sharing and improves information quality and thus performance of the firms involved is deemed to go higher (Wu *et al.,* 2014).

2.3.2 Resilience Building

According to Wileand *et al.,* (2013) resilience is the ability of a supply chain to cope with change. Resilience is formed by two dimensions: agility, which is reactive and robustness, which is proactive. Supply chain resilience is formed by three dimensions: preparedness, alertness and agility (Li *et al.,* 2017). A reactive strategy meets environmental change with a corresponding organization action; whereas, a proactive strategy builds on forecasting and prevention (Shukla *et al.,* 2011). The critical elements suggested by the reactive approach to supply chain resilience include alertness and agility. Supply chain agility refers to the capability of a supply chain to respond to actual changes in a timely manner by adapting supply chain processes.

Agility focuses on "rapid system reconfiguration in the face of unforeseeable changes" and that agile supply chains are capable of responding to marketplace uncertainty and adapting rapidly (Sang *et al.,* 2016). Agility targets: the reconfiguration of supply chain resources quickly to respond to sudden changes in supply demand (Gligor & Holcomb, 2012); the adaptation of supply chain processes to reduce lead time, increase on-time delivery and reduce product development cycle time and the streamlining of supply chain processes to reduce non-value-adding activities (Blome *et al.,* 2013).

A robust supply chain is able to carry out its functions despite some damage done to it. It retains the same stable situation it had before changes occur, it endures rather than responds, it helps to "withstand shocks" rather than to "adjust to shocks" and hence, it is proactive (Wallace & Choi, 2011). Thus, robustness requires the proactive anticipation of change prior to occurrence (Wieland & Wallenburg, 2012).

The proactive approach builds supply chain resilience on preparedness. A supply chain that is prepared endures in the face of changing conditions; it retains the same operating stability that it had prior to the changes, rather than adjusting to the changes; hence, it is proactive (Wallace & Choi, 2011).

Supply chain preparedness is understood as the capability of a supply chain to endure the influence of potential changes. The organization practices for interest alignment prepare supply chain partners with whom they collaborate to withstand changes. Three primary organization practices are involved in aligning interests within supply chain networks. They start with the selection of supply chain partners, which affects the robustness of a supply chain network in a turbulent environment (Li *et al.*, 2017). The key criteria for selection include how willing the supply chain partner is to accommodating the focal firm's business objectives. Second, supply chain partners must have equal access to forecasts, sales data and plans. Third, firms can use a reward system that enables the supply chain members to equitably share risks, costs and improvement initiatives.

Supply chain alertness refers to the capability of a supply chain to detect changes, either from the external business environment or from the internal supply chain network, in a timely manner. Changes in an external business environment include threats and opportunities in the marketplace and among competitors. The external changes can arise from political, economic, social, technological, environmental and legal factors (PESTEL). They can also arise from the task or competitive or industry environment. The capability to detect changes from the internal supply chain network is vital for supply chain visibility, whereby a firm can see goods and information flows from one end of the supply chain to the other and whereby a firm can identify the complex interconnections among the firm's capabilities and changes in supply chain processes. By virtue of identifying operational risks in a timely manner, alertness reduces potential financial losses caused by the bullwhip effect in supply chain disruptions. At a supply chain's strategic management level, alertness provides firms with an orientation toward adapting supply chains to structural shifts in the marketplace and, thus, sustains their wealth-creating performance (Brandon-Jones *et al.*, 2014).

2.3.3 Collaborative Planning

Collaborative planning refers to the capability of two or more autonomous firms working effectively together, planning and executing supply chain operations toward common goals (Cao *et al.,* 2010). According to Nagashima *et al,* (2015, Close collaboration enables supply chain partners to gain a higher visibility on their products' demand and reduce forecasting uncertainty (Eksoz *et al.,* 2014; Hudnurkar *et al.,* 2014; Montoya-Torres and Ortiz-Vargas, 2014; Ramanathan, 2014). The most basic form of collaboration is the simple exchange of inventory and sales information, but cooperative relationships can be adapted to supplier and retailer needs by sharing experiences, risks and profits. These supply chain collaborations can allow suppliers to make accurate decisions early in a product's life cycle (Nagashima *et.al,* 2015). Supply chain collaboration means that two or more firms along the chain work together to create competitive advantages that cannot be achieved by working independently (Eksoz *et al.,* 2014; Hudnurkar *et al.,* 2014; Montoya-Torres & Ortiz-Vargas, 2014; Ramanathan, 2014, 2013).

According to van der Vaart *et al.,* (2012), examples of contingency planning include business continuity planning, risk management planning, disaster planning, and crisis management planning (Gopal *et al.*, 2012). On the suppliers' side, higher accuracy in demand forecasts may be achieved by acquiring information from retailers, especially when compared with predictions made by computer models based on past demand patterns. These two dimensions of collaboration namely; information sharing and collaborative efforts, allow a reduction of inventories within the supply chain network while improving customer service (Nagashima *et.al.* 2015). Collaboration takes various forms, including simple sharing of basic information on stocks and sales, sharing of strategic information and collaborative strategic planning and collaborative product value creation by integrative supply chain collaboration (Hudnurkar *et al.,* 2014; Montoya-Torres & Ortiz-Vargas, 2014; Ramanathan, 2014, 2013).

The most prominent effort of standardization is the collaborative planning forecasting and replenishment (CPFR) model of supply chain collaboration

(Nagashima *et.al,* 2015). CPFR is an information system that enables partnering firms to integrate their inventory planning, forecasting and replenishment processes by sharing information, developing joint forecasts and jointly crafting replenishment plans (Hudnurkar *et al.,* 2014). CPFR aims at sharing customer information such as forecasts and delivery schedules (Huang *et al.,* 2014). The CPFR framework encourages all partners to share sales, inventory, forecast, and all related information to improve forecast accuracy (Nagashima *et.al,* 2015). Such information sharing believes to avoid bullwhip effect as various processes of supply chain namely planning; forecasting, production, and replenishment have impact on cost, profit, inventory levels, stock outs and resource measures. In order to improve supply chain processes and to gain support from other supply chain partners, supply chain management practices such as vendor managed inventory (VMI), efficient consumer response (ECR), continuous replenishment (CR) and electronic data interchange have been suggested (Usha *et al* 2012).

According to Gopal *et al.,* (2014) the benefits of collaboration include improved visibility, higher service levels, increased flexibility, greater end-customer satisfaction, reduced cycle time, and cope with high demand uncertainties. Joint Planning for Executing Schedule (JPES) is one of the factors of collaboration in which two or more firms jointly take purchasing and budgeting to make products and services ready for customers as per the demand (Tsanos *et al.*, 2014). Joint Planning for Increasing Market Share (JPIMS); an external-focused functional area, is the promise in which collaborative venture take decisions jointly on product promotion, pricing policy new product development and prioritizing goals and objectives for the purpose of expanding the market share. Collaborative planning is an antecedent to flexibility. Flexibility is promptness and the degree to which it can adjust its supply chain speed, destinations and volumes in response to changes in customer demand (Sajad & Maryam, 2015).

2.3.4 Process Alignment

Alignment means consistency between strategic goals, metrics and activities (Skipworth *et al.,* 2015). Supply chain alignment is a strategic collaboration and

coordination mechanism between supply chain members to manage intra and inter relationships (Mohamed, 2016). Alignment is the need to be consistent within and throughout different organizational levels to avoid misunderstandings and conflicts (Kuo *et al.,* 2016). The alignment between supply chain strategy and product characteristics leads to better performance in cost, delivery speed and delivery dependability (Levy *et al.,* 2011).

According to Ke *et al.,* (2015), there should be an alignment between supply chain strategy and product characteristics. According to Wong *et al.,* (2012) a well aligned supply chain led to revenue growth, working capital efficiency, operating cost reduction and better perceived customer value across the whole supply chain. Persistent delivery of customer value requires firms to align these competitive dimensions with their downstream partners (Mohamed, 2016). Alignment links four elements namely; the competitive situation, strategy, culture, and leadership style to improve the performance (Ahmed, 2015). Six main enablers to achieve supply chain alignment that affect the shareholder and customers value are: organizational structure, internal relational behavior, and customer relational behavior, top management support, information sharing and business performance measurement system.

Hanson *et al.,* (2012) argued that there is a need to achieve shareholder alignment so that functional strategies and business processes used to deliver competitive strategies are compatible with business strategy and shareholder expectations, such as revenue growth, working capital efficiency, operating cost reduction and fixed capital efficiency (Mohamed, 2016). The core thrust of a lean supply chain is to create a streamlined, highly efficient system that produces finished products at the pace customers demand with little or no waste (Arif-Uz-Zaman & Nazmul, 2014). Functions, which require alignment to deliver either shareholder or customer value within the supply chain field include: purchasing, manufacturing, logistics and operations planning. At an operational level, focal firms need to jointly solve problems and plan with the customers to improve delivery performance. Information sharing is a crucial enabler for supply chain alignment. Information sharing helps to improve visibility and therefore improves the allocation of inventory, production

scheduling and knowledge transfer process. It crucial to share quality information that is relevant, accurate and sufficient in a timely manner (Wong *et al.*, 2012).

Green *et al.*, (2012) state that marketing strategy alignment is the development and implementation of a supply chain level marketing strategy by all supply chain (SC) partners as a way to deliver the highest possible total value to the customers. Proper internal and external alignment throughout the supply chain, among all the functional areas such as logistics, marketing, and finance, will help firms achieve their competitive advantages (Wong *et al.*, 2012). Sharing information and information technology alignment has a positive cost efficiency and customer responsiveness as a measure of the supply chain performance (Ye & Wang, 2013). Customer alignment (CA) is the process and a strategic move whereby business strategy and supply chain strategy are aligned to create customer value (Wong *et al.*, 2012). Customer alignment processes acquire market intelligence and use it to develop business unit and supply chain strategies to respond to customer needs for inter-functional assessment. It allows the necessary adjustment and investment in the organization and supply chains to meet customer needs (Skipworth *et al.*, 2015).

2.3.5 Inter-Organisation Systems (IOS)

Inter-organizational Systems (IOS) refer to the information technology applications used in mediating buyer-supplier transactions and relationships. Use of IT technology such as internet, electronic data interchange, barcoding, and electronic funds transfer, automated order processing, intranet, software application packages and discussion support system can be applied to facilitate the information flow within the SC members (Krishnapriya & Baral, 2014). Firm integrates information systems with its major SC partners to improve data sharing. A collaborative information system makes SC to be more responsive to opportunities and threats arising from global competitors. Information technology acts as a facilitator in providing real time information sharing and permits the participants of a geographically dispersed supply chain to face lesser uncertainty and better inter-firms coordination (Krishnapriya & Baral, 2014).

According to Rajesh *et al.,* (2012) Implementation of IOS enhances lead times and reduces lost shipments and cost inefficiency. These systems facilitates the physical flow of products, information and financial resources between suppliers and buyers, thereby, enabling supply chain partners to act as a single entity and configure their operations on a shared basis (Rajesh *et al.,* 2012). Using IOS, supply chain partners can develop close relationships in the chain structure, which enables them to access each other's privileged data and information. Investment in these systems will automatically bring supply chain integration, better collaboration with partners, and ultimately higher overall performance. Advances in IT such as internet, electronic data interchange, enterprise resource planning and e-business enable firms to rapidly exchange products, information and funds and utilize collaborative methods to optimize supply chain operations (Rajesh *et al.,* 2012).

The need for inter-organizational systems crops out of the global competition and complexity of the business environment. Collaboration and its inherent information exchange are critical factors of supply chain coordination reverse logistics and strategic alliances (Bigdeli, Kamal & de Cesare, 2013). Collaboration is necessary across functional boundaries in a supply chain network for it to reach its maximum potential; firms must be willing to share resources, including technology, people, and information (Fawcett, 2014). In contingency planning, this would include sharing scenario information, best practices, and performance measures along with coordinating planning activities and other functions. Benefits emerge when organizations are willing to work together to understand each other's viewpoints and share information and resources in order to achieve collective goals (Kaushik, 2009). The benefit of collaboration during any inter-organizational process is often improved effectiveness and efficiency of the process. Given that collaboration is shown to improve other supply chain processes, the current study expects IOS in the pharmaceutical sector to have an effect on organizational performance.

Mirkovski *et al.,* (2016) emphasized the importance of ICT in SCM and its ability to reduce coordination costs, operational risk, and opportunism associated with external transactions. ICTs can be efficient platforms for searching, contact and negotiation, which minimize opportunistic behavior and transaction costs. IOIS integration can

enhance supply chain performance by facilitating organizations' information sharing capability and responsiveness to changing customer and market needs (Mirkovski *et al.,* 2016). Additionally, the integration of inter-organizational activities facilitates just-in-time delivery, automatic replenishment and inventory (Kumar *et al.,* 2012). According to Rai *et al.* (2016), the integration of organizational physical, financial and information sharing activities enhances organizations' performance by improving sales volume, markets share and return-on-investment. IOIS and IOA integration facilitate customer relationships and responsiveness by assisting individual organizations to effectively anticipate, track and respond to customer demands, wants and complaints (Sing *et al.,* 2012).

2.3.6 Organizational Performance

According Rompho & Boon-itt (2012), a Performance Measurement System (PMS) is vital in the management of an organization. Performance helps in measuring organizational progress and achieving their business objectives. A Performance Measurement System (PMS) can be defined as the process of quantifying the efficiency and effectiveness of action (Valmohammadi & Servati, 2012). There are many performance measures including cost, benefits such as profit, lead time, customer satisfaction, inventory, and forecast accuracy (Mouchamps, 2014). Suppliers and customers who collaborate by sharing information on and investment in various business processes, such as product development and production planning, are able to respond quickly and efficiently to changing environmental pressures. Integration will therefore strengthen the supply chain, which in turn will improve operational performance (Tsanos & Carlos, 2015). Suppliers might see PMS success as long as it leads to better logistics that lower their costs (Rompho & Boon-itt, 2012).

Supply chain partners may want coordination and collaboration to improve overall business performance, reduce cost, increase profit, and improve forecast accuracy (Usha *et al.,* 2011). The improved performance may be obtained by cost reduction, improved productivity, or increase in quality (Hinkka & Framling 2013). Organizational performance is an important construct which is defined as the degree

of success in achieving organization's objectives (Goyal & Mishra, 2016). Firms can evaluate the channel partners' performance through various metrics, covering multiple performance-dimensions (Mouchamps, 2014). It is argued that the choice of appropriate performance metrics for evaluating channel partners is central to maintaining successful distribution relationships (Waal & Kourtit, 2013). The channel partner's performance has been evaluated through multiple measures ranging from behavioral measures, such as cooperation and commitment to operations measures such as inventory control and inventory cost and accounting and financial measures such as ROI (return on investment), percentage growth, market share, sales revenue and profit margins (Goyal & Mishra, 2016). More observable financial performance measures such as profitability, sales volume, sales growth, ROI and market share are generally emphasized in performance evaluations of channel partners (Goyal & Mishra, 2016).

Other relevant dimensions of performance include dealer cooperation, information sharing, initiatives taken, promotional effort and dealer loyalty. Integration with customers and suppliers across certain operational dimensions can improve information sharing and decision making, and ultimately lead to sustainable competitive advantage (Tsanos & Carlos, 2015). The purpose of measuring organizational performance is to identify success; identify whether customer needs are met; help the organization to understand its processes and to confirm what they know or reveal what they do not know, identify problems, bottlenecks and waste (Arif-Uz-Zaman & Nazmul, 2014).

2.4 Empirical Review

2.4.1 Transparency and Organizational Performance

Wu *et al.,* (2012) studied supply chain partnerships and firm performance based on the commitment-trust theory. The study was done with the objective of using high-tech firms in Taiwan as research subjects to verify the fit of the commitment-trust theory and explore the supply chain relationships among research variables. Study of Taiwan's high-tech industries was conducted to understand co-operation between partners. The study findings indicated that there was a significant positive

relationship between communication, trust and organizational performance. This reveals that if mid and high-ranking executives of a high-tech firm have trust for their partners, they are willing to establish smooth communication channels to share resources and obtain latest information. This study, however, was conducted in Taiwan high tech industries whose operations differ from that of the pharmaceutical sector.

Similarly, Emanuela, (2015) investigated outcomes of inter-organizational trust in supply chain relationship through systematic literature review and a meta-analysis of the empirical evidence with the objective of improving the understanding of inter-organizational trust outcomes in supply chain relationships and organizational performance. The study adopted systematic literature review (SLR) as research methodology and findings indicated that Inter-organizational trust influences a recognizable organizational outcome such as sales growth, cash flow and increased Return on Investment (ROI).

With regard to the cost perspective, the meta-analysis by Emanuela, (2015) demonstrated a modest purchasing cost reduction as a consequence of increased levels of inter-firm trust between partners while providing strong support for the effect of trust on lowered transaction costs-thus enhancing organizational profitability. From a business process perspective, the findings showed that inter-organizational trust has a positive impact on task performance measured by timeline. The study however, presented a methodological gap since meta-analysis do not show the strength of relationship between inter-organizational trust and organizational performance.

In Kenya, Ndungu (2013) researched on the relationship between organizational transparency, disclosure and financial performance of insurance Companies. The study found that organizational performance (measured using return on assets) and financial information disclosure were positively correlated and that the model used was significant. In light of this research, the researcher concluded that transparency and disclosure have positive effects on the financial performance of insurance companies and it was explained that improving the level of disclosure reduces

information asymmetry and cost of capital. This study shows a contextual gap as it focused on insurance companies whose findings may not be generalized for firms in the pharmaceutical sector.

Another study in Kenya by Magenda (2014) on the determinants of supply chain performance among commercial banks in Kenya. The study was guided by the supply chain management theory. The study adopted a descriptive research methodology and conducted a census on 43 commercial banks that are licensed to operate in Kenya. The study findings showed that transparency plays a fundamental role in strengthening the relationship between the organization and its suppliers to also build a good working relationship between the supply chain partners. This highly contributes to organization performance since it is able to get goods and services on time and deliver the same to its customers. This improves the quality of services of the firm and this helps in building a corporate reputation which is essential in enlarging the market share of the firm. The study, however, presents a scope gap as it focused on commercial banks, while this study focused on pharmaceutical firms.

2.4.2 Resilience Building and Organizational Performance

Wieland and Wallenburg (2013) investigated the influence of relational competencies on supply chain resilience with the objective of exploring resilience domain in supply chain management. Survey data collection was utilized from manufacturing firms from three countries, which was analyzed using structural equation modeling (SEM). The findings indicated that communicative and cooperative relationships have a positive effect on resilience, which positively influenced firm performance. The study, however, collected data from only three countries which are quite few for an empirical study. Likewise, Li *et al.,* (2017) conducted an empirical examination of firm financial performance along supply chain resilience; supply chain preparedness, supply chain alertness and supply chain agility. They used survey design to collect data from 77 firms through developed scales for preparedness, alertness and agility and found the findings revealed that supply chain resilience; preparedness, alertness and agility significantly impact a

firm's financial performance. It is also found that supply chain preparedness, as a proactive resilience capability, has a greater influence on a firm's financial performance than the reactive capabilities including alertness and agility, suggesting that firms should pay more attention to proactive approaches for building supply chain resilience (Li *et al.,* 2017). The study, however, shows a conceptual gap since the researchers only focused on three aspects of resilience building (supply chain preparedness, supply chain alertness and supply chain agility).

Carla *et al.,* (2014) studied the role of procurement in Supply Chain Management in achieving supply chain resilience with the objective of understanding the role of procurement in identifying and managing the intra- and inter-organisational issues which impact organizational performance. Study methodology involved conducting of systematic literature review between 2000 and 2013 to answer the single research question proposed. To do so, a content analysis based on the literature was applied to 30 selected papers. The study findings revealed that procurement in Supply Chain Management characterized by resilience enhanced organizational performance. The study findings were supported by that of Lee *et al.,* (2016) whose study showed that dynamic SC capability-building process is an antecedent of SC ambidexterity and that SC ambidexterity is important to firms as it mitigate the negative impact of SC disruptions and enhance business performance. The study by Carla et al., (2014) however, showed a methodological gap as the researchers focused on secondary data leaving out primary data which would have allowed for triangulation of findings.

In Kenya, Ochieng (2018) conducted a study on supply chain resilience and organizational performance of pharmaceutical manufacturing companies in Nairobi. Descriptive design was used and the targeted population for the study was 23 pharmaceutical manufacturing firms in Nairobi. The study was informed by the Strategic Choice Theory and Resource Based view. Correlation analysis was used to establish the relationship between the study variables. The study established that agile supply chain and risk management culture positively and significantly affected organizational performance. The study concluded that supply chain resilience has a positive and significant effect on organizational performance. However, the study focused only on 23 pharmaceutical firms in Nairobi,

which is a small population for generalization of findings in the entire pharmaceutical sector.

Nyang'au (2017) did a research on the Influence of supply chain risk management strategies on performance of food and beverage (F&B) manufacturing firms in Kenya. The research population was 187 food and manufacturing firms drawn from a KAM directory using a census survey method. Structural equation modelling (SEM) R-Lavaan 0.5- 20 was used to find out the influence of supply chain risk management strategies on supply chain performance. The study established that supply chain risk management strategies have an influence on performance of F&B manufacturing firms. This study concluded that the most important SC resilience strategies on the performance were the risk avoidance strategies, control strategies and flexibility strategies. This study showed a scope gap as it focused on food and beverage manufacturing firms whose findings may not be generalized for the pharmaceutical sector.

2.4.3 Collaborative Planning and organizational performance

Hall *et al.,* (2012) studied Inter-organizational IT use, cooperative attitude and inter organizational collaboration as antecedents to contingency planning effectiveness in china with the objective of testing proposed antecedents of contingency planning effectiveness in a supply chain setting. The study examined inter-organizational information technology (IT) use, inter-organizational collaboration and cooperative attitude as antecedents to contingency planning effectiveness at the organization level were examined. A survey method was used to gather data from 103 participants involved in their respective organization's contingency planning and implementation processes. The findings suggested that inter-organizational collaboration, inter-organizational IT use, and cooperative attitude directly impact contingency planning effectiveness. Inter-organizational collaboration mediates the relationships between the other antecedents and contingency planning effectiveness. This study, however, did not focus on the influence of collaborative planning on firm performance, which was one of the objectives of this study.

Similarly, Kumar *et al.,* (2012), conducted a study on collaboration in supply chain with the objective of framing collaboration in supply chain as a hierarchical reflective construct in India. The findings captured the overlap of various aspects of collaboration as a consequence of hierarchical structure of collaboration in which aspects lower in the hierarchy are correlated and give rise to broader dimensions at the higher level. The collaboration reflected Collaborative Culture (CC), Joint Planning (JP), Resource Sharing (RS), and Joint Problem Solving and Performance Measurement (JPSPM). They concluded that Collaborative relationship improved performance in terms of improved visibility, higher service levels, increased flexibility, greater end-customer satisfaction and reduced cycle time. The study showed a scope gap as it was conducted in India, which is a developed nation. The current study was conducted in Kenya which is a developing country. Farhad *et al.,* (2015) also investigated the framework for Collaborative Planning, Forecasting and Replenishment (CPFR) with the objective of identifying and analyzing the main constructs for successful implementation of CPFR and concluded that there is a strong connection between CP with decision making and execution planning and thus successful supply chains need to adopt planning, decision making and execution as key elements of collaboration to enhance firm performance.

In Kenya, Wafula and George (2015) evaluated how strategic supplier collaborations affected organizational performance in Kenya Pipe Line company. The study used sample size of fifty procurement employees. From the findings, networking and communication channels were found to have improved between firm and its suppliers due to strategic supplier partnerships. It had also led to improved delivery time of the products to consumers. This study shows a methodological gap since the authors did not use any inferential statistics to indicate the extent to which strategic supplier collaborations affected organizational performance. The current study employed correlation and regression analysis to show the relationship between collaborative planning and organizational performance. Similarly, study by Berut (2020) on the Influence of Supply Chain Collaboration on Performance of Dairy Processing Firms in Kenya found that the dairy processing firms exploit supply chain …..information sharing, incentive alignment, teamwork and mediation dairy board policies and regulations which had a positive effect on firm performance. This study

was done with focus on dairy processing firms thus showing a scope gap. The current study focused on firms in the pharmaceutical sector.

2.4.4 Process Alignment and organizational performance

Wong *et al.,* (2012) investigated the relationship between supply chain alignment enablers and firm performance. The methodology used in the study was a systematic literature review (SLR) to ensure it is auditable and repeatable. The findings of the study identified there must be alignment between each firm's supply chain strategy and those of its supply chain partners both internal and external. It was concluded that supply chain alignment results in a fit in terms of objectives, structures and processes within and between different functions and members in a supply chain thus enhancing organizational performance. The study, however, focused on past publications and therefore did not conduct any inferential analysis to show the relationship between process alignment and firm performance. In the current study, the researcher conducted correlation and regression analysis to ascertain the relationship between process alignment and firm performance.

Moreover, Hinkka *et al.,* (2013) studied supply chain tracking through aligning buyer and supplier incentives with the objective of depicting how the success of inter-organizational systems (IOS) implementation projects can be increased by aligning the different incentives of buyers and suppliers. The research methodology employed was a case study and its unit of analysis was a network of supplier and wholesaler (buyer) firms acting in the Finnish technical trade industry, which are implementing inter-organizational tracking. The project highlighted the importance of common industry standards, which can help develop own information systems in considering the increasing needs for inter-organizational information exchange thus improving performance. In the same motivation, Skipworth *et al.,* (2015) focused on supply chain alignment for improved business performance with the objective of explaining how supply chain alignment can be achieved and its implications for business performance (BP). A survey approach was selected for the study as it primarily tests existing theories, rather than exploring new and emerging areas. The sample frame comprised 151 randomly selected firms, from a database of 2,338 UK-registered

manufacturing firms that employ over 250 staff. The Findings indicated that shareholder and customer alignment have a direct positive impact on BP, while shareholder alignment (SA) is its antecedent. Nevertheless, the study shows a scope gap as it was conducted among UK registered manufacturing firms while the current study was conducted among pharmaceutical firms in Kenya.

In Kenya, Euster (2016) studied the factors affecting the performance of supply chain financing in Kenya with focus on Commercial Bank of Africa. The researcher studied how financial institutions could enhance supply chain sustainability. The study adopted an interdisciplinary research approach that readily integrated three diverse though complementary theories. The sustainable supply chain financing framework proposal suggested that an opportunity for financial institutions in comparison with information transparency, resource rationalization and alignment of incentives can enhance overall supply chain sustainability. It was concluded that close collaborations between stakeholders is an important factor for banks in enhancing the performance of supply chain financing as agreed to by all respondents. Organizations enhancing information transparency can facilitate the alignment of incentives geared to enhance sound supply chain financing performance. The study shows a scope gap as it was conducted among commercial banks while the current study was conducted among pharmaceutical firms in Kenya.

2.4.5 Supply Chain Relationship Management, Inter-Organizational Systems (IOS), and Organizational Performance

Haque and Islam (2013) investigated the effects of supply chain management practices on customer satisfaction from pharmaceutical industry in Bangladesh with the objective of finding out the influencing dimensions of SCM practices and empirically examine the conceptual framework of proposed relationships and customer satisfaction. A quantitative survey was carried out among the managers and executives of various drug manufacturers in the pharmaceutical industry of Bangladesh. The findings of the study indicated that SCM practices as observed in the industry comprise three dimensions, namely, collaboration and information sharing, logistics design and IT infrastructure. This study addressed supply chain

management practices in relation to customer satisfaction while leaving out aspect of relationship management in relation to performance.

The study identified IT adoption as a useful tool in improving four primary operational areas, namely; transaction processing, SC planning and collaboration, order tracking, delivery coordination and material forecast without depicting relational antecedents to IT adoption process. This is echoed in other studies that underscore the fact that should various communication software, tools or technologies, such as, enterprise resource planning (ERP), electronic data exchange (EDI), decision support system (DSS), be in place, it would go a long way in enforcing a safe and seamless exchange of information across the supply chain; this would result into a reduction in costs and in lead time for the delivery of products to the customers, culminating into improved customer satisfaction. The study focused on customer satisfaction as the dependent variable while the current study focuses on firm performance as the dependent variable.

Sing *et al.,* (2012) studied the Influence of inter-organizational integration on business performance with the objective of investigating the mediating role of organizational level supply chain activities on inter-organizational information systems (IOIS) and activity integration on business performance of retailing organizations within Australia. The study followed a causal research approach and survey methodology to collect data from the managers of food and hardware retailers. The study findings indicated that inter-organizational information systems (IOIS) and activity integration have positive effects on customer responsiveness and financial performance of organizations. Organizational-level supply chain functions mediate the relationships between IOIS and activity integration and customer responsiveness, as well as financial performance. The integration of IOIS and inter-organizational alignment (IOA) with supply chain partners helps organizations to attain supply chain benefits such as just-in-time delivery, warehouse and on-shelf inventory reduction, cost minimizations, supply chain flexibility and traceability. The results of the mediating effects suggested that, facilitating supply chain activities at organizational levels helps integration of information systems and activities could improve customer responsiveness and financial performance. The study was

conducted among retailing firms in Australia, whose findings may not be generalized for the pharmaceutical industry for a developing nation like Kenya.

Dehui *et al., (*2014) studied Relationships between intra-organizational resources, supply chain integration (SCI) and business performance with the objective of exploring the effects of intra-organizational resources, including top management support (TMS) and information technology (IT), on inter-organizational capabilities including supply chain integration (SCI) with a focus on supplier integration (SI) and customer integration (CI) and business performance. The study adopted descriptive research methodology where data was collected using questionnaire and observations made during company visits and interviews. The findings empirically demonstrated that TMS and IT are two important intra-organizational resources that serve as vital enablers of SCI and have different effects on its different dimensions. The study, however, did not focus on firms in the Kenyan context, thus limiting the generalization of the findings.

Okore & Kibet (2019) studied the influence of information sharing on supply chain performance in the tourism industry in the county government of Kakamega, Kenya. The study aimed at determining the influence of collaboration and networking on supply chain performance of tourism industry in Western Region. An explanatory survey design was used. The target population comprised of 459 employees working in 4 licensed tour companies and 5 licensed hotels in Kakamega County. It was found that networking influences supply chain performance. The study concluded that information sharing influences supply chain performance of tourism industry. The research recommended that the supply chain department needs to adopt effective networking programs in order to enhance customer satisfaction and supply chain efficiency hence increasing access of information about the suppliers and the management of the hotels and tour companies should provide different collaboration programs in order to increase suppliers to collaborating with other suppliers so as to provide information for the hotels and tour companies about their customers. The study focused on tourism industry whose operations differ from that of the pharmaceutical industry, showing a scope gap. The current research focused on pharmaceutical firms in Kenya.

2.4.6 Organizational Performance

Cristina *et al.,* (2012) studied the moderating effect of supply complexity on supply chain integration and performance with the objective of investigating the effectiveness of supply chain integration in different contexts. More specifically the study aimed at showing that supply chain relationships enhance integration in buyer-supplier relationships characterized by high supply complexity. The study utilized a survey-based research design developed to measure different dimensions or aspects of supply chain integration and supply complexity. The study findings showed that supply chain integration increases performance if supply complexity is high, while a very limited or no influence of supply chain integration can be detected in case of low supply complexity. The results also showed that in high supply complexity environments the use of structured communication means to achieve supply chain integration has a negative effect on cost performance. These findings relate well with the objectives of the study in seeking how relationships in supply chain could be built while embedding IT tools for improved outcomes. However, the study did not focus on relational capital and IT tools that could be put in place to allow integration and performance.

Tipu *et al.,* (2014) studied the relationship between Supply chain strategy, flexibility, and performance with the objective of comparing the supply chain strategy, flexibility and performance in the context of SMEs in Canada and Pakistan. The study methodology was based on a quantitative approach using a questionnaire survey from a total of 170 small and medium-sized Pakistani manufacturing firms. The findings confirmed relationships between strategy, flexibility, and performance in the context of pharmaceutical supply chain. The survey results revealed that SMEs in Pakistan adopt follower's strategy in order to achieve financial and non-financial performance such as reduced lead times, customer satisfaction and cycle times. The study focused on supply chain strategy in Pakistan that could be corporate in nature and flexibility to its adoption and implementation without an analysis of the relationship management strategies that needed to be put in place for its success. This study therefore delves into relationship management strategies and the enabling IT platform for improved performance.

2.5 Critique of the Literature Reviewed

Wu et al., (2012) studied supply chain partnerships and firm performance based on the commitment-trust theory in Taiwan high-tech firms indicated that there was a significant positive relationship between communication, trust and organizational performance. The study only sought to verify the fit of the commitment-trust theory and explore the supply chain relationships among research variables disregarding other supply chain theories.

Carla *et al.,* (2014) studied the role of procurement in Supply Chain Management in achieving supply chain resilience with the objective of understanding the role of procurement in identifying and managing the intra- and inter-organizational issues which impact organizational performance and it was found that procurement in Supply Chain Management characterized by resilience enhanced organizational performance. The study failed to show the extent to which supply chain resilience improves firm performance.

Ochieng (2018) conducted a study on supply chain resilience and organizational performance of pharmaceutical manufacturing companies in Nairobi. The study established that agile supply chain and risk management culture positively and significantly affected organizational performance. The study concluded that supply chain resilience has a positive and significant effect on organizational performance. However, the study focused only on 23 pharmaceutical firms in Nairobi, which is a small population for generalization of findings in the entire pharmaceutical sector.

Skipworth et al., (2015) focused on supply chain alignment for improved business performance with the objective of explaining how supply chain alignment can be achieved and its implications for business performance (BP). However, a survey approach was selected for the study as it primarily tests existing theories, rather than exploring new and emerging areas.

Moreover, Hinkka *et al.,* (2013) studied supply chain tracking through aligning buyer and supplier incentives with the objective of depicting how the success of inter-

organizational systems (IOS) implementation projects can be increased by aligning the different incentives of buyers and suppliers. The research methodology employed was a case study of Finnish technical trade industry which has its limitation in applicability and generalization of the findings.

2.6 Research Gaps

The empirical literature reviewed depicts some research gaps. Emanuela, (2015) investigated outcomes of inter-organizational trust in supply chain relationship through systematic literature review and a meta-analysis of the empirical evidence with the objective of improving the understanding of inter-organizational trust outcomes in supply chain relationships and organizational performance. The study however, presented a methodological gap since meta-analysis do not show the strength of relationship between inter-organizational trust and organizational performance.

Ndungu (2013) researched on the relationship between organizational transparency, disclosure and financial performance of insurance Companies and found that organizational performance (measured using return on assets) and financial information disclosure were positively correlated and that the model used was significant. This study however, shows a contextual gap as it focused on insurance companies whose findings may not be generalized for firms in the pharmaceutical sector.

Another study in Kenya by Magenda (2014) on the determinants of supply chain performance among commercial banks in Kenya showed that trust plays a fundamental role in strengthening the relationship between the organization and its suppliers to also build a good working relationship between the supply chain partners which contributes to organization performance. The study, however, presents a scope gap as it focused on commercial banks, while this study focused on pharmaceutical firms

Additionally, Wafula and George (2015) evaluated how strategic supplier collaborations affected organizational performance in Kenya Pipe Line company

and found that networking and communication channels were found to have improved between firm and its suppliers due to strategic supplier partnerships. This study shows a methodological gap since the authors did not use any inferential statistics to indicate the extent to which strategic supplier collaborations affected organizational performance. The current study employed correlation and regression analysis to show the relationship between collaborative planning and organizational performance.

Similarly, study by Berut (2020) on the Influence of Supply Chain Collaboration on Performance of Dairy Processing Firms in Kenya found that the dairy processing firms exploit supply chain information sharing, incentive alignment, teamwork and mediation dairy board policies and regulations which had a positive effect on firm performance. This study was done with focus on dairy processing firms thus showing a scope gap. The current study focused on firms in the pharmaceutical sector.

2.7 Summary of Literature Reviewed

The chapter looked at theoretical review, conceptual and empirical review. Under theoretical review, a number of theories relevant to the study were discussed. These theories included stakeholder theory, dynamic capabilities theory, systems theory, network theory, socio-technical systems theory and strategic choice theory.

The chapter also addressed the conceptual framework on which the study was anchored and the variables have been reviewed backed with literature. Finally, various studies with their results, methodology and critique were reviewed under empirical review with some studies indicating positive relationship between organizational relationships and performance while others indicating no relationship. Additionally, from the empirical review, the study was able to critique the relevant literatures and thereby isolate various research and knowledge gaps which formed the basis of this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

According to Kothari (2013) research methodology is a way to systematically solve a research problem. It may be understood as a science of studying how research is done scientifically. In it the researcher studied the various steps that were generally adopted in studying the research problem phenomenon along with the logic behind them**.** This chapter contains the research design, target population, sample size and sampling technique, data collection instruments, data collection procedure, analysis and presentation. In addition, the chapter contains the methods through which the measures of normality, hypothesis test and correlations between variables were carried out.

3.2 Research Philosophy

Scholars in social sciences assume that empirical research is dominated by two prime philosophies namely positivism and interpretivism or phenomenology (Crossan, 2003). According to Comte & bridges (1865) in both cases there is an attempt to discover factors which cause a phenomenon in the same way that scientists construct various theories to explain behavior of dependent variables. The positivistic philosophical approach is quantitative and is dominated by the process of hypotheses testing, with the intent of either rejecting or accepting the null hypothesis. This approach allows for the operationalization of various hypothetical concepts as well as generalization of the results (Comte & Bridges 1865)

The positivists believe that the world is external (Carlson et al., 1988) and that there is a single objective reality in each research regardless of the researcher's perspective (Hudson & Ozanne, 1988). Positivists therefore take a structured and controlled approach in conducting research by identifying a clear research topic, constructing appropriate hypotheses and then using a suitable research methodology (Churchill, 1996). Positivists remain detached from the participants, which is achieved by

creating a distance so that they can remain emotionally neutral so that they can make a distinction between their own feelings and reason (Carlson *et al*., 2001). In a positivist philosophy, a distinction between science and personal experience, the researcher maintains fact and value judgment. Positivism is based on values of reason, truth and validity. Positivists focus purely on facts gathered through direct observation and experience, measured empirically using the quantitative methods of survey and experiments (Saunders, Lewis & Thornbill, 2007; Erikspn & Kovalainen, 2008; Easterby, Smith, Thorpe & Jackson, 2008). Hatch and Cunliffe (2006) further relate positivism philosophy to organizational studies stating that positivists assume what truly happens in organizations as discovered through categorization and scientific measurement of people behavior, systems and language are true representation of reality.

On the other hand, interpretivism or phenomenological approach is qualitative in nature and focuses on the researcher's perception and relies on experience and avoids generalization based on existing theory (Comte & Bridges, 1865). This approach seeks to obtain data, analyze it and then make conclusions regarding the nature and strength of the relationship among the variables based on the empirical evidence (Comte & Bridges, 1865). Bhaskar (1998) introduces the two sides of knowledge, which are transitive and intransitive knowledge. Intransitive knowledge does not dependent on human activity while transitive phenomenon are artificial objects fashioned into items of knowledge by the science of the day.

The positivism philosophy was used in this study. This philosophy postulates that it is impossible to comprehend observations through measurements (Graton & Jones, 2010). This philosophy is flexible as it captures both the quantitative and qualitative research methods. It is also reliant on multiple data collection methods (Denzin & Lincoln, 2011). Post-positivism approaches accept that the natural sciences do not provide the only model for social research. The approach does not hold on the absolute truth and certainty but relies heavily on confidence. The study therefore employed positivistic philosophy which is based on objectivity, neutrality, measurement and validity of results.

3.3 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure or a conceptual structure within which research would be conducted (Kothari, 2014). This research adopted a descriptive research design to establish the influence of supply chain relationship management on performance of pharmaceutical firms in Kenya. According to Cooper & Schindler (2003), a descriptive study is concerned with finding out the what, where and how of a phenomenon. When the purpose happens to be an accurate description of a situation or of an association between variables, the suitable design is the one that minimizes bias and maximizes the reliability of the data collected and analyzed (Kothari, 2013). The data was collected through administration of the questionnaires to subjects with the relevant information and was analyzed through SPSS version 23.

3.4 Target Population

According to Mugenda & Mugenda (2003), population refers to an entire group of individuals, events or objects' having common observable characteristics. Population is a group of individuals, objects or items from which samples are taken for measurements. It refers to an entire group of persons or elements that have at least one thing in common (Kombo & Tromp, 2006). The target population of interest in this study were the 22 local pharmaceutical manufacturing and 149 importing firms that act as subsidiaries making a total of 171. Specifically, the study focused on pharmaceutical firms dealing with the human medicines as this sector is the largest and most advanced hence possess most relevant and accurate information for the study. Manufacturers and importing subsidiaries manage the actual distribution of drugs from manufacturing facilities to drug wholesalers, and in some cases, directly to retail pharmacy chains, and hospital chains. Table 3.1 shows the target population.

Table 3.1: Target Population

Company Type	Population Size	Target Population
Local Manufacturing Firms	22	22
Importing Firms	149	149
Total	**171**	**171**

Source: KAPI (2017)

3.4 Sampling Frame

The study sample was drawn from the list of 171 pharmaceutical firms. According to the Kenya Association of Pharmaceutical Industry (KAPI, 2017), there are 22 local manufacturing and 149 importing pharmaceutical firms in Kenya. The study adopted a census sampling technique where all items in the population were enumerated. In other words, census collects information from all units of the population. It is presumed that in such an inquiry, all items are covered and no element of chance is left and highest accuracy is obtained (Kothari, 2013). A census study occurs if the entire population is very small or it is reasonable to include the entire population. One questionnaire was administered to the supply chain manager in each firm giving a total of 171. The choice of supply chain managers is informed by the fact they form part of the top management involved in formulating strategic choices that inform strategies and relationships that firms want to establish with partners and customers. They were deemed knowledgeable enough because of their position and their responses could be relied upon in this research.

3.6 Data Collection Instrument

A questionnaire is a research instrument consisting of a series of questions and other prompts used for the purpose of gathering information from respondents (William *et al.,* 2013). Dempsey (2003) states that questionnaires are preferred for primary data gathering because they are not only effective data collection instruments that allow respondents to give much of their opinions pertaining the research problem, but also give them freedom to express their views or opinions more objectively. For this

study, a questionnaire was carefully designed, structured, based on the study objectives. Kothari (2008) states that information obtained from questionnaires is free from researchers bias which makes them ideal for positivist research approach. Each variable in the study formed its own sub-section in the questionnaire. The questionnaires consisted of both structured and unstructured questions. Structured questionnaires are those questionnaires in which there are definite, concrete and pre-determined questions. The questions were presented with exactly the same wording and in the same order to all respondents. In an unstructured questionnaire, the respondents were provided with a general guide on the type of information to be obtained, but the exact question formulation is largely his own responsibility and the replies were to be taken down in the respondent's own words to the extent possible.

3.7 Data Collection Procedure

Prior to the study a letter of introduction was obtained from the university and was presented to the management of various pharmaceutical firms so as to get access to employees with relevant information. The questionnaire was administered using the drop and pick method and control was exercised to ensure all questionnaires issued to the respondents were received by maintaining a register of questionnaires which were issued and which were received

3.8 Pilot Study

The questionnaire was pre-tested with a small sample for further improvements. This helped in enhancing validity and reliability of the data collected (cresswell, 2011). Pilot study is a feasibility study to find out if the research instrument designed for data collection will be suitable in the main study. According to Kothari (2014) before using a questionnaire for data collection, it advisable to conduct a pilot study for testing the questionnaires. Pilot study is in fact the replica and rehearsal of the main survey. Such a survey, being conducted by experts, brings to the light the weaknesses if any, of the questionnaire and also of the survey techniques (Sekeran, 2003).

3.8.1 Reliability Testing

Reliability refers to the internal consistency of the research instrument (Muhiyadin, 2015). The study employed Cronbach's alpha to verify the internal consistency of each construct in order to achieve reliability. The result of 0.7 and above implied acceptable level of internal reliability. A pilot study was useful in testing research instrument reliability. The respondents in the pre-test were not included in the actual research but this helped to evaluate the questionnaire in order to determine its clarity before it is administered to the respondents. Amendments to the questionnaire were also conducted to develop a final version of the questionnaire to be used in the survey. According to Mugenda & Mugenda (2003) 10% of the sample size is sufficient which translated to 17 respondents for this study. The respondents in the pilot study were not included in the final study to avoid response bias. The reliability of the 17 questionnaires was tested using SPSS 22.0. According to Cronbach (1951), items with an alpha coefficient of 0.7 were considered adequate for inclusion in the final questionnaire. The standard formula of the Cronbach alpha is:

$$\propto = \frac{N.C}{v + (N-1)c}$$

Where:

α=Cronbach Alpha

N = number of items

C bar = average inter items covariance among the items

V bar = average variance

Results

Variables	Cronbach Alpha	Number Of Items	Conclusion
Transparency	.0855	8	Reliable
Resilience building	0.769	8	Reliable
Collaborative planning	0.726	8	Reliable
Process alignment	0.864	8	Reliable
Inter-organization systems	0.807	8	Reliable
Performance of pharmaceutical firm	0.790	8	Reliable
Overall Cronbach Alpha	**4.811**	**48**	

3.8.2 Validity Testing

Validity is the degree to which an instrument measures what it claims to measure (Golafshani, 2013). Validity of instruments depends on the ability and willingness of the respondents to avail the information required (Sekaran & Bougie, 2009). Validity is the extent to which differences found within a measuring instrument reflect true differences among those being tested (Oppenheim, 2010). Content validity refers to the content or meaning of every measurement item which must be established prior to any theoretical measurement (Golafshani, 2013). Expert judgment can be used to enhance content validity through identifying weaknesses and trying to correct (Best & Kahn, 2011). A pre-test of questionnaire was conducted to establish content validity through giving first draft of questionnaires to a panel of 10 experts in the field of supply chain. The experts were asked to review the instrument and make recommendations for improving its validity. The feedback collected was used to adjust or modify the questionnaire accordingly to improve the level of clarity.

3.9 Data Analysis and Presentation

The data was analyzed using SPSS version 22 by making use of multiple regression analysis which helped to generate a weighted estimation equation (OLS) that was used to predict values for dependent variable from the values for several independent variables. The data was cleaned, coded, categorized per each research variables and then analyzed using descriptive analysis such as frequency tables, percentages and mean. Qualitative data was analyzed on the basis of common themes and presented in a narrative form. Linear regression analysis was applied to show the relationship between variables. The regression model was as below:

$$Y=\beta_0+ \beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+\varepsilon$$

Where:

γ=Performance of Pharmaceutical firms

$\beta 0$=Constant of Regression

X_1=Transparency

X_2=Resilience Building

X_3=Collaborative Planning

X_4=Process Alignment

$\beta_1, \beta_2, \beta_3, \beta_4$ = Beta coefficients and

ε=Error Factor

Pearson correlation was used to test the association and strength of the variables at the significance 0.05, while the goodness of fit were tested using ANOVA on how variables were fitting. The regression co-efficient was used to test the relationship between independent variables and the dependent variable at 0.05 level of significance. The joint significance of all the independent variables were tested based on overall effect on the dependent variables. The findings were presented using tables since tables are user friendly and show response frequencies as well as

percentages of respondent's opinions on the influence of supply chain relationship management on the performance of pharmaceutical firms.

The regression model for the moderator was as follows:

$$Y=\beta_0+ \beta_1X_1*M+ \beta_2X_2*M + \beta_3X*M_3+ \beta_4X_4*M +\varepsilon$$

Where M is the moderator.

3.9.1 Hypothesis Testing

For this study, the hypothesized relationships were tested using F-test by comparing the P value, or calculated probability at 0.05 level of significance. If the P value is found to be less than or equal to α, significance level α= 0.05, then the null hypothesis should be rejected. If the p-value is greater than α=0.05, then H_0 was not rejected. The lower the P-value, the more evidence there is in favor of rejecting the null hypothesis.

3.9.2 Test for Normality

A test for normality was conducted to test the probability that the sample was drawn from a normal population. Statistical tests for normality are more precise since actual probabilities are calculated (Habib *et al.,* 2014). So, when testing for normality: Probabilities > 0.05 mean the data are normal. Probabilities < 0.05 mean the data are not normal. In order to test for normality in this study Kolmogorov-Smirnov and the Shapiro-Wilk tests were used since they are more reliable test for determining skewness and kurtosis values of normality. Large probabilities in this study were taken to denote normally distributed data.

3.9.3 Test for Multicollinearity

Multicollinearity is unacceptable high level of intercorrelation among independent variables such that the effects of independents cannot be separated. If there is a high degree of correlation between independent variables, we have a problem of multicollinearity. If there is a multicollinearity between any two predictor variables,

then the correlation coefficient between these two variables were near to unity. In such a situation only one set of the independent variable is used to make an estimate (Kothari, 2014). Under multicollinearity, estimates are unbiased but assessment of the relative strengths of the explanatory variables and their joint effects are unreliable (Habib *et al.,* 2014). Large correlation coefficients in the correlation matrix of predictor variables indicate multicollinearity. High multicollinearity is signaled when high R-squared and significant F-test of the model occur in combination with non-significant t-tests of the co-efficient. None of the t-ratios for the individual coefficients is statistically significant, yet the overall F statistic is. If the absolute value of Pearson correlation is greater than 0.8, or close to 0.8 (such as 0.7±0.1), collinearity is likely to exist. In this case one of the collinear variables is removed.

3.9.4 Test for Heteroscedasticity

Heteroscedasticity is present when the size of the error term differs across values of an independent variable. The impact of violating the assumption of homoscedasticity was a matter of degree, increasing as heteroscedasticity increased (Habib *et al.,* 2014). For ordinary least squares; it was assumed that the error terms of the model had constant variance and that they are mutually uncorrelated. To test for heteroscedasticity in this study, plots of the least squares residuals and their squares as well as scatters of these variables against explanatory variables or against the fitted values were made.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis, research findings and interpretation. The data was analyzed to generate descriptive findings which are presented here in form of tables. The analyzed data was arranged under themes that reflected the research objectives of various variables under study. Various tests were conducted before conducting correlation and regression analyses which included: hypotheses tests, normality test, multicollinearity and heteroscedasticity tests. Factor analysis was also conducted to show the factor loadings in order to carry out further analysis. The inferential statistics used are correlation analysis and regression analysis to show the relationship between the dependent and independent variables.

4.2 Response Rate

The study adopted a census research design where all study subjects were enumerated. Therefore, the number of questionnaires distributed to respondents was 171 in tandem with sample frame. Out of the 171 questionnaires, 134 were correctly, fully filled and returned. This presented a response rate of 78% which according to Kothari (2011) is appropriate for analysis; while 37 questionnaires were either never filled at all by respondents or not returned and could not be raced representing 22% of the questionnaires. The results are as presented in table 4.1

Table 4.1: Response Rate

Questionnaires	**Frequency**	**Percentage (%)**
Responsive	134	78
Non-Responsive	37	22
Total	171	**100**

4.2.1 Response by Gender

Respondents were asked to indicate their gender. With respect to response rate by gender, 52% of the staff in the sampled pharmaceutical firms were male while only 48% were female. These findings agree with those of Karanja (2009) that most employees of pharmaceutical firms in Kenya are male (52%) enhancing the compliance with the 1/3 gender rule. Though there are more men than women in pharmaceutical firms, the gap between the two genders is not significant and therefore a fair gender mix in the pharmaceutical sector is healthy for sustained performance of the sector. The gender distribution in the study was presented in figure 4.1 below.

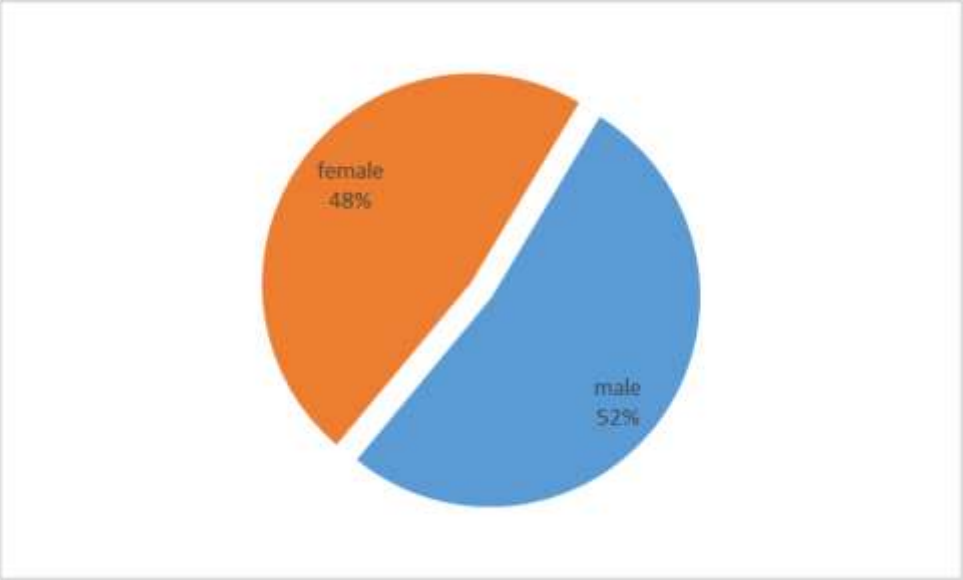


Figure 4.1: Respondents Distribution by Gender

4.2.2 Response by Years of Work in the Company

The respondents were asked to indicate their working years at the company. According to the results, 52% o of the respondents have been at the company for 5 to 10 years, 40% have been working in their company for less than 5 years, while only 8% of the respondents have worked for more than 10 years. With a total of 60% of respondents having worked for the company for more than 5 years, the data collected is valid and credible since an employee working constantly in a specific area gains

invaluable experience and specialization in the long run. Most of the respondents therefore are therefore aware of the firm's operation and have adequate customer experience. The response by the number of years worked in the company were presented in figure 4.2 below.

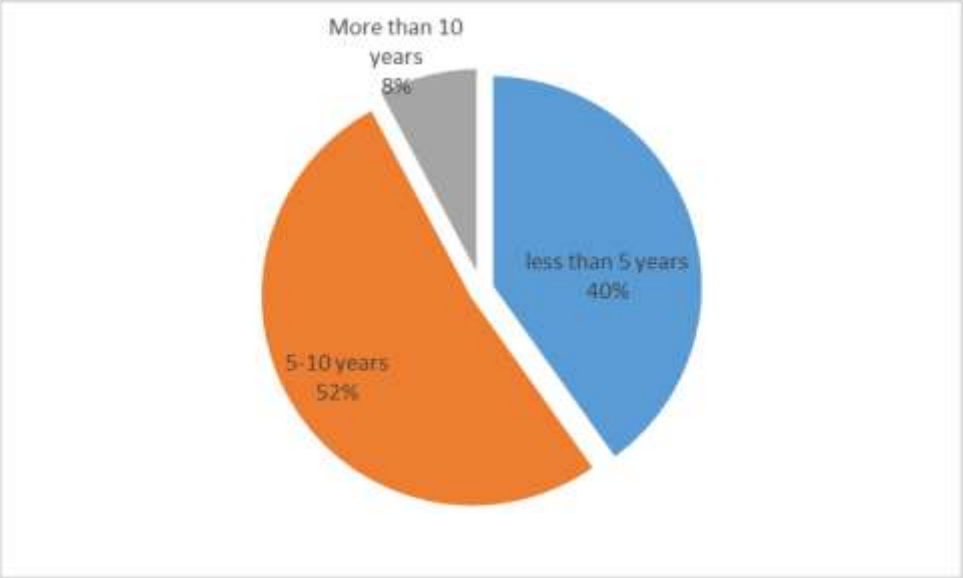


Figure 4.2: Respondents Distribution by their Years of Work

4.2.3 Years of Firm Operation

The respondents were asked to indicate the number of years that their corresponding firms had been in operation. From the findings, 56% of the studied firms had been in operation for over 20 years, 31% had been in operation for between 10 and 20 years while 13% been in operation for less than 10 years. This implies that the firms have been in operation for adequate period of time to sufficiently depict the relationship between supply chain relationship management practices and organizational performance. The results are as shown in figure 4.3.

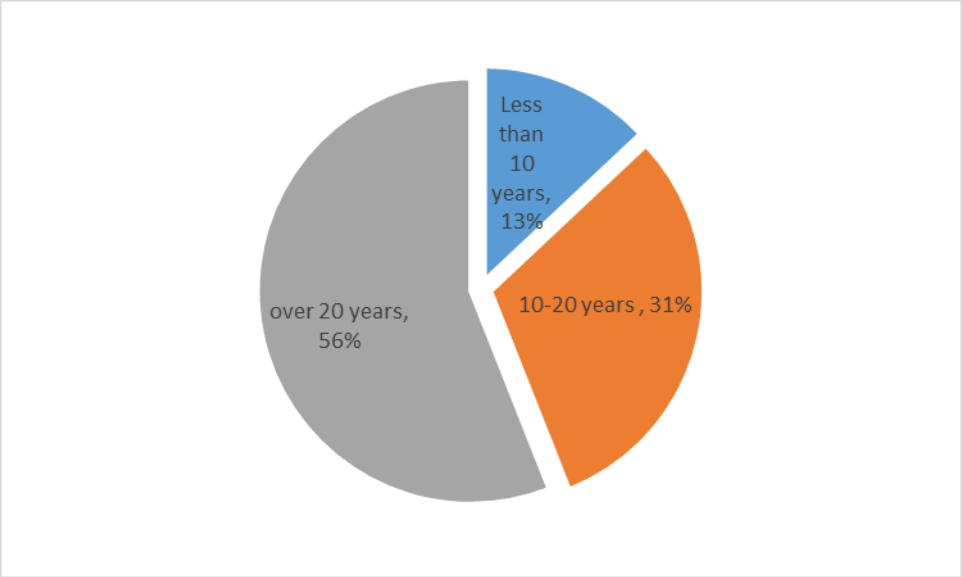


Figure 4.3: Years of Firm Operation

4.3 Pilot Study Results

A pilot study was conducted to test for validity and reliability of the data collection instrument. Pilot study was used to detect weaknesses in research design and instrumentation and to provide proxy large scale studies data for selection of the sample (Cooper & Schindler, 2006). To test that the research instrument was valid and reliable; the study undertook a pre-test study by administering questionnaires to 17 supply chain managers which were properly filled and returned. According to Mugenda and Mugenda (2013), the pre-test sample is normally between 1% and 10% depending on the sample size. Pretesting helped to assess the clarity of the instrument, the ease of use and the time taken to administer the instruments.

4.3.1 Reliability Results

Reliability refers to the consistency, stability or dependability of the data (Cooper & Schindler, 2003). Reliability analysis was done to evaluate survey construct using Cronbach's alpha. The most common reliability coefficient is Cronbach's alpha which estimates internal consistency by determining how all items on a test relate to all other items and to the total test- internal coherence of data, expressed as a coefficient between 0 and 1.00. The higher the coefficient, the more reliable is the

test (Bagozzi, 1994). Whenever an investigator measures a variable; he or she wants to be sure that the measurement provides dependable and consistent results (Cooper & Schindler, 2003). Reliability in research is influenced by the degree of error (Kothari, 2010). A measuring instrument is reliable if it provides consistent results (Kothari, 2014). As random error increases, reliability decreases (Mugenda, 2013).

In order for results to be usable in further research steps, they must be reliable and valid. Castillio (2009) provide the following rules of thumb: >0.9 – Excellent, >0.8 – Good, >0.7 – Acceptable, >0.6 – Questionable, >0.5 – Poor and <0.5 – Unacceptable. The acceptable value of 0.7 was used as a cut off of reliability for this study. The pilot study was highly reliable with Cronbach Alpha for the results being 0.855, 0.769, 0.726, 0.864, 0.790 and 0.80 for Transparency, resilience building, collaborative planning, process alignment, inter-organization systems and performance respectively. Sekaran and Bougie (2013) argued that coefficient greater than or equal to 0.7 is acceptable for basic research. The table 4.2 shows the reliability results for the pilot study

Table 4.2: Reliability Results

Variables	**Cronbach Alpha**	**Number Of Items**	**Conclusion**
Transparency	.0855	8	Reliable
Resilience building	0.769	8	Reliable
Collaborative planning	0.726	8	Reliable
Process alignment	0.864	8	Reliable
Inter-organization systems	0.807	8	Reliable
Performance of pharmaceutical firm	0.790	8	Reliable
Overall Cronbach Alpha	**4.811**	**48**	

4.3.2 Validity Results

The Bartlett test of sphericity is a statistical test used to verify that variances are equal across groups or samples. It checks that the assumption of equal variances is true before running certain statistical tests. On the other hand, the Kaiser-Meyer-

Olkin Measure of Sampling Adequacy is a statistic that indicates the proportion of variance in your variables that might be caused by underlying factors. High values (close to 1.0) generally indicate that a factor analysis may be useful with your data. If the value is less than 0.50, further inferential tests can be conducted. . A chi-square test for independence compares two variables to see if they are related. In a more general sense, it tests to see whether distributions of variables differ from each another. A very large chi square test statistic means that your observed data fits your expected data extremely well. In other words, there is a relationship. A very small chi square test statistic means that the data does not fit very well. In other words, there isn't a relationship. In statistics, the number of degrees of freedom is the number of values in the final calculation of a statistic that are free to vary

The findings in table 4.3 indicated that the KMO values were greater than 0.5 implying that the results of factor analysis would be relevant. Additionally, the the Bartlett's test of sphericity results shows that the corresponding p values are less than 0.5 implying that there are equal variances in the variables.

Table 4.3: Results for Construct Validity

Measure		**Inter-organization information systems**	**Transparency**	**Resilience Building**	**Collaborative Planning**	**Process Alignment**	**Organizational Performance**
Kaiser-Meyer-Olkin values		**0.731**	**0.712**	**0.768**	**0.7837**	**0.745**	**0.822**
Bartlett's Test of Sphericity	Approx. Chi-Square	102.219	114.196	90.621	119.340	131.005	110.021
	Df.	15	15	15	15	15	15
	Sig.	**0**	**0**	**0**	**0**	**0**	**0**

4.4 Diagnostic Tests

Diagnostic tests are tests conducted to determine the appropriateness of the data prior to conducting inferential analysis. The relationship between the dependent and the independent variables should satisfy the assumption of normality, heteroscendasticity, linearity and multi-collinearity. Before conducting the regression

analysis; it is advisable to conduct several diagnostic tests to establish the appropriateness of the data for making inference. The researcher subjected the collected data to normality, multi-colinearity and heteroscendasticity tests and the results presented in tables and figures.

4.4.1 Test for normality

Tests for normality is used to depict or calculate the probability that the sample was drawn from a normal population. Statistical tests for normality are more precise since actual probabilities are calculated (Habib *et al.,* 2014). There are several ways of testing normality including; Chi-square, histogram for physical examination, skewness and kurtosis values of normality as well as Kolmogorov-Smirnov and the Shapiro-Wilk test. Kolmogorov-Smirnov statistic for non-parametric distribution is an excellent test that provides a means of testing whether a set of observations are from a continuous distribution. The Kolmogorov-Smirnov test has two major advantages over the chi- square test because it can be used with small sample sizes, where the validity of the chi- square test would be questionable and is more powerful test than the chi-square test for any sample size (Mehmet (2003).

The test for normality, developed by Shapiro & Wilk (1965) is the most powerful and omnibus test in most situations (D'Agostino & Stevens, 1986). In recent years, the Shapiro-Wilks test has become the preferred test of normality because of its good power properties as compared to a wide range of alternative tests (Shapiro *et al.,* 1968). For the purpose of this study, Kolmogorov-Smirnov and the Shapiro-Wilk tests were used since they are more reliable test for determining normality and has been found to be the most powerful test in most situations (Richardson & Smith, 1993). The rule of thumb is that if the significance level is >0.05, we assume that the data is normally distributed and if less than 0.05, we assume that the data is not normally distributed. The test is not calculated when a frequency variable is specified. It is mostly used for evaluating the assumption of univariate normality by taking the observed cumulative distribution of scores and comparing them to the theoretical cumulative distribution for a normally distributed variable. The rule is

that if the p-value is greater than 0.05, H_0 is rejected and H_1 is accepted. The tests results are as shown in Table 4.4.

Table 4.4: Kolmogorov-Smirnova and Shapiro-Wilk Test

	Kolmogorov-Smirnova			Shapiro-Wilk		
Variables	**Statistic**	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Performance	0.115	269	0.295	0.970	269	0.070
Process alignment	0.103	269	0.310	0.956	269	0.067
Collaborative planning	0.114	269	0.209	0.955	269	0.871
Resilience building	0.117	269	0.067	0.966	269	0.456
Transparency	0.131	269	0.059	0.951	269	0.657
Inter- organization systems	0.107	269	0.133	0.946	269	0.521

4.4.2 Test for Heteroscendasticity

Heteroscedasticity is usually present when the size of the error term differs across values of an independent variable (Fletcher, *et al.,* 2000). Heteroscedasticity is indicated when the residuals are not evenly scattered around the line. When the plot of residuals appears to deviate substantially from normal, more formal tests for heteroscedasticity should be performed (Jason 2013). The error process may be Homoscedastic within cross-sectional units, but its variance may differ across units: a condition known as group wise Heteroscedasticity (Stevenson, 2004). For the purpose of testing heteroscendasticity in this study, Breusch Pagan Test was performed inorder to calculate group wise Heteroscedasticity in the residuals. Heteroscedasticity test was run in order to test whether the error terms are correlated across observation in the panel data (Long & Ervin, 2000). As a rule of thumb, if the p value is less than 0.05, the data has the problem of heteroscedasticity. The results revealed that all the variables had a p value > 0.05. Thus the data did not suffer from heteroscedasticity.

Table 4.5: Heteroscedasticity Test

Variables	β	Std. Error	T	Sig.
(Constant)	0.209	0.718	0.291	0.771
Transparency	-0.143	0.065	-1.197	0.063
Resilience Building	0.247	0.075	1.290	0.071
Collaborative planning	0.161	0.092	1.743	0.084
Process alignment	0.077	0.067	1.160	0.248
Inter-organization systems	-0.125	0.072	-1.733	0.085

4.4.3 Multicollinearity Test

According to William *et. al*, (2013) multicollinearity refers to the presence of correlations between the predictor variables. In severe cases of perfect correlations between predictor variables, multicollinearity implies that a unique least squares solution to a regression analysis cannot be computed (Field, 2009). Multicollinearity inflates the standard errors and confidence intervals leading to unstable estimates of the coefficients for individual predictors (Belsley, *et al.*, 1980). Multicollinearity was assessed in this study using the Variance Inflation Factors (VIF) and the results presented in table 4.12. According to Field (2009) VIF values in excess of 5 is an indication of the presence of Multicollinearity. The variance inflation factor results were established to be 1.3548 which is less than 5 and thus according to Field (2009) there is no Multicollinearity.

Table 4.6: Multicollinearity Results Using Variance Inflation Factor (VIF)

Variables	Tolerance	VIF
Transparency	0.794	1.259
Resilience building	0.717	1.394
Collaborative planning	0.660	1.516
Process alignment	0.743	1.346
Inter-organization systems	0.794	1.259
Mean		**1.3548**

4.4.4 Hypotheses Testing

Hypothesis testing is comparing a hypothesis with the null hypothesis. The null hypothesis is only rejected if its probability falls below a predetermined significance level, in this case 0.05, in which case the hypotheses being tested is said to have that level of significance. Hypotheses testing was done through F-test and acceptance/rejection criteria was that if the F-calculated was greater than the F-critical, then the null hypothesis is rejected indicating a positive and significant relationship between the study variables at 0.05 level of significance. The results for hypothesis testing are as shown in table 4.13

Table 4.7: Hypotheses Test

Null Hypothesis	F-Calculate	F-critical	P value	Conclusion
$H_0$1: There is no significant positive influence of Transparency on performance of pharmaceutical firms in Kenya	4.209	2.19	0.000	The null hypothesis was rejected indicating a significant relationship between Transparency and performance of pharmaceutical firms in Kenya. This was because the calculated F value was greater than the critical F value and the corresponding p value was less than 0.05.
$H_0$2: There is no significant positive influence of resilience building on performance of pharmaceutical firms in Kenya	4.256	2.19	0.000	The null hypothesis was rejected, indicating a significant relationship between resilience building and performance of pharmaceutical firms in Kenya. This was because the calculated F value was greater than the critical F value and the corresponding p value was less than 0.05.
$H_0$3: There is no significant positive influence of collaborative planning on performance of pharmaceutical firms in Kenya	42.628	2.19	0.000	The null hypothesis was rejected, indicating a significant relationship between collaborative planning and performance of pharmaceutical firms in Kenya. This was because the calculated F value was greater than the critical F value and the corresponding p value was less than 0.05.
$H_0$4: There is no significant positive influence of process alignment on performance of pharmaceutical firms in Kenya.	45.177	2.19	0.000	The null hypothesis was rejected, indicating a significant relationship between process alignment and performance of pharmaceutical firms in Kenya. This was because the calculated F value was greater than the critical F value and the corresponding p value was less than 0.05.
$H_0$5: inter-organization systems do not have a moderating effect on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya	31.541	2.19	0.000	The hypothesis was rejected hence there is a moderating effect of inter-organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. This was because the calculated F value was greater than the critical F value and the corresponding p value was less than 0.05.

4.5 Descriptive Analysis of the Study Variables

Descriptive statistics helps describe, show or summarize the data in a meaningful way from the patterns that might emerge without helping the researcher make conclusions beyond the analyzed data or test any of the study hypotheses. The main purpose of descriptive analysis of the findings is to describe the main features of the data

(Young, 2013). Descriptive analysis of the data provides simple summaries about the sample and the measures used and together with simple graphical analysis and presentation; they form the basis of every quantitative analysis of data (Cooper, 2015). It is hard to visualize the meaning of raw data and descriptive enable us to present data in a more meaningful way through statistics and graphs. The common descriptive are the measures of central tendency which is the mean, mode and median while the measure of spread deals with ranges, quartiles, standard deviations and variances.

4.5.1 Influence of Transparency on organizational Performance

The respondents were asked to respond on the statements relating to the Transparency and results were presented on the table 4.4. From the results, majority of the respondents indicated that the firms extend credit facilities (mean=3.94). This statement is line with Houcine, (2015) findings that transparency is a risk-taking behavior or a willingness to engage in risk taking actions. Gaurav *et al.,* (2013) also found that extending credit facilities has a significant influence on firm profitability, while majority of the respondents agreed that their firms share market information (mean=3.98) in line with Dino *et al.,* (2016) explanation that the existence of transparency promote knowledge and information sharing thus fostering organizational performance.

The findings also are also articulated by Evangelia & Robert (2018) that transparency assists in resolving the paradox of inter-organisational relationships where partners can also be competitors by enabling partners to exchange sensitive information thus promoting interactions and commitment. Further, the results revealed that 77.33% of the respondents strongly agreed that their firms regularly conduct customer audits with the mean responses being 3.98 implying that majority of the respondents agreed with the statements. This in line with Luo & Yu, (2016) and Zimmermann *et al.,* (2016) that many firms trust their supply chain (SC) partners for innovative strategies which require that the partners be aligned with other actors in the SC by sharing the same innovation strategy (Flynn (2016). Additionally, the results revealed that 71.37% of the respondents agreed on the statement that their firm involve customers in risks management (mean=3.91) which is in line with the

findings of Dino *et al.,* (2016) that trust improves performance, minimizes perceived risk, helps build teams and relationships, improves cooperation, improves communication and minimizes conflicts.

In addition, 75.83% of the respondents confirmed that their firm easily resolved customer conflict (mean=3.99) and agree with Mei-Ying *et al.,* (2012) that solving customer conflicts leads to customer loyalty and subsequently improved organizational performance. The finding also agree with Marek *et al.,* (2019) statement that trust enables the rapid exchange of inter-firm resources needed to develop innovative capabilities and gain competitive advantage in a dynamic marketplace. Many of the respondents 72.86% agreed that their firm coordinate with their customers (mean=3.98) in line with Houcine, (2015) findings that during the expansion phase, trust is built through repeated transactions and partners are more willing to engage each other in open communication and show greater behavioral transparency while 73.98% of the respondents indicated that their firms' response was timely (mean=3.9), a finding supported by Emanuela, (2012) who found that timely delivery of services leads to customers trust towards the firm and thus improved performance. Moreover, 78.81% of the respondents agreed that their firm has built loyalty (mean=4.07) and is supported by Kamel *et al.,* (2016) and Dick (2014) findings that there are two important aspects of bilateral communication which include information exchange and sharing and the degree of openness in information exchange between partner. On a five-point scale, the average mean of the responses was 3.95 which meant that the majority of the respondents agreed with the statements that transparency in a partner play a role in maintaining the relationship, and consequently profitability; however the answers were varied as shown by a standard deviation of 0.93625.

Table 4.8: Descriptive Results for Transparency

Statement	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	Standard Deviation
Our firms extend credit facilities	4.09%	8.18%	13.01%	44.61 %	30.11%	3.88	1.06
We share market information	1.49%	7.06%	18.96%	41.64 %	30.86%	3.93	0.96
We regularly conduct customer audits	1.86%	7.06%	13.75%	46.10 %	31.23%	3.98	0.95
We involve customers in risks management	1.49%	7.43%	19.70%	40.89 %	30.48%	3.91	0.96
Our firm resolve customer conflict	0.74%	3.72%	19.70%	47.21 %	28.62%	3.99	0.84
We coordinate with our customers	0.00%	6.32%	20.82%	41.26 %	31.60%	3.98	0.88
our firm response is timely	1.86%	9.29%	14.87%	44.98 %	29.00%	3.9	0.99
our firm has built loyalty	0.37%	4.83%	15.99%	44.61 %	34.19%	4.07	0.85
Average						**3.95**	**0.93**

4.5.2 Influence of Resilience Building on organizational Performance

The respondents were asked to rate the extent to which they agreed with statement in the questionnaires and the results presented in table 4.5 where 74.35% of the respondents indicated large extent on the statement about how quickly their firm adapts to new customer requirements (mean=3.94). These findings agree with Waqar *et al.,* (2019) that resilience enables a firm to build capability to respond effectively and rapidly in any market situation. Through acquiring agile capabilities, firms move towards differentiation giving them an edge over their competition in any uncertain situation, thus agility plays a vital role in achieving competitive advantage (Wu *et al.,* 2017). The findings were in line to those Stefan *et al.,* (2019) which asserted that quick adaptation to new customer requirements is essential in business operation and performance of the company.

The results also found out that 74.35% of the respondents rated large extent on the statement about their firm's preparation to deal with supply disruptions(mean=3.98) which is in line with the findings of Fayezi et al. (2017)) that resilience involves responding quickly when a change occurs in demand in terms of variety and volume

(Chan *et al.*,2017). Further, the results revealed that 76.21% of the respondents indicated that their firm has invested in building visibility to a larger extent (mean=3.99) consistent with the Braunscheidel and Suresh, (2018) and Eckstein *et al.,* (2015) findings that resilience is focused on customer service and responsiveness toward customer demand or requirements and Sinha et al. (2015) that through responsive supply chain, an organization can focus more on competitive conditions and unpredictable actions, such as natural disasters, unexpected demand changes, rapidly innovation in technology and requirements for joint suppliers, which are also amongst the most difficult issues to viably deal with in the global supply chain

Further 75.84% of the respondent indicated that the firm has stable and assured and supply (mean=4.01) which is in line with the findings of Tejpal (2014). Many 76.58% of the respondents indicated that their firm is flexible to customer requirements to a larger extent (mean=3.97) which is consistent with Dubey *et al.,* (2018) and Najmi & Khan, (2017) that flexibility enables firms to internally enhance competency and adaptability of an organization inside supply chain functions including purchasing, production and supply. Additionally, 73.6% of the respondents indicated that their firm was alert to new customer demands (mean=3.99) while 71.38% of the respondents indicated a large extent on firm's response to unanticipated customer needs in time (mean=3.99) which is in line with Fayezi et al. (2015) explanation of agility component of resilience where firms have built flexibility in their system to cope in a timely manner with the market turbulence or the capability of a firm to successfully respond to disturbances in the supply chain (Fayezi *et al.*, 2017). The results also revealed that 76.95% of the respondents agreed on a larger extent that their firms are innovative to new preferences (mean=4.04) consistent with Dubey *et al.*, (2018); Najmi and Khan, (2017) that resilience focuses on externally intensive competency that includes quick market responsiveness, introduction of new products, speed, reduction of time and distribution consistency as well as Fayezi (2015) whose study reported positive results on firm innovative to new customer preferences. On a five point scale, the average mean of the responses was 3.98 which implies that the majority of the respondents agreed to a large extent

with statements; however the answers were varied as shown by a standard deviation of 0.87.

Table 4.9: Descriptive Results for Resilience Building

Statement	no extent	small extent	moderate extent	large extent	very large extent	Mean	SD
we adapts quickly to new customer requirements	1.12%	5.20%	19.33%	47.21%	27.14%	3.94	0.88
Our firm is always prepared to deal with supply disruptions	1.12%	4.46%	20.07%	43.87%	30.48%	3.98	0.89
Our firm has invested in building visibility	0.74%	5.95%	17.10%	46.47%	29.74%	3.99	0.88
Our firm has stable and assured supply	1.49%	5.58%	17.10%	42.38%	33.46%	4.01	0.93
Our firm is flexible to customer requirements	0.37%	2.97%	20.07%	52.79%	23.79%	3.97	0.77
Our firm is alert to new customer demands	0.74%	5.95%	19.70%	41.26%	32.34%	3.99	0.91
We respond to unanticipated customer needs in time	0.00%	4.83%	23.79%	47.96%	23.42%	3.9	0.81
Our firm is innovative to new preferences	0.00%	6.32%	16.73%	43.12%	33.83%	4.04	0.87
Average						**3.98**	**0.87**

4.5.3 Influence of Collaborative Planning on organizational Performance

The descriptive on collaborative planning and performance of the pharmaceutical firms in Kenya is presented in Table 4.6 which suggest that 74.34% of the respondents agreed that the firm collaborate with customers in new product development (mean=3.97). These findings are consistent with Daniel *et al.*, (2019) who found out that Information such as purchase order information, planned orders, inventory levels, product design specifications, production planning, supply chain performance, demand forecast, overhead cost structure and ability to grow are some vital information that can be shared to aid planning.

Additionally, the results showed that majority 74.73% of the respondents agreed that firms involve customers in forecasting (mean=3.98). The statement is in line with Farhad *et al.*, (2018) findings that Supply chain collaboration through information

sharing platforms such as CPFR and VMI provide benefits to trading partners from various aspects such as improvement of forecasting accuracy, improved customer service quality and stronger relationship between partners. The findings are also in tandem with Yandar, (2019). Customer integration and collaboration reflects close information-sharing activities with key customers that provide the firm with strategic insights into the market expectations and opportunities while 71.75% of the respondents indicated that the firm had joint execution schedules (mean=3.87). This agrees with Stefan *et al.,* (2019) who stated that informal controls such as shared problems solving can reduce s information asymmetries between collaborating partners leading to enhanced performance (Yung & rim-rem,2019).

The research also revealed that 67.29% of the respondents agreed that firm has collaboratively installed a common IT system (mean=3.75). The findings agree with Daniel *et al.,* (2019) that IT tools such as PCs, laptops, data and voice networks and communications applications including e-mails play a critical connectivity role in facilitating the exchange of information to and from supply chain members involved in joint collaboration efforts and are instrumental in collaborative innovation efforts. Further, 69.89% of the respondents indicated that their firms' involve customers in stock replenishments while 71.38% of the respondents indicated that they have joint project teams with customers (mean=3.87). This is well in agreement with Stefan *et al.,* (2019) who further argued that collaborative relationship leads to inter-organizational controls such as joint problem solving.

Many 63.94% of the respondents agreed that their firms involve customers in planning marketing activities (mean=3.83) and 64.69% of the respondents agreed the statement that their firm share financial resources (mean=3.7). These findings are in line with Yandra *et al.,* (2019) who stated that supply chain collaboration is characterized by its suitability, connectedness and coordination of people, processes, information, knowledge and strategy. Stevens and Johnson, (2016) found that collaboration planning influenced the performance of the firms in retail industry. This is well explained by Flynn *et al.,* (2016) who premised that focal organizations reduce uncertainty through collaborating and controlling the materials and information between the members of supply chain in order to respond to rapidly

changing conditions. On a five-point scale, the average mean of the responses was 3.84 which imply that majority of the respondents agreed with the statements; however, the answers were varied as shown by a standard deviation of 0.96.

Table 4.10: Descriptive Results for Collaborative Planning

Statement	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree	Mean	SD
we collaborate in new product development	0.74%	4.83%	20.07%	45.72%	28.62%	3.97	0.87
We involve customers in forecasting	0.74%	6.32%	18.22%	43.87%	30.86%	3.98	0.9
We have joint execution schedules	1.12%	5.95%	21.19%	47.96%	23.79%	3.87	0.88
We have a common IT system	3.35%	10.41%	18.96%	42.75%	24.54%	3.75	1.05
We involve customers in stock replenishments	2.23%	6.69%	21.19%	42.01%	27.88%	3.87	0.97
We have joint project teams with customers	1.49%	8.18%	18.96%	48.33%	23.05%	3.83	0.93
We involve customers in marketing activities	2.23%	8.55%	25.28%	36.43%	27.51%	3.78	1.01
Our firm share financial resources	2.97%	11.90%	20.45%	42.01%	22.68%	3.7	1.04
Average						**3.84**	**0.96**

4.5.4 Influence of Process Alignment on organizational Performance

The respondents were requested to indicate their extent of agreement to various process alignment statements. From the findings, 69.52% of the respondents indicated large extent on the statement about their firms' strategic objectives is compatible with customers (mean=3.77). The findings are in tandem with Sardana *et al.*, (2016) that poses that communication, exchanging ideas among different functional divisions will create an active learning and knowledge creation environment towards the strategic alignment of manufacturing, marketing and other functions for better organizational performance. The findings are also were in line to those of Ramis (2016) who asserted that compatibility of strategic objectives with customers is essential in business operation and performance of the company.

The results also found out that 65.43% of the respondents rated large extent on the statement about their firms relational behavior compatibility to the customers (mean=3.76) which is line with the findings of Maria and Panagiotis, (2019) that information transparency and synchronized processes across supply chain members to increase service levels, maximize profit and respond in real time in dynamic situations. Further, the results revealed that 67.29% of the respondents indicated that their firm performance is acceptable to customers to a larger extent (mean=3.77) consistent with Maria and Panagiotis, (2019) that aligned processes is characterized with performance aspects of product tracking, information transparency, reduction of the bullwhip effect, inventory accuracy, improvement of product life cycle management, labor cost reduction and flexibility. This also agree with Um *et al.,* (2018) posit that there is need of Aligning product variety with supply chain and business Strategy and enterprise's strategy should be thoughtfully matched and aligned, so that it can be pursued with clarity and consistency for better performance. This means that either a high product variety and high customization potential strategy of innovative product differentiation, focused customer service and supply chain agility is followed (Um *et al,.* 2018). In addition, 68.28% of the respondent indicated that the firm management styles are compatible (mean=3.76) which is in line with the findings of staefan, (2019) that deeply shared understandings result from a consensus making and socialization process in which the actors agree on appropriate norms, values, and behaviors which lead to improved performance. Many (65.80%) of the respondents indicated that their firm delivery standards are acceptable to a larger extent (mean=3.86) which is consistent with the suggestions by Al-Shboul (2017) that continued and unpredictable changes in the environment leads the firm to speed up its response to change and responsiveness to the customer needs hence performance.

Additionally, 71.00% of the respondents indicated that their firm marketing activities are satisfactory (mean=3.86) indicating an agreement with Aboobucker *et al.*, (2019) that firms that target customer intimacy should have the tightest business and IT alignment in customer relations, sales and marketing business processes. 70.26% of the respondents indicated a large extent on firm's provision of satisfactory product characteristics (mean=3.94) which is consistent with Fantazy and Salem, (2016) that

if alignment is effective, it should lead to an improvement in performance. The results also revealed that 67.66% of the respondents agreed on a larger extent that their firms' data exchange with customers is acceptable (mean=3.82). These findings are in line with Aboobucker *et al.*,(2019) that the better the IT–business strategy alignment, the superior the firm performance will be. On a five point scale, the average mean of the responses was 3.81 which implies that the majority of the respondents agreed to a large extent with statements; however the answers were varied as shown by a standard deviation of 0.97.

Table 4.11: Descriptive Results for Process Alignment

Statement	no extent	small extent	moderate extent	large extent	very large extent	Mean	SD
Our strategic objectives are compatible with customers	2.23%	8.55%	19.70%	48.70%	20.82%	3.77	0.95
Our relational behavior is compatible to customers	0.74%	8.92%	24.91%	44.61%	20.82%	3.76	0.91
Our performance is acceptable to customers	2.23%	10.04%	20.45%	42.75%	24.54%	3.77	0.9
Our management styles are compatible	1.12%	14.55%	16.04%	44.03%	24.24%	3.76	1.02
Our delivery standards are acceptable	2.23%	7.43%	24.54%	33.83%	31.97%	3.86	1.02
Our firm marketing activities are satisfactory	1.86%	7.81%	19.33%	44.98%	26.02%	3.86	0.96
We provide satisfactory product characteristics	0.37%	6.69%	22.68%	39.03%	31.23%	3.94	0.92
Data exchange with customers is acceptable	2.23%	8.92%	21.19%	39.78%	27.88%	3.82	1.01
Average						**3.81**	**0.97**

4.5.5 Moderating Effects of Inter-Organizational Systems between Relationship Management practices and organizational Performance

Further data was collected from the respondents who were requested to indicate their extent of agreement to various inter-organization statements and results presented in table 4.8. According to the results, 65.42% of the respondents indicated that their firm had customer integrated information systems (mean=3.82). This is highlighted by Mihalis & Michalis, (2016) that information technology (IT) integration between firms is an enabler of supply chain flexibility, agility and hence higher business

performance. Further to this, Fredrik *et al.,* (2016) articulate that in order to achieve a more integrated business process collaboration, information technology is a key enabler. According to Wu *et al.,* (2015), Product oriented strategic alignment require an alignment between IT strategy and business strategy in product development.

Majority of the respondents 75.84% indicated that their firms receive and process orders electronically to a large extent (mean=3.64). This is in line with Wu et al. (2015) who highlighted the significance of inter-organization systems in performing tasks such as receiving and processing orders, receiving customer feedback online among others to be the most valuable piece of management in businesses creating a competitive advantage. Linking operational activities of the firm and linking of inter-firm relationships require investment in IT to guarantee organizational performance (Tarafdar & Qrunfleh, 2016). This statement also agree with Younghoon *et al.,* (2019) on the importance of the IT in building the absorptive capacity which is the ability of the firm to recognize the value of new external knowledge, incorporate and assimilate it as well as apply it to commercial ends that builds and strengthens a firm knowledge capabilities which greatly contribute to innovation as a result of exploration and exploitation that influence firms performance in their approach to innovation. In addition, majority of the respondents, 68.03% indicated that their firm manages their inventory electronically to a large extent (mean=3.88). This aligns with Ashir (2016) and Link & Back, (2015) postulation that linking various business strategies and relationships with IT systems such as enterprise resource planning (ERP) and electronic data interchange (EDI) provide a high level of supply chain process integration through internet-based applications. This statement agree with Roya & Nima, (2019) that linking business operations with IT is important for improvement of supply chain agility, cycle time reduction, attain greater efficiency and timely delivery of products to customers.

Further, 68.77% of the respondent indicated that they received customer feedback electronically to a large extent (mean=3.99). This is in line with Younghoon *et al.,* (2019 and Bessant *et al.,* (2013) that business agility allows firms to rapidly respond to customer demand in real time to compete strategically in a highly changing business environment. IT efficiency and business agility are key capabilities that

firms must acquire to enhance competitive advantage of a firm. The study also revealed that 67.66% of the respondents indicated a large extent on the statement that their firm electronically shares market information (mean=3.78). This align well with Roya & Nima, (2019) studies that revealed IT implementation in the supply chain provide timely, accurate and reliable information for decision making and higher performance. The results also showed that 65.06% of the respondents confirmed the statement that their customers pay electronically to a large extent (mean=3.90) which is in line with Younghoon *et al.*,, (2019 that inter-organizational link through IT systems helps a firm mitigate risk of losing control of vendors as well as behavioral, relational, and financial risks. Moreover, many respondents 68.78% of the respondents indicated a score of large extent on the statement that their firms electronically coordinate deliveries (mean=3.98). This is in line with Wu et al. (2015) Market-oriented strategic alignment findings that the alignment between IT strategies and business strategies are core to support of all market-oriented activities.

The results further revealed that 67.66% of the respondents indicated that their firms electronically undertake corrective actions to a large extent (mean=3.94). These statements are in line with operational excellence findings by Wu et al. (2015) that IT linkage offers a competitive advantage to a firm due to enhanced responsiveness and productivity improvements in productivity relative to its competition. This statement is in agreement with Aboobucker *et al.,* (2019) that strategic alignment arises as collaboration among business strategy, IT strategy, organizational infrastructure and process, information systems (IS) infrastructure as well as process domains. This will lead to greater communication and exchange of ideas among different functional division and thus strategic alignment of manufacturing, marketing and other functional areas for better organizational performance (Sardana *et al.,* 2016). Further Roya & Nima, (2019) stated that by embedding IT into a supply chain system, a firm is can improve channel specific assets through effective information exchange and better coordination with supply chain partners. On a five point scale, the average mean of the responses was 3.88 however, the answers were varied as shown by the standard deviation of 0.91 which mean that the majority of the respondents indicated a large extent with the statements that the better the IT to business strategy alignment the better the firm performance and the worse the alignment, the lesser firm

performance. this is well in line with (Van Grembergen & De Haes, 2017) that Information technology (IT) in many organizations supports the sustainability and growth of their businesses. Therefore, according Roya & Nima, (2019) linking of business strategies, activities and building of relationships through IT systems is the basis for organizations to improve the process of supply chain management (SCM) systems.

Table 4.12: Descriptive Results for the Moderating Effect of Inter-Organizational Systems

Statement	no extent	small extent	moderate extent	large extent	very large extent	Mean	SD
our firm has integrated information systems	3.72%	11.90%	18.96%	45.35%	20.07%	3.82	0.91
We receive and process orders electronically	1.86%	6.32%	15.99%	44.24%	31.60%	3.64	1.00
We manage inventory electronically	1.49%	9.67%	20.82%	43.12%	24.91%	3.88	0.91
We receive Customer feedback electronically	3.35%	9.67%	18.22%	45.35%	23.42%	3.99	0.92
Our firm electronically share market information	1.86%	10.78%	19.70%	43.87%	23.79%	3.78	0.90
Our customers pay electronically	2.23%	13.01%	19.70%	40.15%	24.91%	3.90	0.92
Our firm electronically coordinate deliveries	2.97%	11.90%	16.36%	44.24%	24.54%	3.98	0.92
Our firm electronically undertake corrective actions	3.72%	8.92%	19.70%	40.52%	27.14%	3.94	0.94
Average						**3.88**	**0.91**

4.4 6: Organizational Performance

The respondents were asked to indicate the extent of their firm's performance and respond on a five likert scale and the results presented on table 4.9. According to Jordana *et al.,* (2019) Performance defined as a parameter used to measure or quantify the efficiency and effectiveness of past action. The various responses and percentages on performance related questions presented and responded to, revealed that 32.34% of the respondents indicated that their firms' have met their annual

target achievements to a large extent (mean=4.01). this is in line with Shradha et al., (2017) statement that on the basis of long-term and short-term goals of supply chain management (SCM), the organizational performance could be measured by financial and market share, customer satisfaction and return on investment. The statement further agree with Jordana *et al.,* (2019) that performance reflect return on assets, general profitability of the firm return on sales and cash flows.

Additionally, majority 38.06% and 31.72% of the respondents agreed that their firms' had improved customer satisfaction to a large and very large extent respectively (mean=3.91). This the statements agree with Amit *et al.,* (2016) that relational outcomes of performance include Transparency, credibility, and effectiveness of the relationship. Further, 42.75% and 30.48% of the respondents indicated that their firms had increased market share to a large extent and very large extent respectively (mean=3.96). This is well in line with Shradha *et al.,* (2017) that business profitability is associated with market and business shares. In addition, 93.31% (39.03% +33.09%) of the respondents agreed that their firms' maintain timely order delivery (mean=3.98). This statement is articulated by Jordana *et al.,*(2019) that performance could be measured by Production flexibility ,production time, speed of delivery and production Cost. Ivy *et al.,* (2019) further articulate that performance is determined by annual gross margin, sales growth, return on investment (ROI), customer satisfaction and retention, new customers gained and reputation of the company. The results also revealed that 93.68% of the respondents agreed to the statement that their firms have reduced operation costs (mean=4.00). This agree with Amit *et al.,* (2016) that performance is as a result of operational outcomes which include, reduced costs, quality improvements, improved or superior customer service, value delivery to customers and cycle time reduction. Moreover, the results showed that 92.57% of the respondents agreed that their firms exercised accurate forecasting (mean=3.90).

The results showed that 92.98% of the respondents agreed that their firms' had achieved product quality improvements (mean=3.98). This agrees with studies by Daniel *et al.,* (2016) and Jordana *et al.,* (2019) who premised total quality control emphasizes on the conformance to specification through standardization of processes

to reduce or minimize variation of outputs or product Quality and conformity to set standards. Finally, the results also showed that 91.82% of the respondents indicated that there was increased revenue in sales to a moderate, large and very large extent (mean=3.97). This is articulated by Shradha *et al.,* (2017) and Amit *et al.,* (2016) that organisational performance is a measure of cost savings, revenue growth, reduced defects, better asset utilization, stronger competitive position and improved profits. On a five point scale, the average mean of the responses was 3.97 implying that majority of the respondents rated a large extent on the statements about their firms' performance presented in the study; however, the answers were varied as shown by a standard deviation of 0.9275.

Table 4.13: Descriptive Results for the organizational Performance

Statement	no extent	small extent	moderate extent	large extent	very large extent	Mean	SD
Annual targets Achievements	0.74%	7.43%	14.50%	44.98%	32.34%	4.01	0.91
Improved Customer satisfaction	2.61%	5.60%	22.01%	38.06%	31.72%	3.91	1.00
Increased market share	1.12%	5.20%	20.45%	42.75%	30.48%	3.96	0.91
Timely order deliveries	0.74%	5.95%	21.19%	39.03%	33.09%	3.98	0.92
operational costs reduction	1.12%	5.20%	18.59%	43.12%	31.97%	4.00	0.90
Accuracy in forecasting	0.74%	6.69%	22.68%	41.26%	28.62%	3.90	0.92
Product quality improvements	0.74%	6.32%	19.33%	41.26%	32.34%	3.98	0.92
Increased revenue in sales	1.12%	7.06%	17.47%	42.75%	31.60%	3.97	0.94
Average						**3.97**	**0.9275**

4.6 Inferential Analysis

The purpose of the study was to determine the influence of supply chain relationship management on performance of pharmaceutical firms in Kenya. The independent variables were Transparency, resilience building, collaborative planning and process alignment while the dependent variable was performance of pharmaceutical firms'. In addition, inter-organisational systems was the moderating variable between independent

variables and dependent variable. The study therefore sought to establish the statistical relationship between these variables through inferential statistics. The main measures that were used included the R squared (R^2), the P-value and Beta coefficients. Inferential analysis goes beyond presenting the responses in a study by unveiling the statistical relationship between the variables and how independent variable affects or influences the dependent variable (Young, 2010). Through this kind of analysis and relationship conclusions and recommendations of the study are given

Before carrying out inferential statics such as the correlations and regression, factor analysis was undertaken to establish factor loadings and provide a basis for the acceptance or elimination of factors for inclusion into the study. The study used factor analysis to define underlying structure of the variables in the analysis. As a rule of thumb the first factor will always account for the most variance and hence have the highest Eigen values (Cattell 1966) which involves the visual exploration of a graphical representation of the eigenvalues for breaks or discontinuities (Ledesma and Valero 2007; Zoski and Jurs (1990).

4.6.1 Correlation analysis between Transparency and Organizational Performance

A correlation is used to estimate the strength of the linear relationship between two variables representing how closely two variables co-vary ranging from -1 termed as perfect negative correlation through 0 or no correlation to +1 termed as perfect positive correlation (Jan *et al.,* (2011). Correlation is measured by correlation coefficient that represents the strength of the putative linear association between the variables in question (Joseph & Alan, 2012). A correlation coefficient of zero is an indicator nonexistent of linear relationship between two continuous variables while a correlation coefficient of -1 or +1 indicates a perfect linear relationship.

The stronger the correlation between variables, the closer the correlation coefficient comes to ±1 (Richard, 1990). If the coefficient is a positive, then the variables are directly related meaning that if the value of one variable goes up, the value of the other variable also tends goes up. on the other hand, if the coefficient is a negative then the variables are inversely related meaning that if the value of one variable goes

up, then value of the other variable goes down (Joseph & Alan, 2012). According to Artusi, *et al.,* (2012), Pearson correlation coefficient is good in measuring the association between couples of continuous data that is collected on the same experimental unit following a bivariate normal distribution. Correlation coefficients of 0.10 are small, 0.30 are medium and of 0.50 are large in terms of magnitude of their effect sizes (Cohen, 1988). The study used Pearson Correlation Coefficients because it was deemed to be the best as supported by Jan *et al.,* (2011). It the standard method of calculation and showed it to be the best one possible.

The researcher performed correlation analysis between Transparency and performance of pharmaceutical firms in Kenya and the results shown in Table 4.14. Credit facilities and performance of pharmaceutical firms have a relationship which is positive and significant (r=0.245, p=0.000). This finding is similar to those of Gaurev *et al* (2013) whose study found out that there was a significant positive relationship between Transparency and co-operation because when a firm has trust and dependence for its partner, it will make efforts to satisfy the request from or share information with the executives of its partner and maintain their co-operative relationship.

Further, sharing market information and performance of pharmaceutical firms have an insignificant and positive relationship (r=0.258, p=0.093). In addition, risk management and performance of pharmaceutical firms was positively but significantly correlated (r=0.163, p=0.000) This was in line with that of Mei-Yeng *et al* (2012) whose study findings indicated that there is a significant positive relationship between shared values and trust. Further, resolving customer conflict and performance of pharmaceutical firms are positively but significantly correlated (r=0.215, p=0.000) which is in line with Mabey and Thomson (2000). In addition, timely response and performance of pharmaceutical firms are positively and significantly correlated (r=0.215, p=0.000). Finally, the results showed that loyalty and performance of pharmaceutical firms are positively and significantly correlated (r=0.150, p=0.000). This also corresponds to the study by Mei-yeng *et al* (2012) whose study inferred that if partners have a high degree of consensus over service or

quality goals, their mid and high-ranking executives will have little doubt of the honesty and reliability of each other.

Table 4.14: Correlation for Transparency

Variables		perform	Credit facility	Market info	Risks manag	Resolve customer conflict	Timely response	loyalty
Organizational performance	Pearson Correlation	1						
credit facilities	Pearson Correlation	.245**	1					
	Sig. (2-tailed)	.000						
market information	Pearson Correlation	.258**	.262**	1				
	Sig. (2-tailed)	.093	.000					
risks management	Pearson Correlation	.163**	.206**	.172**	1			
	Sig. (2-tailed)	.000	.001	.005				
resolve customer conflict	Pearson Correlation	.212**	0.079	.163**	.129*	1		
	Sig. (2-tailed)	.000	.196	.008	.035			
Timely response	Pearson Correlation	.215**	-0.004	-0.011	.615**	.203**	1	
	Sig. (2-tailed)	.000	.948	.856	.000	.001		
firm loyalty	Pearson Correlation	.150**	.126*	0.116	.212**	.430**	.271**	1
	Sig. (2-tailed)	.070	.004	.057	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed).

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

4.6.2 Regression Analysis for Transparency

To understand the relationship between the independent variables, Transparency and dependent variable performance, regression analysis was performed. The objective of the regression analysis is to determine the extent of the relationship and examine whether Transparency can be used to explain performance of pharmaceutical firms in Kenya. The T-test statistic and the R^2 Test statistic were computed to determine the strength of the relationship as well. The regression results presented on Table 4.15

shows that Transparency was found to be satisfactory in explaining performance of pharmaceutical firms which is supported by coefficient of determination also known as the R^2 of 51.1 %. Meaning that Transparency explains 51.1 % of the variations in the dependent variable; performance of pharmaceutical firms. These findings were consistent with that of Dick Martin (2014) who found that Transparency have a positive impact on performance.

Further, the results implied that Transparency is a good predictor of performance of pharmaceutical firms as supported by calculated F statistic (3.038) which was greater than the critical F statistic (2.19) indicating that Transparency have a significant influence on performance of pharmaceutical firms. This finding tallies with that of Emanueal(2012) that, Inter-firm trust influences a recognizable economic outcomes such as sales growth, cash flow and increased Return on Investment (ROI).With regard to the cost perspective, the meta-analysis demonstrated a modest purchasing cost reduction as a consequence of increased levels of inter-firm trust between partners while providing strong support for the effect of trust on lowered transaction costs. The regression of coefficients that credit facilities and performance of pharmaceutical firms indicated a positive and significant relationship (β =0.106, p=0.001) in agreement with Brinkhoff (2015) who found positive relationship between credit facilities and performance of firms.

Further, sharing market information and performance of pharmaceutical firms have a positive and insignificant relationship (β =0.025, p=0.450) which is supported by Dick (2014) involving customers in risk management and performance of pharmaceutical firms have a positive and significant relationship (β =0.007, p=0.003) while resolving customer conflicts and performance of pharmaceutical firms are positively and significantly related (β =0.068, p=0.002). These findings are supported by Dick (2014) who suggested resolving of customer conflicts should be given high priority in supply chain. In addition, timely response and performance of pharmaceutical firms was found to have positive and significant relationship (β =0.027, p= 0.000). This is in line with Fayezi (2015) whose study findings indicated a positive and significant relationship between timely response and the performance of pharmaceutical firms. Finally, the findings suggested that building loyalty and

performance of pharmaceutical firms have a positive and insignificant relationship (β =0.088, p=0.029) which is supported by Lee (2016) whose analysis conclusion suggested that building customer loyalty is one of the key strategy for relationship management and performance of the pharmaceutical firms.

Table 4.15: Regression Model Analysis for Transparency

Model Summary

Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate
Coefficients	.715[a]	.511	.498	.4929

a. Predictor: Transparency

ANOVA

Measure	Sum of Squares	df	Mean Square	F	Sig.
Regression	9.135	6	1.5225	3.038	.000
Residual	60.656	127	0.501		
Total	69.791	133			

a. Dependent Variable: Performance Of Pharmaceutical Firms

b. Predictor: Transparency

Coefficients

Variables	β	Std. error	t	Sig
(Constant)	3.229	0.226	14.27	0.000
Credit facilities	0.106	0.030	3.503	0.001
Involvement in risks management	0.007	0.042	0.160	0.003
Easily resolve customer conflict	0.068	0.040	1.689	0.002
Timely response	0.027	0.041	0.658	0.000
Building loyalty	0.088	0.040	2.195	0.029

a. Dependent variable: performance

Regression model:

$Y_1 = 3.229 + 0.106\ CF + 0.088BL + 0.068RC + 0.027TR + 0.007RM + \varepsilon$

Where:

Y_1 = Performance of the firm

CF= extension of Credit Facilities

BL=building loyalty

RC=Resolving Customer Conflicts

TR =timely response

RM =customer involvement in Risk Management and

ε - Error term

4.6.3 Correlation Analysis Between Resilience Building and Organizational Performance

The researcher performed correlation analysis between resilience and performance of pharmaceutical firms in Kenya. The results in Table 4.16 show the correlation between resilience building and performance of pharmaceutical firms. The results shows that response to new customer requirements and firms performance have a positive and significant relationship (r=0.191, p=0.002). Additionally, the results revealed that adaption to supply disruptions have a positive and significant relationship with the pharmaceutical firms performance of (r=201, p=0.001). These findings were consistent with that of Lee (2016), who found out that adaptations to new customer requirements and supply disruptions have positive effect on firm performance. Additionally, the results indicated that assured supply have a positive and significant association with performance of pharmaceutical firms (r=0.190, p=0.002). This finding is similar to that of Andreas *et al.* (2013) whose findings indicated that communicative and cooperative relationships have a positive effect on resilience, while integration does not have a significant effect.Further, the results revealed that timely response to new customer demands was positively and insignificantly correlated with at performance of pharmaceutical firms (r=0.171, p= 0.065) and response to unanticipated customer needs is positively and significantly correlated with performance of pharmaceutical firms (r=0.169, p=0.006).

These findings were in line with that of Fayezi (2015) who found out that response to customer needs, response to new customer demands, and assured supply have large and positive influence on the performance of pharmaceutical firms hence firms

should devise ways on how to effectively respond on them. Finally, the results also revealed that innovative to new preferences is positively and significantly associated with the performance of pharmaceutical firms (r=0.111, p=0.000) which is consistent with the findings by Lee (2016) who found that there was improved resilience, obtained by investing in agility and robustness, enhances a supply chain's customer value.

Table 4.16: Correlation Analysis for Resilience Building

variables		perform	New requirement	Supply disruptions	Stable assured supply	New customer demands	Unanticipated needs met	Innovativeness
performance	Pearson Correlation	1.000						
	Sig. (2-tailed)							
New customer requirements	Pearson Correlation	0.191**	1.000					
	Sig. (2-tailed)	0.002						
Supply disruptions	Pearson Correlation	0.201**	0.113	1.000				
	Sig. (2-tailed)	0.001	0.063					
Assured supply	Pearson Correlation	0.190**	0.626**	.217**	1.000			
	Sig. (2-tailed)	0.002	0.000	0.000				
New customer demands	Pearson Correlation	0.171	0.666**	.180**	.617**	1.000		
	Sig. (2-tailed)	0.065	0.000	0.003	0.000			
Unanticipated customer	Pearson Correlation	0.169**	0.170**	0.111	.149*	.129*	1.000	
	Sig. (2-tailed)	0.006	0.005	0.068	0.014	0.034		
Innovativeness	Pearson Correlation	0.111**	0.140*	0.098	.151*	.213**	.212**	1.000
	Sig. (2-tailed)	0.000	0.022	0.11	0.013	0.000	0.000	

** Correlation is significant at the 0.01 level (2 tailed).

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

4.6.4 Regression Analysis for Resilience Building

The second objective of the study was to identify the influence of resilience building on performance of pharmaceutical firms in Kenya. Regression analysis was used to examine whether resilience building can be used to explain performance of pharmaceutical firms in Kenya. The regression results presented on Table 4.17 shows that resilience building was satisfactory in explaining performance of pharmaceutical firms which was supported by a coefficient of determination also known as the R^2 of 57.5%. This means that the model Resilience building can explain 57.5 % of the variations in the dependent variable which is performance of pharmaceutical firms. Further, the results implied that Resilience Building is a good predictor of performance of pharmaceutical firms as supported by calculated F statistic of 4.2510 which is greater than the critical F statistic of 2.19 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level.

The regression of coefficients showed that that adapting to new customer requirements and performance of pharmaceutical firms have a positive and significant relationship (β=0.58, p=0.005) which is in agreement with Khanna (2012), in his study on aligning to marketing strategies. Further, supply disruptions and performance of pharmaceutical firms have a positive and significant relationship (β =0.09, p=0.001) which is supported by Khanna (2012) whose findings showed positive and significant relationship between preventing supply disruptions and performance of pharmaceutical firms. Stable and assured supply and performance of pharmaceutical firms have a positive and significant relationship (β =0.34, p=0.000) while being alert to new customer demands and performance of pharmaceutical firms are positively and significantly related (β =0.08, p=0.007). These findings are supported by (Kumar, 2014) who found out that stable and assured supply was significantly and positively associated with the performance of the firm. In addition, timely response to unanticipated customer needs and performance of pharmaceutical firms was found to have positive and insignificant relationship (β =0.71, p= 0.065). This is in line with Bill (2016), who found that there was positive relationship between satisfaction of customer needs and performance of the pharmaceutical firms. Finally the findings suggested that innovativeness to new preferences and

performance of pharmaceutical firms have a positive and significant relationship (β =0.27, p=0.002) which is supported by Green (2012) who suggested that the best strategy to stay competitive is to be innovative which boosts the performance.

Table 4.17: Regression Analysis for Resilience Building

Model Summary

Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate
Coefficients	.758	.575	.521	.4927

a. Predictor: Resilience Building

ANOVA

Measure	Sum of Squares	Df	Mean Square	F	Sig.
Regression	6.198	6	1.033	4.2510	.000[b]
Residual	63.593	127	.243		
Total	69.791	133			

a. Dependent variable: performance of pharmaceutical firms
b. Predictors: resilience building

Coefficients

Variables	β	Std. Error	t	Sig.
(Constant)	2.823	0.237	11.9114	0.000
Adapting to customer requirements	0.58	0.050	11.6	0.005
Supply disruptions	0.09	0.035	2.571	0.001
stable and assured supply	0.34	0.045	7.556	0.000
Alert to new customer demands	0.08	0.048	1.6667	0.007
Timely response to customer needs	0.71	0.039	18.205	0.065
Innovativeness to new preferences	0.27	0.036	7.5000	0.002

a. Dependent variable : performance of pharmaceutical firms

Regression model:

$Y_1 = 2.2823 + 0.58\ CR + 0.34SS + 0.27NP + 0.09SD + 0.08CD + \varepsilon$

Where:

Y_1 = Performance

CR- New Customer Requirements

SS- Stable and assured Supply

NP- New Preferences

SD- Supply Disruptions

CD- Alertness to Customer Demands and

ε - Error term

4.6.5 Correlation Analysis Between Collaborative Planning and Organizational Performance

The researcher performed correlation analysis between collaborative planning and performance of pharmaceutical firms in Kenya. The results in Table 4.18 show the correlation between collaborative planning and performance of pharmaceutical firms. The results shows that collaboration in new product development has a positive and significant relationship with performance of the pharmaceutical firms (r= 0.177, p=0.03). These results matched with that of Hall *et al.,* (2012) whose findings suggested that inter-organizational collaboration, inter-organizational IT use, and cooperative attitude directly impacted contingency planning effectiveness.

Further, there is positive and significant relationship between joint execution schedules and performance of the pharmaceutical firms (r=0.138, p=0.004). These results are consistent with the findings by Kamar (2016) who found that collaboration with customers in new product development and joint execution schedules are positively associated with performance of the pharmaceutical firms. Additionally, the results revealed that common IT system is positively and significantly associated with performance of the pharmaceutical firms **(**r=0.067, p=0.007) while joint project teams are also positively and significantly associated with performance of the pharmaceutical firms (r= 0.146, p=0.000). These results were in line with that of Kumar (2014) who found that shared IT system, team projects with customers, and involving customers in forecasting were positively correlated with the performance of retailing firms.

Further, the results showed that there is positive and significant relationship between involving customers in planning marketing activities and performance of the pharmaceutical firms (r=0.127, p= 0.002). These results were similar to those of Hall

et al (2016) whose study found that Inter-organizational collaboration mediates the relationships between the other antecedents and contingency planning effectiveness. Finally, the study also revealed that sharing financial resources had positive and insignificant relationship with performance of the pharmaceutical firms (r=0.114, p=0.061). These results were inconsistent with that of Eksoz (2014) who found out that involving customers in planning marketing activities had a positive influence on performance of the pharmaceutical firms.

Table 4.18: Correlation Analysis for Collaborative Planning

Variables		Performance	New Product Deve	Joint Execution Schedules	Comm IT	Joint Project Teams	Planning Marketing Activities	Financial Resources
Performa	Pearson Correlation	1.000						
	Sig. (2-Tailed)							
New Product Develop	Pearson Correlation	0.177**	1.000					
	Sig. (2-Tailed)	0.003						
Joint Execution Schedules	Pearson Correlation	0.138**	0.092	1.000				
	Sig. (2-Tailed)	0.004	0.131					
Common IT System	Pearson Correlation	0.067**	0.114	.245**	1.000			
	Sig. (2-Tailed)	0.007	0.061	0				
Joint Project Teams	Pearson Correlation	0.146**	.198**	.253**	.238**	1.000		
	Sig. (2-Tailed)	0.000	0.001	0	0			
Planning Marketing Activities	Pearson Correlation	0.127	-0.008	0.095	.191**	.208**	1.000	
	Sig. (2-Tailed)	0.002**	0.893	0.121	0.002	0.001		
Financial Resources	Pearson Correlation	0.114	0.042	0.243*	.234**	0.253**	0.146*	1.000
	Sig. (2-Tailed)	0.061	0.488	0.000	0.000	0.000	0.017	

** Correlation Is Significant At The 0.01 Level (2-Tailed).

* Correlation Is Significant At The 0.05 Level (2-Tailed).

4.6.6 Regression Analysis for Collaborative Planning

The third objective of the study sought to establish the influence of collaborative planning on performance of pharmaceutical firms in Kenya. Regression analysis was used to examine whether collaborative planning can be used to explain performance of pharmaceutical firms in Kenya. Collaborative planning was found to be satisfactory in explaining performance of pharmaceutical firms as supported by coefficient of determination also known as the R^2 of 32.3%. This means that collaborative planning explain 32.3% of the variations in the dependent variable, performance of pharmaceutical firms. Further, the results revealed that collaborative planning is a good predictor of performance of pharmaceutical firms as supported by a calculated F statistic of 2.629 which is great or than the critical F statistic of 2.19 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level. The regression of coefficients showed that collaboration with customers in new product development and performance of pharmaceutical firms have a positive and significant relationship (β =0.088, p=0.000) which is in agreement with Torres *et al.,* (2014). Further, joint execution schedules and performance of pharmaceutical firms have a positive and significant relationship (β =0.53, p=0.001). Common installed IT system and performance of pharmaceutical firms have a positive and significant relationship (β =0.22, p=0.000) while having joint project teams and performance of pharmaceutical firms are positively and significantly related (β =0.44, p=0.003). These findings are supported by Kuma (2016) who found that joint projects are positively and significantly associated with the performance of pharmaceutical firms. In addition, involving customers in planning marketing activities and performance of firms was found to have positive and significant relationship (β =0.05, p= 0.003). This is in line with Menguc *et al* (2013) whose findings revealed positive and significant relationship between collaborative marketing activities and performance of firms. Finally the findings suggested that sharing financial resources and performance of pharmaceutical firms have a positive and insignificant relationship (β =0.34, p=0.284) which is supported by Kumar (2016) who in his study concluded that sharing resources and finances have a positive and significant impact on firms performance.

Table 4.19: Regression Analysis for collaborative planning

Model Summary

Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate
Coefficients	.569	.323	.310	.5013

a. Predictor: Collaborative Planning

ANOVA Table

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.962	6	.660	2.629	.000[b]
Residual	65.829	127	.251		
Total	69.791	133			

a. Dependent Variable: Performance of Pharmaceutical Firms
b. Predictors: Collaborative Planning

Regression of Coefficients

Variables	B	Std. Error	t	Sig.
(Constant)	3.132	0.231	13.558	0
New product development	0.088	0.036	2.444	0.000
Joint execution schedules	0.530	0.037	14.324	0.000
Common IT system	0.220	0.031	7.097	0.001
Joint project teams	0.440	0.036	12.222	0.003
Planning marketing activities	0.050	0.031	1.613	0.003

a. Dependent Variable: Performance of Pharmaceutical Firms

Regression model:

$Y_1 = 3.132+0.53JE+0.44JP+0.22CIT+ 0.088\ NP + 0.05PM+ \varepsilon$

Where:

Y_1 = Performance

JE=Joint Execution Schedules

JP=Joint Project Teams

CIT=Common IT Systems

NP=New Product Development,

PM= jointly Planning Marketing Activities and

ε - Error term

4.6.7 Correlation Analysis Between Process Alignment and Organizational Performance

The results of correlation between process alignment and Performance were presented in Table 4.20. The results shows that there is positive and significance correlation between data exchange and performance of pharmaceutical firms (r=0.178, p=0.14). These results were inconsistent with that of Wong *et al.,* (2012) whose study findings revealed that information sharing helps to improve visibility and therefore improves the allocation of inventory, production scheduling and knowledge transfer process. Additionally, the results revealed positive and significant relationship between provision of satisfactory product characteristics and performance of pharmaceutical firms (r=0.202, p=0.001) which was in line with Wong *et al.,* (2012) findings that quality of information is achieved by sharing relevant, accurate and sufficient information on supply in a timely manner enhances process alignment and performance of the firm.

Further, it was revealed that the relationship between satisfactory marketing activities and performance of pharmaceutical firms was positive and significant (r=0.208, p=0.001). These results were consistent with the findings by Khan and Christopher (2012) who found positive and significant relationship between acceptable data exchanges with customers, satisfactory product attributes and performance of pharmaceutical firms. Additionally, the result showed that there is positive and significant relationship between the delivery standards and performance of pharmaceutical firms (r=0.165, p=0.007). These findings are similar to those of Wong *et al.,* (2012) who found out that there is positive relationship between delivery standards and the performance of firms. Further, there is significant and positive relationship between compatible management styles and performance of pharmaceutical firms (r=0.017, p=0.001). Finally, the study revealed positive and insignificant association between acceptable firm's performance and performance of pharmaceutical firms (r=0.166, p=0.023). These findings were in inconsistent with

that of Sik (2017) who established positive relationship between compatible management styles and the performance of an organization

Table 4.20: Correlation Analysis for Process Alignment

variables		Perf	Data exch	satisfactory product characteristics	Satisfactory marketing activities	delivery stand	managemen t styles	acceptable perfo
	Pearson	1.00						
perform	Correlation	0						
	Sig. (2-tailed)							
	Pearson	0.17						
Data exchange	Correlation	8	1.000					
	Sig. (2-	0.01						
	tailed)	4						
product	Pearson	0.20						
characteristics	Correlation	2**	.734**	1.000				
	Sig. (2-	0.00						
	tailed)	1	0.000					
marketing	Pearson	0.20						
activities	Correlation	8**	.120*	0.079	1.000			
	Sig. (2-	0.00						
	tailed)	1	0.05	0.194				
delivery	Pearson	0.16						
standards	Correlation	5**	.167**	0.106	.242**	1.000		
	Sig. (2-	0.00						
	tailed)	7	0.006	0.082	0.000			
	Pearson	0.01						
managemt styles	Correlation	7**	0.041	0.069	.287**	.213**	1.000	
	Sig. (2-	0.00						
	tailed)	1	0.500	0.262	0.000	0.000		
acceptable	Pearson	0.16						
performance	Correlation	6	.155*	.205**	0.113	.205**	.195**	1.000
	Sig. (2-	0.02						
	tailed)	3	0.011	0.001	0.063	0.001	0.001	

** Correlation is significant at the 0.01 level (2-tailed).

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

4.6.8 Regression Analysis for Process Alignment

Regression analysis was conducted on the fourth independent variable, process alignment and found to be satisfactory in explaining performance of pharmaceutical firms supported by coefficient of determination also known as the R^2 of 69.7%. The R^2 of 69.7% means that process alignment can explain 69.7 % of the variations in the dependent variable; performance of pharmaceutical firms as shown in table 4.21. The

ANOVA for Process Alignment showed that Process Alignment is a good predictor of performance of pharmaceutical firms as supported by a calculated F statistic of 2.519 which is greater than the critical F statistic of 2.19 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level.

The results of regression of coefficients for Process Alignment showed that acceptable levels of customer service and performance of pharmaceutical firms have a positive and insignificant relationship (β =0.059, p=0.062) which is in contrast with Khan *et al* (2012) who found out that acceptable performance by the firms has direct effect on the performance of pharmaceutical companies. Compatible Management styles was also found to have a positive and significant relationship on performance of pharmaceutical firms performance (β =0.64, p=0.003). Further acceptable effective delivery standards and performance of pharmaceutical firms have a positive and significant relationship (β=0.48, p=0.007) which is supported by Li (2015) whose study results revealed a positive and significant association between delivery standards and the performance of the pharmaceutical firms.

Satisfactory strategic marketing activities and performance of pharmaceutical firms have a positive and significant relationship (r=0.401, p=0.003) while satisfactory product characteristics and performance of pharmaceutical firms are positively and significantly related (β =0.084, p=0.004). These findings are supported by Bill-Wang (2016) who found out that effective marketing strategies in conjunction with satisfactory product characteristics have significant and positive relationship with the performance of firms. In addition, data exchange and performance of pharmaceutical firms was found to have positive and insignificant relationship (β =0.005, p= 0.911). This is in line with Narayanan (2004) whose study found that there is consistent relationship between data exchange and performance of the pharmaceutical firms.

Table 4.21: Regression Analysis for Process Alignment

Model Summary

Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Coefficient	.835[a]	.697	.653	.4888

a. Predictor: Process Alignment

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.422	6	1.237	2.519	.000[b]
	Residual	62.368	127	0.4910		
	Total	69.790	133			

a. Dependent variable: performance of pharmaceutical firms
b. Predictors: process alignment

Coefficient s

Variables	β	Std. Error	t	Sig.
(Constant)	1.056	0.207	5.101	0
Our management styles are compatible	0.640	0.032	20.00	0.003
Our delivery standards are acceptable	0.480	0.031	15.483	0.007
Our firm marketing activities are satisfactory	0.401	0.033	12.151	0.003
We provide satisfactory product characteristics	0.084	0.049	1.7140	0.004

a. Dependent variable : performance of pharmaceutical firms

Regression model:

$Y_1 = 1.056 + 0.64\ MS + 0.48\ DS + 0.401MA + 0.084SP + \varepsilon$

Where:

Y_1 = Performance

MS=compatible Management Styles

DS= Acceptable Delivery Standards,

MA=Satisfactory Marketing Activities

PC=satisfactory Product Characteristics and

ε - Error term

4.6.9 Correlation Analysis for The Moderating Effect of Inter-Organizational Systems on The Relationship Between Supply Chain Relationship Management Practices and Organizational Performance

The results of the test of correlation between Inter-Organization and Performance are presented in Table 4.22. There is a positive and significance relationship between customer integrated information systems and the performance of the pharmaceutical firms (r=0.239, p=0.000). The results findings were consistent with that of Haque and Islam (2013) whose findings of the study indicated that SCM practices as observed in the industry comprise three dimensions, namely, collaboration and information sharing, logistics design and IT infrastructure. IT adoption is useful in improving four primary operational areas, namely, transaction processing, SC planning and collaboration, order tracking and delivery coordination, and material forecast.

Further the results revealed that receiving and processing orders electronically has a positive and significant relationship with performance of the pharmaceutical firms (r=0.137, p= 0.025) while managing inventory electronically related positively with performance of the pharmaceutical firms (r=0.292, p=0.000). The results were in line with the findings by Bill Wang (2016) who found positive relationship between customer integration information systems and performance of the firms. Additionally, it was found that receiving customer feedback was positively and significantly associated with performance of the pharmaceutical firms (r=0.236, p=0.001). These results echoed those of Haque and Islam (2013) whose findings showed a positive correlation between integration of customer feedbacks and the overall performance of the firm.

The results also revealed positive and significant relationship between sharing market information electronically and performance of the pharmaceutical firms (r=0.179, p=0.009). Further, the results revealed positive and significant relationship between electronic payment by customers and performance of the pharmaceutical firms (r=0.121, p=0.048). The findings are in line with that of Dehui *et al* (2014) who found positive effects of intra-organizational resources, including top

management support (TMS) and information technology (IT), on inter-organizational capabilities including supply chain integration (SCI) with a focus on supplier integration (SI) and customer integration (CI)) and on business performance.

In addition, the results revealed positive and significant relationship between electrically coordinating deliveries and performance of the pharmaceutical firms ($r=0.238$, $p=0.004$). Finally, it was found that collective actions undertaking electronically has a positive and significant association with the performance of the pharmaceutical firms ($r=0.166$, $p=0.006$). These findings were consistent with the study results by Brinkoff (2015) who found that performing operations electronically had a positive relationship with the performance of the firm.

Table 4.22: Correlation Analysis for Inter-Organization Systems

Variables		Perf	Inte info	Receive/ process orders	Manag invento electronic	Custo feed	Mark info	Elect payments	Cord deliveries	cor ract
Performance	Pearson Correlation	1								
	Sig. (2-tailed)									
integrated information systems	Pearson Correlation	.239**	1.000							
	Sig. (2-tailed)	0.000								
receive and process orders	Pearson Correlation	.137*	.342**	1.000						
	Sig. (2-tailed)	0.025	0.000							
manage inventory electronically	Pearson Correlation	.292**	.262**	.416**	1.000					
	Sig. (2-tailed)	0.000	0.000	0.000						
receive customer feedback electronically	Pearson Correlation	0.236*	.338**	.243**	.125*	1.000				
	Sig. (2-tailed)	0.001	0.000	0.000	0.041					
electronically share market information	Pearson Correlation	0.179	.227**	.212**	.491**	.162**	1.000			
	Sig. (2-tailed)	0.009	0.000	0.000	0.000	0.008				
Electronic payments electronically	Pearson Correlation	0.121*	.375**	.342**	0.108	.192**	.248**	1.000		
coordinated deliveries	Pearson Correlation	0.238**	.367**	.377**	.239**	.265**	.362**	.612**	1.000	
	Sig. (2-tailed)	0.004	0.000	0.000	0.000	0.000	0.000	0.000		
electronically corrective actions	Pearson Correlation	.166**	.387**	.322**	.198**	.282**	.305**	.614**	.697**	1
	Sig. (2-tailed)	0.006	0.000	0.000	0.001	0.000	0.000	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

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

4.7 Overall Correlation between Independent and Dependent Variables

Correlation analysis between all independent variables and dependent variable was done. The results of the overall correlation analysis are presented in Table 4.23. The results revealed that inter-organization systems and performance of pharmaceutical firms are positively and significantly related (r = 0.514, p=0.000) in agreement with

the findings of Kumar (2014) and Bill Wang (2016) that inter-organisation systems has a significant impact on firms performance. Transparency and performance of pharmaceutical firms are positively and significantly related (r = 0.715, p=0.000) as supported by Brinkhoff (2015) who concluded that Transparency had a significant positive effect on firms performance.

The resilience building and performance of pharmaceutical firms are positively and significantly related (r=0.758, p=0.000) which is consistent with that of Lee (2016) who found out that quick adaptation to new customer needs, innovation to new preferences, alert to new customer demands and stable and assured supply all had significant and positive effect on performance of pharmaceutical firms. Additionally, collaborative planning have a positive and significant association with performance of pharmaceutical firms (r= 0.569, p=0.002) as supported by Eksoz (2014) who concluded that there is positive association between collaborative planning and performance of pharmaceutical firms. Further, the results revealed a positive and significant relationship between process alignment and performance of pharmaceutical firms in Kenya (r=0.835 , p=0.000) which is consistent with the results by Khan and Christopher (2012) who found positive and significant relationship between process alignment and performance in pharmaceutical firms in Kenya.

Table 4.23: Overall Correlation between Independent and Dependent Variables

Variables		Perform	Inter-organization system	Trust& transparency	Resilience building	Collaborative planning	Process alignment
Performance	Pearson Correlation	1					
	Sig. (2-tailed)						
Inter-organization system	Pearson Correlation	.514**	1				
	Sig. (2-tailed)	0.000					
Transparency	Pearson Correlation	.715**	.316**	1			
	Sig. (2-tailed)	0.000	0.000				
Resilience building	Pearson Correlation	.758**	.326**	.367**	1		
	Sig. (2-tailed)	0.000	0.000	0.000			
Collaborative planning	Pearson Correlation	.569**	.362**	.263**	.428**	1	
	Sig. (2-tailed)	0.002	0.000	0.000	0.000		
process alignment	Pearson Correlation	.835**	.154*	.290**	.340**	.456**	1
	Sig. (2-tailed)	0.000	0.012	0.000	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

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

4.8 Unmoderated Multiple Linear Regression Model

The study further investigated the combined effect of supply chain relationship management on performance of pharmaceutical firms in Kenya. The results in Table 4.24 presented the fitness of model of regression model used in explaining the study phenomena. Transparency, resilience building, collaborative planning and process alignment were all found to be satisfactory variables in the overall firm performance. This was supported by coefficient of determination the R square of 62.8%. This shows that Transparency, resilience building, collaborative planning and process alignment explain 62.8% of the firm performance. Further, the results implied that the independent variables are good predictors of firm performance. This was supported by a calculated F statistic of 27.459 which is greater than the critical F statistic of 2.46 and the reported p value (0.000) which was less than the

conventional probability of 0.05 significance level. Thus, the ANOVA results indicated that the overall model was statistically significant.

Regression of coefficients showed that Transparency and firm performance were positively and significantly related (β=0.332, p=0.000). These findings were consistent with Brinkhoff *et al* (2015) whose results found positive and significant relationship between Transparency and firm performance. The results also revealed that resilience building and performance were positively and significantly related (β=0.308, p=0.001). These findings were consistent with that of Dick, (2014) who found out positive and significant association. The results revealed that collaborative Planning and performance were positive and significantly related (β=0.336, p=0.000). These findings were consistent with those of Montoya-Torres (2014) whose results showed that collaborative planning had positive and significant relationship with firm's performance. Regression of coefficients also showed that Process alignment and performance were positively and significantly related (β=0.18, p=0.009). These findings were consistent with those Lin (2016) whose results found that process alignment has a positive and significant effect on performance of the pharmaceutical firms.

Table 4.24: Overall Regression Analysis before Moderation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.628	.604	.4319

a. Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.542	4	5.135	27.459	.000[b]
	Residual	49.250	129	.187		
	Total	69.791	133			

a. Dependent Variable: Performance of Pharmaceutical Firms

b. Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

Coefficients

variables	β	Std. Error	t	Sig.
(Constant)	1.023	0.285	3.589	0.000
Transparency	0.332	0.054	6.148	0.000
Resilience Building	0.308	0.060	5.133	0.001
Collaborative Planning	0.336	0.058	5.7931	0.000
Process alignment	0.180	0.055	3.2727	0.009

a. Dependent variable: Performance of Pharmaceutical Firms

Regression model before moderation

$Y = 1.023 + 0.336X_1 + 0.332X_2 + 0.308X_3 + 0.180\ X_4 + \varepsilon$

Where;

Y is performance of pharmaceutical firms

X_1 is Collaborative Planning

X_2 is Transparency

X_3 is Resilience Building

X_4 is Process alignment and

ε - Error term

4.9 Moderated Multiple Linear Regression Model

The fifth objective of the study was to establish the moderating effect inter-organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. The R^2 improved from 62.8% to 68.7% after moderation. This implies that inter-organization systems moderate the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. The results imply that the overall effect after moderation is significant. In addition, F statistic increased from 27.459 to 31.541.

The regression of coefficient showed that inter-organization systems moderate the relationship between Transparency and performance of pharmaceutical firms in Kenya (β=0.022, p=0.006). The results further showed that inter-organization systems moderates the relationship between resilience building and performance of pharmaceutical firms (β=0.017, p=0.007). The results further showed that inter-organization systems moderates the relationship between collaborative planning and performance of pharmaceutical firms (β=0.039, p=0.006). The results further showed that inter-organization systems moderates the relationship between process alignement and performance of pharmaceutical firms (β=0.005, p=0.04).

Table 4.25: Overall Regression analysis after Moderation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.829[a]	.687	.624	.4229

Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

ANOVA Table

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	22.582	4	5.646	31.541	.000[b]
Residual	47.034	129	.179		
Total	69.616	133			

a. Dependent Variable: Performance of Pharmaceutical Firms
b. Predictors: Transparency; Resilience Building; Collaborative Planning; Process Alignment

Regression Coefficient

Variables	β	Std. Error	t	Sig.
(Constant)	2.577	0.129	20.021	0
Transparency _IOS(X_1*M)	0.022	0.013	1.725	0.006
Resilience building _IOS(X_2*M)	0.017	0.015	1.818	0.007
Collaborative planning_ IOS(X_3*M)	0.039	0.014	2.791	0.006
Process alignment _IOS (X_4*M)	0.005	0.014	0.332	0.040

a. Dependent variable : Performance of Pharmaceutical Firms

4.10 Optimal Model

An optimal model was developed based on the regression coefficients of the overall moderated model of the study. From the overall regression model, it was clear that collaborative planning had more effect on performance than Transparency, resilience building, and process alignment. This is because change in collaborative planning by one unit would improve performance by 0.039 units while change in Transparency, resilience building, and process alignment by one unit would change the organization

performance by 0.022, 0.017, and 0.005 units respectively. Thus the optimal is specified as:

$Y = 2.577 + 0.039X_1.M + 0.022X_2 M. + 0.017X_3.M + 0.005X_4.M + \varepsilon$

Where:

Y is performance

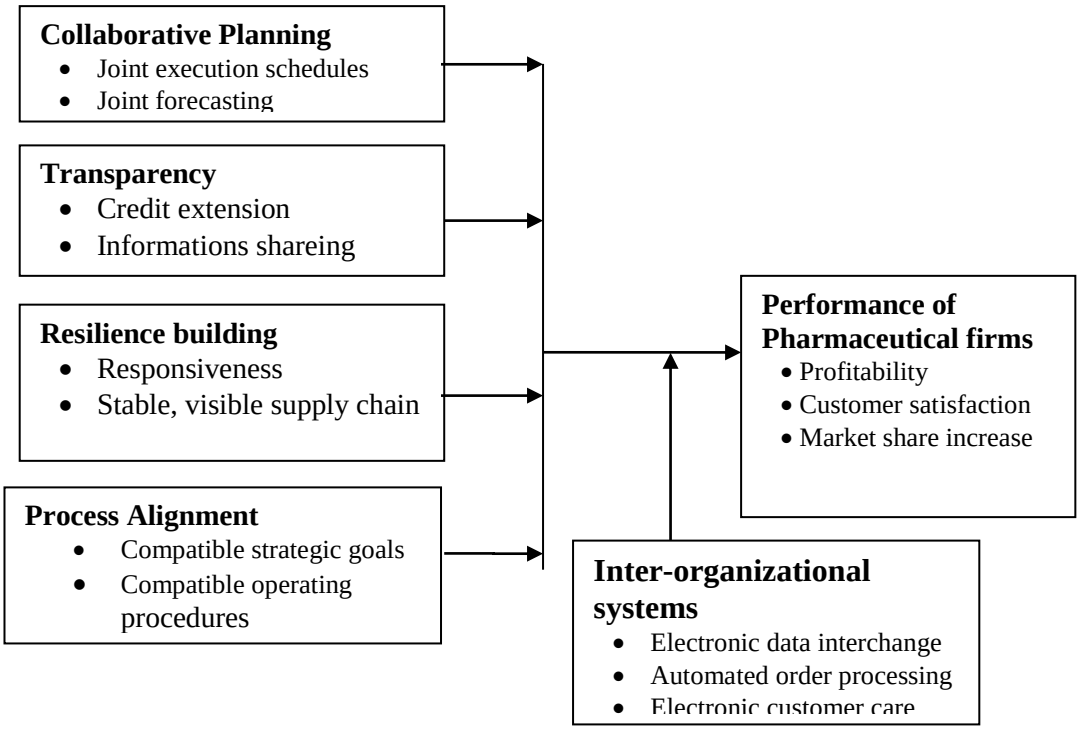
X_1.M is Collaborative Planning* inter-organization systems

X_2.M is Transparency* inter-organization systems

X_3.M is Resilience Building* inter-organization systems

X_4.M is Process Alignment* inter-organization systems and

ε - Error term



Independent Variables **Moderating Variable** **Dependent variable**

Figure 4.4: Revised Conceptual Framework

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the findings from the analysis, the conclusions and the recommendations. It will discuss findings of independent variables based on study objectives and in relation to the dependent variable. The summary, conclusions and recommendations given are in line with the objectives and the various hypotheses of the study. In addition various opportunities for further research are identified.

5.2 Summary of Findings of the Study

The study sought to establish the influence of supply chain relationship management on performance of pharmaceutical firms in Kenya guided by different theoretical framework that supports the conceptualized variables. The research employed a descriptive research design where a census sampling technique was utilized by enumerating all the study subjects to collect quantitative and qualitative data using a questionnaire. The results are based on the evidence of data analysis based on model fitness R^2, Anova model F-statistic and significance levels to help reject or accept Null hypothesis, regression coefficients to for each and every statement of independent variable as well as overall moderated regression model. The following were the findings of the study based on the revised conceptual framework and in order of significance.

5.2.1 Influence of Collaborative Planning On Performance of Pharmaceutical Firms

The third objective of the study was to examine how collaborative planning influences the performance of pharmaceutical firms in Kenya. Most of the firms have integrated collaborative planning methods in their operations. Joint execution schedules in pharmaceutical company enhanced the performance of the firm. Most pharmaceutical firms had adopted joint project teams with customers to identify and

track customers change of preferences. Additionally, most of the firms involved their customers in planning marketing activities and in new product development. These strategies have enhanced the performance of the firms by tapping and filling the immediate and most desired needs of the customers.

Installing common IT system ensures that the customers are familiar and comfortable with use of the systems and also understand the risk and benefits of the system which translates to more customer loyalty and consequently improved performance margins. This is geared towards collaborative planning forecasting and replenishment (CPFR) strategies that greatly enhance performance. The correlation results revealed that collaborative had a positive and significant relationship with performance of pharmaceutical firms. The regression results showed a coefficient of determination, that is, $R^2$of 32.3 % which means that Transparency explains 49.8% of the variations performance of pharmaceutical firms. The null hypothesis was rejected indicated that there was a significant relationship between collaborative planning and performance of pharmaceutical firms in Kenya. Given the importance of strategic planning to any company sustainability and performance, collaborative planning is an important and significant aspect which should be embedded into the business across all departments, business process, products and services. The board and management of pharmaceutical must have a collaborative planning policies and strategies in order to meet the performance targets. The

5.2.2 Influence of Transparency on Performance of Pharmaceutical Firms

The first objective of the study was to explore how Transparency influenced performance of pharmaceutical firms in Kenya. Most of the pharmaceutical firms exercised Transparency in their operations through ways such as extending credit facilities, building on timely responses, resolving customer conflicts in time, and involving customers in managing risks. In addition most firms allows installment buying in conjunction with efficient services which have increased Transparency levels of the firms. These findings explain the improved performance of the pharmaceutical firms and lack of these practices explains why some of these firms are not performing well. The regression results further indicated the existence of a

significant and positive relationship of Transparency and performance of the pharmaceutical firms in Kenya. The regression results showed a coefficient of determination, that is, $R^2$of 49.8% which means that Transparency explains 49.8% of the variations performance of pharmaceutical firms. The null hypothesis was rejected indicating that there was a significant relationship between Transparency and performance of the pharmaceutical firms in Kenya. This implies that firms have to continually invest in Transparency and come with policies that make the staff; stakeholders and stewards uphold the values of the firms which will then translate to customer loyalty and improve performance.

5.2.3 Influence of Resilience Building on Performance of Pharmaceutical Firms

The second objective of the study was to determine the influence of resilience building on the performance of the pharmaceutical firms in Kenya. The results revealed most pharmaceutical firms have established processes for resilience building. The firms have built polices on adapting quickly to new customer requirements, enhancing stable and assured supply, effective ways to deal with supply disruptions as well as creating environment and culture that promotes innovation to new preferences. Resilience building is used by most firms as part of the performance measurement and most respondents agreed that the firms has adopted ways of resilience building to improve the performance of the company.

Regression results further revealed that resilience building had a positive and significant relationship with performance of pharmaceutical firms. The regression results showed a coefficient of determination, that is, R^2 of 57.5% which means that resilience building explains 57.5% of the variations performance of pharmaceutical firms. The Null Hypotheses was rejected showing that there was a significant relationship between resilience building and performance of the firms in Kenya. This implies that pharmaceutical firms should pay close attention to the principles guiding resilience building in their firms and correct mix of resilience building factors. The firms should be able to align their resilience building policies with the firm's resources so that they can be able to match the customer requirements and the market changes.

5.2.4 Influence of Process Alignment on Performance of Pharmaceutical Firms

The fourth objective of the study was to examine how process alignment influenced performance of pharmaceutical firms in Kenya. Most pharmaceutical firms have put in place process alignment policies which have significant and positive effect on performance of the pharmaceutical firms in Kenya. Compatible management styles are very crucial in assessing the performance of a company since management sets the policies, strategies, foundations and the guidelines of the firms operations. Additionally, most of the firms have adopted management styles which are customer and performance oriented such as high and reliable delivery standards, satisfactory product characteristics, satisfactory marketing activities and acceptable levels of data exchange with customers. These practices assist the firms gain solid market share and customer loyalty hence improved performance.

The correlation results revealed that process alignment had a positive but significant relationship with performance of pharmaceutical firms. The regression results showed a coefficient of determination, that is, $R^2$of 69.7% which means that process alignment explains 69.7% of the variations performance of pharmaceutical firms The Null hypothesis was rejected confirming the existence of a significant but positive relationship between process alignment and performance of pharmaceutical firms in Kenya. Many firms have failed due to improper process alignment and could not easily convert their resources and match their process with the standards and customer requirements. Therefore, firms should develop process aligning policies that should be reviewed frequently and aligned to the changing needs of the customers and those of their stakeholders.

5.2.5 Moderating Effect of Inter-Organization Systems on the Relationship between Supply Chain Relationship Management and Performance

The fifth objective of the study was to investigate the moderating effect of inter-organization systems on the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. In Kenya most pharmaceutical firms act as distributors importing directly from manufacturers overseas, arrange shipment of goods from country of origin and customs clearance

and handle the domestic sales of the products. It is highly fragmented pyramidal structure, characterized by poor relationships with a few manufacturers and importers or subsidiaries at the top and a large but undefined number of retailers at the base. However, Inter-organization systems have proved to be of rare importance with most firms integrating them in their operations. Of notable importance is the integration of the electronic customer feedback and inventory management which has improved the performance of the firms. Additionally, electronic coordination, sharing of market information and processing orders electronically is vital in pharmaceutical industry and these practices are highly associated with great performance. The regression results revealed that inter-organization systems moderated the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. The R^2 improved after moderation. This implies that inter-organization systems moderate the relationship between supply chain relationship management and performance of pharmaceutical firms in Kenya. The results imply that the overall effect after moderation is significant. In addition, the F statistic increased.

The Null Hypothesis was rejected implying the existence of mediating inter-organization on performance of pharmaceutical firms in Kenya. The integration of IT systems is good and imperative for any company whether it is operating as a retailer, producer or wholesaler. Therefore, the pharmaceutical management should ensure effective and skilled IT personnel to integrate these practices in the operations of the firms which will aid in improving the performance margins of the firms.

5.3 Conclusions of the Study

The study makes the following conclusions after the findings and results of the study. These are based on the derived hypothesized relationships of the statements on the overall variables on how they influence performance of pharmaceutical firms in Kenya. The conclusions therefore summarize each variable in order of significance in influencing supply chain relationship management on performance of pharmaceutical firms.

The study concluded that collaborative planning has a positive and significant effect on performance of the pharmaceutical firms in Kenya. The involvement of customers

in planning and establishing company strategies in conjunction with collaborative implementation of the plans such as involving customers in marketing activities enhances the performance of the firms. In addition, the company's customer involvements in their daily activities and business continuity plans are key to the continued operations in offering service to their customers and hence improved performance.

Transparency has a positive and significant effect on performance of the pharmaceutical firms and therefore firms should ensure their risks management techniques, timely responses, timely conflict resolutions and credit facilities polices are embedded in their business and the slogan of customer-centric values being upheld and practiced across all departments of the company. In addition, the study concluded that having a visionary leadership style supports information sharing, prudentially resolve customer complaints and conflicts hence performance and thus firms should be careful of their relationships and put in place appropriate strategies of improving Transparency. The main concern that pharmaceutical firms should address is the motivation of the customers which can effectively build the trust and loyalty of the customers and consequently improve the performance of the firms.

The study concluded that Resilience building has a positive and significant effect on performance of pharmaceutical firms. The firms that have put processes in place to ensure resilience in their firms in conjunction to having contingency plans for risks management registered improved performance margins.The firms' resilience building policies and plans clearly identifies the areas susceptible to risks and how they can be mitigated from both external and internal sources of the company's operations. In conclusion, resilience building is sort of risk management strategies where supply chain visibility and adaptability are in place. Resilience building creates efficiency and responsiveness in the supply chain relationship management which are key to the performance of the pharmaceutical firms.

The study concluded that process alignment has a positive and significant effect on performance of the pharmaceutical firms in Kenya. The pharmaceutical firms that that have process alignment polices improve the quality of the products and services

which significantly impacts the performance of pharmaceutical firms in Kenya. Further, acceptable performance standards and appropriate ethics and values within the company enhances the performance of the company. The results concluded that the inclusion of customer in process alignment plans and developments enhances the performance of the pharmaceutical firms.

The study concluded that there is a mediating effect of inter-organization systems on the performance of pharmaceutical firms in Kenya. Integrating information systems and improving the payments and client interactions have strengthened and eased the business processes of the firms making them easily achieve their performance targets. Inter-organizations systems improve the processes of other variables like collaborative planning, process aligning, Transparency, resilience building among others hence contribute to performance improvements.

5.4 Recommendations

In respect to collaborative planning, management in pharmaceutical firms should promote and cultivate a culture which allows collaboration planning forecasting and replenishment (CPFR) with their customers. This is because collaborative planning has been confirmed to have positive and significant effect on firm performance. The firms are therefore recommended to adopt collaborative planning through ways such as joint execution schedules with clients, forecasting, involving customers in joint project teams, involving them in new product development and planning as well as integrating the IT systems. With this, the performance is deemed to improve.

Based on Transparency, the study recommends that organizations should build relationships with their customers based on Transparency since it was found to having a positive and significant relationship with organizational performance. This will enhance brand loyalty to products and promote customer retention

In regard to resilience building, pharmaceutical firms should develop and implement the resilience building practices to increase reliability, visibility, adaptability and build reputable brands. Among the practices which are of great significance are those to do with timely and effective response on new customer customers preferences,

stable and assured supply, innovativeness to new preferences and preparedness to deal with supply disruptions. The study also recommends that management in pharmaceutical firms should implement the aforementioned practices since they lead to an improved firm performance in terms of sales, customer service and efficiency.

Based on study findings, pharmaceutical firms should align their processes with those of the customers. The firms are encouraged to adopt management styles which are compatible with the clients in terms of mission and vision, improve or maintain their delivery standards such as on time and quality delivery, implement marketing strategies which are compatible with customers' standards and or exceed their expectations, and finally the management should strive to meet the customer expectations by improving the characteristics of the products. According to the regression analysis results, these activities enhance the performance of the firm.

In regard to inter-organisation systems, management in pharmaceutical firms should integrate their systems with those of customers such as electronic inventory management, electronic customer feedback; integrate electronic sharing of market information among other IT systems. This is because the study confirmed that integration of IT systems by pharmaceutical companies would lead to improvement in terms of speed and quality services, waste elimination, increased inventory management, responsiveness, accuracy, customer feedback and reduced lead-times.

5.5 Areas for Further Research

Future areas of study should focus on other supply chain management practices since the four that were identified did not account for 100% of the variation in performance. It may also be important to conduct a study to compare the results in other sectors such as the banking sector, listed firms, public institutions and Non-Governmental Institutions. The study tested the linear effect of supply chain management practices on performance with inter-organization systems as the moderator but failed to account for intervening factors.

REFERENCES

Aboobucker, I. & Bao, Y. (2018), "What obstruct customer acceptance of internet banking? Security and privacy, risk, trust and website usability and the role of moderators", *The Journal of High Technology Management Research, 29* (1), 109-123.

Abu, E., Al-Jaroodi, J., Lazarova-Molnar, S. & Mohamed, N. (2014), Simulation and modeling efforts to support decision making in healthcare supply chain management, *The Scientific World Journal*, 2(1),2014,

Ahmad, N., Usman Awan, M., Raouf, A., & Sparks, L. (2009). Development of a service quality scale for pharmaceutical supply chains. *International journal of pharmaceutical and healthcare marketing*, *3*(1) ,26-45.

Ahmed A. , (2015). Testing the effect of marketing strategy alignment and triple-A supply chain on performance in Egypt. *EuroMed Journal of Business*, 10 (2), 163 – 180

Akrout, H. (2015). A process perspective on trust in buyer–supplier relationships."Calculus" An intrinsic component of trust evolution. *European Business Review*, *27*(1), 17-33.

Akrout, H., Diallo, M. F., Akrout, W., & Chandon, J. L. (2016). Affective trust in buyer-seller relationships: a two-dimensional scale. *Journal of Business & Industrial Marketing*, *31*(2), 260-273.

Alan G. J. (2010) German Foundation for World Population (DSW) and Institute for Education in Democracy (IED) ministry of health (2015) National and County Health Budget Analysis

Al-Shboul, M. D. A. (2017). Infrastructure framework and manufacturing supply chain agility: the role of delivery dependability and time to market. *Supply Chain Management: An International Journal*, *22*(2), 172-185.

Anand, V., Glick, W. H., & Manz, C. C. (2002). Thriving on the knowledge of outsiders: Tapping organizational social capital. *Academy of management perspectives*, *16*(1), 87-101.

Arif-Uz-Zaman, K., & Nazmul Ahsan, A. M. M. (2014). Lean supply chain performance measurement. *International Journal of Productivity and Performance Management*, *63*(5), 588-612.

Aronsson, H., Abrahamsson, M., & Spens, K. (2011). Developing lean and agile health care supply chains. *Supply chain management: An international journal*, *16*(3), 176-183.

Arrow, K. (1985). The economics of agency", in Pratt, J. and Zeckhauser, R. (Eds), *Principals and Agents: The Structure of Business*, Harvard University Press, Boston, MA, pp. 37-51.

Asif Salam, M. (2011). Supply chain commitment and business process integration: The implications of Confucian dynamism. *European Journal of Marketing*, *45*(3), 358-382.

Autry, C. W., & Michelle Bobbitt, L. (2008). Supply chain security orientation: conceptual development and a proposed framework. *The International Journal of Logistics Management*, *19*(1),42-64.

Baiman, S., & Rajan, M. V. (2002). Incentive issues in inter-firm relationships. *Accounting, Organizations and Society*, *27*(3), 213-238.

Barasa, P. W., Simiyu, G. M., & Iravo, M. A. (2014). The impact of supply chain collaboration practice on the performance of steel manufacturing companies in Kenya. *European Journal of Logistics Purchasing and Supply Chain Management*, *3*(2), 28-39.

Barnes, B. R., Leonidou, L. C., Siu, N. Y., & Leonidou, C. N. (2015). Interpersonal factors as drivers of quality and performance in Western–Hong Kong inter-

organizational business relationships. *Journal of International Marketing*, *23*(1), 23-49.

Barratt, M., & Oliveira, A. (2001). Exploring the experiences of collaborative planning initiatives. *International Journal of Physical Distribution & Logistics Management*, *31*(4), 266-289.

Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research, and Evaluation*, *18*(1), 6.

Belaya, V., & Henrich Hanf, J. (2009). A multi-theoretical perspective on power in managing inter-organizational relationships. *International Journal of Social Economics*, *36*(11), 1040-1049.

Bergen, M., Dutta, S., & Walker Jr, O. C. (1992). Agency relationships in marketing: A review of the implications and applications of agency and related theories. *The Journal of Marketing*, 1-24.

Bertalanffy, L. V. (1968). General systems theory as integrating factor in contemporary science. *Akten des XIV. Internationalen Kongresses für Philosophie*, *2*, 335-340.

Berut, Z. J. (2020). *Influence of Supply Chain Collaboration on Performance of Dairy Processing Firms in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Bessant, J., Kaplinsky, R., & Lamming, R. (2003). Putting supply chain learning into practice. *International Journal of Operations & Production Management*, *23*(2), 167-184.

Bhakoo, V., & Chan, C. (2011). Collaborative implementation of e-business processes within the health-care supply chain: the Monash Pharmacy

Project. *Supply Chain Management: An International Journal*, *16*(3), 184-193.

Bhakoo, V., & Chan, C. (2011). Collaborative implementation of e-business processes within the health-care supply chain: the Monash Pharmacy Project. *Supply Chain Management: An International Journal*, *16*(3), 184-193.

Bhakoo, V., Singh, P., & Sohal, A. (2012). Collaborative management of inventory in Australian hospital supply chains: practices and issues. *Supply Chain Management: An International Journal*, *17*(2), 217-230.

Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS quarterly*, 169-196.

Bigdeli, A. Z., Kamal, M., & de Cesare, S. (2013). Information sharing through inter- organisational systems in local government. *Transforming Government: People, Process and Policy*.

Blome, C., Schoenherr, T., & Rexhausen, D. (2013). Antecedents and enablers of supply chain agility and its effect on performance: a dynamic capabilities perspective. *International Journal of Production Research*, *51*(4), 1295-1318.

BMI. (2012). *Kenya Pharmaceuticals and Healthcare Report, Q1 2012*. Dublin: Business Monitor International

Bonacich, P. (1987). Power and centrality: A family of measures. *American journal of sociology*, *92*(5), 1170-1182.

Borgström, B., & Hertz, S. (2011). Supply Chain Strategies: Changes in Customer Order- Based Production. *Journal of Business Logistics*, *32*(4), 361-373.

Brandon- Jones, E., Squire, B., Autry, C. W., & Petersen, K. J. (2014). A contingent resource- based perspective of supply chain resilience and robustness. *Journal of Supply Chain Management*, *50*(3), 55-73.

Braunscheidel, M. J., & Suresh, N. C. (2018). Cultivating supply chain agility: Managerial actions derived from established antecedents. In *Supply chain risk management* (pp. 289-309). Springer, Singapore.

Brett Williams(2010) Exploratory factor analysis: A five-step guide for novices**;** *Journal of Emergency Primary Health Care (JEPHC), 8, (3, 2010 - Article 990399*

Brinkhoff, A., Özer, Ö., & Sargut, G. (2015). All You Need Is Trust? An Examination of Inter- organizational Supply Chain Projects. *Production and operations management*, *24*(2), 181-200.

Cao, Z., Huo, B., Li, Y., & Zhao, X. (2015). The impact of organizational culture on supply chain integration: a contingency and configuration approach. *Supply Chain Management: An International Journal*, *20*(1), 24-41.

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research. 1*(2), 245-276.

Chae, B., Yen, H. R., & Sheu, C. (2005). Information technology and supply chain collaboration: moderating effects of existing relationships between partners. *IEEE transactions on engineering management*, *52*(4), 440-448.

Chen, J. S., Tsou, H. T., & Ching, R. K. (2011). Co-production and its effects on service innovation. *Industrial Marketing Management*, *40*(8), 1331-1346.

Child, D. (2006). The essentials of factor analysis. (3rd ed.). New York, NY: Continuum International Publishing Group

Clemons, E. K., Reddi, S. P., & Row, M. C. (1993). The impact of information technology on the organization of economic activity: The "move to the

middle" hypothesis. *Journal of management information systems*, *10*(2), 9-35.

Co, H. C., & Barro, F. (2009). Stakeholder theory and dynamics in supply chain collaboration. *International Journal of Operations & Production Management*, *29*(6), 591-611.

Coleman, J. S. (1990). Foundations of social theory Belknap Press. *Cambridge MA USA*.

Comte, I. A. M., & Bridges, J. H. (1865). A General View of Positivism, Tr.[From Discours Sur l'Ensemble du Positivisme] by JH Bridges.

Cook, K. S., Emerson, R. M., Gillmore, M. R., & Yamagishi, T. (1983). The distribution of power in exchange networks: Theory and experimental results. *American journal of sociology*, *89*(2), 275-305.

Costello, A. B. and J. W. Osborne (2005). Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis. Practical Assessment Research & Evaluation 10(7), 1-9.

Cousins, P. D. (2005). The alignment of appropriate firm and supply strategies for competitive advantage. *International Journal of Operations & Production Management*, *25*(5), 403-428.

Crocitto, M., & Youssef, M. (2003). The human side of organizational agility. *Industrial Management & Data Systems*, *103*(6), 388-397.

Croom, S. (2001). Restructuring supply chains through information channel innovation. *International Journal of Operations & Production Management*, *21*(4), 504-515.

Crossan, F. (2003). Research philosophy: towards an understanding. *Nurse Researcher (through 2013)*, *11*(1), 46.

Curran, C. (1991). Integrated supply chain information systems: The next phase after EDI? *Logistics Information Management*, *4*(1), 18-22.

Daniel Jimenez-Jimenez, Micaela Martínez-Costa, Cristobal Sanchez Rodriguez, (2019) "The mediating role of supply chain collaboration on the relationship between information technology and innovation", *Journal of Knowledge Management*, 23(3), 548-567

Daniel Prajogo, Adegoke Oke, Jan Olhager, (2016) "Supply chain processes: Linking supply logistics integration, supply performance, lean processes and competitive performance", *International Journal of Operations & Production Management,* 36 (2), 220-238

Dayton, D. (2008). Managing China Product Quality: Preventing 'Quality Fade.'. *Smart China Sourcing. com j Global Sources*.

Delbufalo, E. (2012). Outcomes of inter-organizational trust in supply chain relationships: a systematic literature review and a meta-analysis of the empirical evidence. *Supply Chain Management: An International Journal*, *17*(4), 377-402.

Dino Zuppa Svetlana Olbina Raymond Issa , (2016),"Perceptions of trust in the US constructionindustry", *Engineering, Construction and Architectural Management, 23*(2), 211 – 236

Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of management Review*, *20*(1), 65-91.

Dubey, R., Gunasekaran, A. and Childe, S. (2018), "Big data analytics capability in supply chain agility: the moderating effect of organizational flexibility".

Durga Prasad, K. G., Venkata Subbaiah, K., & Narayana Rao, K. (2012). Aligning the competitive strategy with supply chain strategy through QFD. *Journal of Advances in Management Research*, *9*(2), 189-198.

Easton, G., & Araujo, L. (1993, September). A resource based view of industrial networks. In *9th International IMP Seminar. Bath, UK*.

Eckstein, D., Goellner, M., Blome, C. and Henke, M. (2015), The performance impact of supply chain agility and supply chain adaptability: the moderating effect of product complexity. *International Journal of Production Research*, 53(10), 3028-3046.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of management review*, *14*(1), 57-74.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *The Academy of Management Journal*, *50*(1), 25-32.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they?. *Strategic management journal*, *21*(10-11), 1105-1121.

Eksoz, C., Mansouri, S. A., & Bourlakis, M. (2014). Collaborative forecasting in the food supply chain: a conceptual framework. *International Journal of Production Economics*, *158*, 120-135.

Emerson, R. M. (1962). Power-dependence relations. *American sociological review*, 31-41.

Emerson, R. M. (1976). Social exchange theory. *Annual review of sociology*, *2*(1), 335-362.

Euster, S. G. (2016). *Factors Affecting the Performance of Supply Chain Financing In Kenya: A Case Study of Commercial Bank of Africa, Kenya* (Doctoral dissertation, United States International University-Africa).

Evangelia Varoutsa, Robert W. Scapens, (2018) "Trust and control in evolving inter-organisational relationships: Evidence from the aerospace industry", *Accounting, Auditing & Accountability Journal*, *31*(1), 112-140

Farhad Panahifar, P.J. Byrne, Mohammad Asif Salam, Cathal Heavey, (2018). Supply chaincollaboration and firm's performance: The critical role of information sharing and trust", *Journalof Enterprise Information Management, 3*(3),358-379

Fawcet, M. (2014). The Art and Discipline of Strategic Alliances. New York: McGraw-Hill

Fayezi, S., & Zomorrodi, M. (2015). The role of relationship integration in supply chain agility and flexibility development: An Australian perspective. *Journal of Manufacturing Technology Management*, *26*(8), 1126-1157.

Fayezi, S., O'Loughlin, A., & Zutshi, A. (2012). Agency theory and supply chain management: a structured literature review. *Supply chain management: an international journal*, *17*(5), 556-570.

Feng, T., & Zhao, G. (2014). Top management support, inter-organizational relationships and external involvement. *Industrial Management & Data Systems*, *114*(4), 526-549.

Fiedler, F. E. (1987). Fred Fiedler: *The Great writings in management and organizational behavior*, 301.

Field, A. (2009). Discovering Statistics Using SPSS: Introducing Statistical Method (3rd ed.). Thousand Oaks, CA: Sage Publications.

Firer, S., & Mitchell Williams, S. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of intellectual capital*, *4*(3), 348-360.

Fiss, P. C. (2007). A set-theoretic approach to organizational configurations. *Academy of management review*, *32*(4), 1180-1198.

Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, *54*(2), 393-420.

Fleisher, C. S. (1991). Using an agency-based approach to analyze collaborative federated interorganizational relationships. *The Journal of applied behavioral science*, *27*(1), 116-130.

Flynn, B. B., Huo, B., & Zhao, X. (2010). The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of operations management*, *28*(1), 58-71.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative inquiry*, *12*(2), 219-245.

Fowler, D.C. & Goh, B.K. (2012), Retail Category Management, Pearson Prentice Hall, Upper Saddle River, NJ.

Fredrik Karlsson, Ella Kolkowska, Frans Prenkert, (2016) Inter-organisational information security: *a systematic literature review*. *Information & Computer Security*, *24* (5), 418-451

Freeman, R. E. (1999). Divergent stakeholder theory. *Academy of management review*, *24*(2), 233-236.

Friedkin, N.E. (1991), *A Structural Theory of Social Influence*, Cambridge University Press, Cambridge.

Frohlich, M. T. (2002). Techniques for improving response rates in OM survey research. *Journal of Operations Management*, *20*(1), 53-62.

Frohlich, M. T., & Westbrook, R. (2001). Arcs of integration: an international study of supply chain strategies. *Journal of operations management*, *19*(2), 185-200.

Frohlich, M. T., & Westbrook, R. (2002). Demand chain management in manufacturing and services: web-based integration, drivers and performance. *Journal of Operations Management*, *20*(6), 729-745.

Frost & Sullivan, (2013). *Innovative Brands Remain Robust within Kenya's Private Pharmaceutical Market*. Cape Town: Frost and Sullivan Africa Healthcare Unit.

Gadde, L-E., Håkansson, H. & Persson, G. (2010), *Supply Network Strategies*, second edition, John Wiley & Sons, Hoboken.

Giddens, A. (1984). The Constitution of Society, University of California Press, Berkeley CA.

Gligor, D. M., & Holcomb, M. C. (2012). Antecedents and consequences of supply chain agility: establishing the link to firm performance. *Journal of Business Logistics*, *33*(4), 295-308.

Goldsby, T. J., Griffis, S. E., & Roath, A. S. (2006). Modeling lean, agile, and leagile supply chain strategies. *Journal of business logistics*, *27*(1), 57-80.

Goswami, D., Boon-Itt, S., Jain, N., & Agarwal, D. R. (2016). Communication drivers for drug adoption in an uncertain world. *International Journal of Pharmaceutical and Healthcare Marketing*, *10*(1), 75-103.

Goyal, V., & Mishra, P. (2016). A framework for performance evaluation of channel partners in distribution relationships. *International Journal of Productivity and Performance Management*, *65*(4), 503-531.

Granovetter, M. (1973), The strengths of weak ties", *American Journal of Sociology*, *78*(6), 1360-1380.

Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American journal of sociology*, *91*(3), 481-510.

Granovetter, M. (1992). Economic institutions as social constructions: a framework for analysis. *Acta sociologica*, *35*(1), 3-11.

Grant, R. M. (1999). The resource-based theory of competitive advantage: implications for strategy formulation. In *Knowledge and strategy* (pp. 3-23).

Green Jr, K. W., Whitten, D., & Inman, R. A. (2012). Aligning marketing strategies throughout the supply chain to enhance performance. *Industrial Marketing Management*, *41*(6), 1008-1018.

Griffith, D. A., Harvey, M. G., & Lusch, R. F. (2006). Social exchange in supply chain relationships: The resulting benefits of procedural and distributive justice. *Journal of operations management*, *24*(2), 85-98.

Guan, W., & Rehme, J. (2012). Vertical integration in supply chains: driving forces and consequences for a manufacturer's downstream integration. *Supply Chain Management: An International Journal*, *17*(2), 187-201.

Haakansson, H. and Snehota, I. (1995), *Developing Relationships in Business Networks*, Routledge, London.

Habib, M. M., Pathik, B. B., & Maryam, H. (2014). *Research methodology-contemporary practices: guidelines for academic researchers*. Cambridge Scholars Publishing.

Håkansson, H. (1987). Industrial technological development: a network approachCroom Helm. *International journal of research in marketing*, *4*(2), 157-159.

Håkansson, H., & Ford, D. (2002). How should companies interact in business networks?. *Journal of business research*, *55*(2), 133-139.

Hall, D. J., Skipper, J. B., Hazen, B. T., & Hanna, J. B. (2012). Inter-organizational IT use, cooperative attitude, and inter-organizational collaboration as antecedents to contingency planning effectiveness. *The International Journal of Logistics Management*, *23*(1), 50-76.

Halldórsson, A., & Skjøtt-Larsen, T. (2004). Developing logistics competencies through third party logistics relationships. *International Journal of Operations & Production Management*, *24*(2), 192-206.

Hammervoll, T., Jensen, L. M., & Beske, P. (2017). Dynamic capabilities and sustainable supply chain management. *International journal of physical distribution & logistics management*.

Handfield, R.B.& Nichols, E.L. (1999), *Introduction to Supply Chain Managemen*t, Prentice Hall, Upper Saddle River, NJ.

Haque, M., & Islam, R. (2013). Effects of supply chain management practices on customer satisfaction: Evidence from pharmaceutical industry of Bangladesh. *Global Business and Management Research*, *5*(2/3), 120.

Hartono, E., Li, X., Na, K. S., & Simpson, J. T. (2010). The role of the quality of shared information in interorganizational systems use. *International Journal of Information Management*, *30*(5), 399-407.

Hastings, K., Howieson, J., & Lawley, M. (2016). Creating value chains: the role of relationship development. *British Food Journal*, *118*(6), 1384-1406.

Hearnshaw, E. J., & Wilson, M. M. (2013). A complex network approach to supply chain network theory. *International Journal of Operations & Production Management*, *33*(4), 442-469.

Hillebrand, B., & Biemans, W. G. (2011). Dealing with downstream customers: an exploratory study. *Journal of Business & Industrial Marketing*, *26*(2), 72-80.

Hinkka, V., Främling, K., & Tätilä, J. (2013). Supply chain tracking: aligning buyer and supplier incentives. *Industrial Management & Data Systems*, *113*(8), 1133-1148.

Holmstrom, B., & Milgrom, P. (1987). Aggregation and linearity in the provision of intertemporal incentives. *Econometrica: Journal of the Econometric Society*, 303-328.

Huang, M. C., Yen, G. F., & Liu, T. C. (2014). Reexamining supply chain integration and the supplier's performance relationships under uncertainty. *Supply Chain Management: An International Journal*, *19*(1), 64-78.

Huang, S. H., Uppal, M., & Shi, J. (2002). A product driven approach to manufacturing supply chain selection. *Supply Chain Management: An International Journal*, *7*(4), 189-199.

Hudnurkar, M., Jakhar, S., & Rathod, U. (2014). Factors affecting collaboration in supply chain: a literature review. *Procedia-Social and Behavioral Sciences*, *133*, 189-202.

Hung Lau, K. (2012). Demand management in downstream wholesale and retail distribution: a case study. *Supply Chain Management: An International Journal*, *17*(6), 638-654

Hunter, T. S., Droege, M., Marsh, W. A., & Droege, W. L. (2005). Effectively managing pharmaceutical returns and waste. *Drug Topics*, *149*(2), 36-43.

Huo, B. (2012). The impact of supply chain integration on company performance: an organizational capability perspective. *Supply Chain Management: An International Journal*, *17*(6), 596-610.

Ilmudeen, A., Bao, Y., & Alharbi, I. M. (2019). How does business-IT strategic alignment dimension impact on organizational performance measures. *Journal of Enterprise Information Management*.

Imenda, S. (2014). Is there a conceptual difference between theoretical and conceptual frameworks?. *Journal of Social Sciences*, *38*(2), 185-195.

IMS Health Market Prognosis (2010). Retrieved from http://www.imshealth.comDeloof M. (2003). "Does Working Capital Management Affect Profitability of Belgian Firms*?*, *Journal of Business & Accounting*, *3*,, 3-4

International Anti-Counterfeiting Coalition, (2009), The Impact of Counterfeit Products on the performance of Pharmaceutical Firms, New York, USA.

International trade administration (ITA) (2016). Top market report pharmaceuticals, department of commerce, USA

Ivy S.N. Chen, Patrick K.O. Fung, Simon S.M. Yuen, (2019) Dynamic capabilities of logistics service providers: antecedents and performance implications. *Asia Pacific Journal of Marketing and Logistics,*

Jaidka, K., Khoo, C. S., & Na, J. C. (2013, March). Literature review writing: how information is selected and transformed. In *Aslib Proceedings,65* (3), 303-325

Hauke, J., & Kossowski, T. (2011). Comparison of values of Pearson's and Spearman's correlation coefficient on the same sets of data.

Jean, R. J. B., Sinkovics, R. R., & Hiebaum, T. P. (2014). The Effects of Supplier Involvement and Knowledge Protection on Product Innovation in Customer–Supplier Relationships: A Study of Global Automotive Suppliers in China. *Journal of Product Innovation Management*, *31*(1), 98-113.

Johanson, J., & Mattsson, L. G. (1987). Interorganizational relations in industrial systems: a network approach compared with the transaction-cost approach. *International Studies of Management & Organization*, *17*(1), 34-48.

Jordana Marques Kneipp, Clandia Maffini Gomes, Roberto Schoproni Bichueti, Kamila Frizzo, Ana Paula Perlin, (2019) Sustainable innovation practices and their relationship with the performance of industrial companies. *Revista de Gestão, 26*(2) 94-111

Kachigan, S. K. (1991). *Multivariate statistical analysis: A conceptual introduction* (2nd ed.). New York: Radius Press.

Kamel A. Fantazy, Syed Awais Ahmad Tipu, Vinod Kumar, (2016). Conceptualizing the relative openness of supply chain and its impact on organizational performance. *Benchmarking*: *An International Journal, 23*(5), 1264-1285

Kanyanya, C. (2013). *Lean Manufacturing Practices and Performance of Organizations listed at the Nairobi Securities Exchange*. Unpublished MBA Project, University of Nairobi.

Kariithi, J. N., & Kihara, A. (2017). Factors affecting performance of manufacturing firms in Kenya: A case of pharmaceutical firms in Nairobi County. *Strategic Journal of Business & Change Management, 4(2)*.

Kauremaa, J., & Tanskanen, K. (2016). Designing interorganizational information systems for supply chain integration: a framework. *The International Journal of Logistics Management*, *27*(1), 71-94.

Kaushik, A. (2009). Inter-organisational systems in a consumer packaged goods network: Case of Godrej Consumer Products Limited (GCPL). *Vision*, *13*(1), 79-96.

Ke, J. Y. F., Windle, R. J., Han, C., & Britto, R. (2015). Aligning supply chain transportation strategy with industry characteristics: Evidence from the US-Asia supply chain. *International Journal of Physical Distribution & Logistics Management*, *45*(9/10), 837-860.

Kenya Association of Manufacturers, (2010), Impact of Counterfeits in the Kenyan Economy and Industries, Nairobi, Kenya.

Ketchen Jr, D. J., & Hult, G. T. M. (2007). Bridging organization theory and supply chain management: The case of best value supply chains. *Journal of operations management*, *25*(2), 573-580.

Khalid, N., Islam, D. M. Z., & Ahmed, M. R. M. (2019). Sentrepreneurial Training and Organizational Performance: Implications for Future. *Humanities & Social Sciences Reviews*, *7*(2), 590-593.

Khan, O., Christopher, M., & Creazza, A. (2012). Aligning product design with the supply chain: a case study. *Supply Chain Management: An International Journal*, *17*(3), 323-336.

Khanna, I. (2012). Drug discovery in pharmaceutical industry: productivity challenges and trends. *Drug discovery today*, *17*(19-20), 1088-1102.

Koka, B. R., & Prescott, J. E. (2002). Strategic alliances as social capital: A multidimensional view. *Strategic management journal*, *23*(9), 795-816.

Krishnapriya, V., & Baral, R. (2014). Supply chain integration-a competency based perspective. *International Journal of Managing Value and Supply Chains*, *5*(3), 45.

Krishnapriya, V., & Baral, R. (2014). Supply chain integration-a competency based perspective. *International Journal of Managing Value and Supply Chains*, *5*(3), 45.

Kumar, G., & Nath Banerjee, R. (2012). Collaboration in supply chain: An assessment of hierarchical model using partial least squares (PLS). *International Journal of Productivity and Performance Management*, *61*(8), 897-918.

Kumar, G., & Nath Banerjee, R. (2014). Supply chain collaboration index: an instrument to measure the depth of collaboration. *Benchmarking: An International Journal*, *21*(2), 184-204.

Kumar, G., Banerjee, R. N., Meena, P. L., & Ganguly, K. (2016). Collaborative culture and relationship strength roles in collaborative relationships: a supply chain perspective. *Journal of Business & Industrial Marketing*, *31*(5), 587-599.

Kumar, K., & Van Dissel, H. G. (1996). Sustainable collaboration: managing conflict and cooperation in interorganizational systems. *Mis Quarterly*, 279-300

Kumar, S., Dieveney, E., & Dieveney, A. (2009). Reverse logistic process control measures for the pharmaceutical industry supply chain. *International Journal of Productivity and Performance Management*, *58*(2), 188-204.

Lai, F., Zhang, M., Lee, D. M., & Zhao, X. (2012). The impact of supply chain integration on mass customization capability: an extended resource-based view. *IEEE Transactions on Engineering Management*, *59*(3), 443-456.

Laínez, J. M., Schaefer, E., & Reklaitis, G. V. (2012). Challenges and opportunities in enterprise-wide optimization in the pharmaceutical industry. *Computers & Chemical Engineering*, *47*, 19-28.

Ledesma, R. D. and P. Valero-Mora (2007)."Determining the Number of Factors to Retain in EFA: an easy-to-use computer program for carrying out Parallel Analysis." Practical Assessment, *Research & Evaluation 12*(2),1-2

Lee, S. M., & Rha, J. S. (2016). Ambidextrous supply chain as a dynamic capability: building a resilient supply chain. *Management Decision*, *54*(1), 2-23.

Levy, M., Powell, P., & Yetton, P. (2011). Contingent dynamics of IS strategic alignment in small and medium-sized enterprises. *Journal of Systems and Information Technology*, *13*(2), 106-124.

Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, *34*(2), 107-124.

Li, X., Wu, Q., & Holsapple, C. W. (2015). Best-value supply chains and firms' competitive performance: empirical studies of their linkage. *International Journal of Operations & Production Management*, *35*(12), 1688-1709.

Li, X., Wu, Q., Holsapple, C. W., & Goldsby, T. (2017). An empirical examination of firm financial performance along dimensions of supply chain resilience. *Management Research Review*, *40*(3), 254-269.

Lin, N. (2001), Social Capital: A Theory of Social Structure and Action, *Cambridge University Press*, New York, NY.

Lockström, M., Schadel, J., Harrison, N., Moser, R., & Malhotra, M. K. (2010). Antecedents to supplier integration in the automotive industry: a multiple-case study of foreign subsidiaries in China. *Journal of Operations Management*, *28*(3), 240-256.

Logan, M. S. (2000). Using agency theory to design successful outsourcing relationships. *The International Journal of Logistics Management*, *11*(2), 21-32.

Luhmann, N., Baecker, D., & Gilgen, P. (2013). *Introduction to systems theory*. Cambridge: Polity.

Luo, B.N. and Yu, K. (2016), Fits and misfits of supply chain flexibility to environmental uncertainty: two types of asymmetric effects on performance. *The International Journal of Logistics Management*, *27*(3) 862-885.

M. Gligor, D., & Holcomb, M. (2013). The role of personal relationships in supply chains: An exploration of buyers and suppliers of logistics services. *The International Journal of Logistics Management*, *24*(3), 328-355.

Mabert, V. A., & Venkataramanan, M. A. (1998). Special research focus on supply chain linkages: challenges for design and management in the 21st century. *Decision Sciences*, *29*(3), 537-552.

Magenda, J. (2014). *Determinants of supply chain performance among commercial banks in Kenya* (Doctoral dissertation, University Of Nairobi).

Mahajan, V., Nauriyal, D. K., & Singh, S. P. (2015). Trade performance and revealed comparative advantage of Indian pharmaceutical industry in new IPR regime. *International Journal of Pharmaceutical and Healthcare Marketing*, *9*(1), 56-73.

Michalski, Marek, Montes, Jose Luis & Narasimhan, Ram (2019) "Relational asymmetry, trust, and innovation in supply chain management: a non-linear approach", *The International Journal of Logistics Management*, *30*(1) 303-328,

Drakaki, M., & Tzionas, P. (2019). Investigating the impact of inventory inaccuracy on the bullwhip effect in RFID-enabled supply chains using colored Petri nets. *Journal of Modelling in Management*.

Markovsky, B., Skvoretz, J., Willer, D., Lovaglia, M. J., & Erger, J. (1993). The seeds of weak power: An extension of network exchange theory. *American Sociological Review*, 197-209.

Marshall, L. F. (1997). What is the right supply chain for your product? A simple framework can help you figure out the answer. *Harvard Business Review*, *3*, 105-116.

Martin, D. (2014). Towards a model of trust. *Journal of Business Strategy*, *35*(4), 45-51.

Mathews, J. A. (2003). Competitive dynamics and economic learning: an extended resource- based view. *Industrial and Corporate Change*, *12*(1), 115-145.

McAdam, R., Hazlett, S. A., & Galbraith, B. (2014). The role of performance measurement models in multi-level alignment: An exploratory case analysis in the utilities sector. *International Journal of Operations & Production Management*, *34*(9), 1153-1183.

McGrath, R. & Sparks, W.L. (2005), The importance of building social capital, *Quality Progress*, *38*(22), 45-90.

McKinsey & Company, (2015) Insights into Pharmaceuticals and Medical Products. USA

Mehralian, G., A. Nazari, J., Akhavan, P., & Reza Rasekh, H. (2014). Exploring the relationship between the knowledge creation process and intellectual capital in the pharmaceutical industry. *The Learning Organization*, *21*(4), 258-273.

Menguc, B., Auh, S., & Yannopoulos, P. (2014). Customer and supplier involvement in design: The moderating role of incremental and radical innovation capability. *Journal of Product Innovation Management*, *31*(2), 313-328.

Mihalis Giannakis, Michalis Louis, (2016). A multi-agent based system with big data processing for enhanced supply chain agility. *Journal of Enterprise Information Management, 29*(I5), 706-727

Miles, R. E., & Snow, C. C. (2007). Organization theory and supply chain management: An evolving research perspective. *Journal of operations management*, *25*(2), 459-463.

Min, H. (2015). *The essentials of supply chain management: New business concepts and applications*. FT Press.

Ministry of Medical Services; Ministry of Medical Services Strategic Plan 2008 – 2012

Mirkovski, K., Lowry, P. B., & Feng, B. (2016). Factors that influence interorganizational use of information and communications technology in relationship-based supply chains: evidence from the Macedonian and American wine industries. *Supply Chain Management: An International Journal*, *21*(3), 334-351.

Mitev, N. N. (1996). Empowerment, change and information technology: socio-technical design and business process re-engineering. *Personnel Review*, *25*(4), 56-66.

Mitnick, B. (1973), Fiduciary rationality and public policy: the theory of agency and some consequences, *paper presented at the Annual Meeting of the American Political Science Association*, New Orleans, LA.

Mokadem, M. (2016). ISO 9000 moderation role over supply chain alignment in manufacturing context. *Journal of Manufacturing Technology Management*, *27*(3), 338-363.

Montoya-Torres, J. R., & Ortiz-Vargas, D. A. (2014). Collaboration and information sharing in dyadic supply chains: A literature review over the period 2000–2012. *Estudios Gerenciales*, *30*(133), 343-354.

Mudambi, R., & Navarra, P. (2015). Is knowledge power? Knowledge flows, subsidiary power and rent-seeking within MNCs. In *The Eclectic Paradigm* (pp. 157-191). Palgrave Macmillan, London.

Muthoni, A. B. (2015). *Supply chain integration and performance of pharmaceutical firms in Kenya* (Doctoral dissertation, University of Nairobi).

Nagashima, M., Wehrle, F. T., Kerbache, L., & Lassagne, M. (2015). Impacts of adaptive collaboration on demand forecasting accuracy of different product categories throughout the product life cycle. *Supply chain management: an international journal*, *20*(4), 415-433.

Najmi, A. and Khan, A.A. (2017), "Does supply chain involvement improve the new product development performance? A partial least square-structural equation modelling approach", *International Journal of Advanced Operations Management, 9(2), 122-141.*

Nasina, J., & Nallam, S. N. R. (2016). Analysis of cost escalations in pharmaceutical projects. *International Journal of Managing Projects in Business*, *9*(2), 433-450.

Nyang'au, F. O. (2017). *Influence Of Supply Chain Risk Management Strategies On Performance Of Food And Beverage Manufacturing Firms In Kenya* (Doctoral Dissertation, Jkuat Cohred).

Ochieng, A. O. (2018). *Supply Chain Resilience and Organizational Performance of Pharmaceutical Manufacturing Companies in Nairobi* (Doctoral dissertation, university of Nairobi).

Odhon'g, E. A., & Omolo, J. (2015). Effect of human capital investment on organizational performance of pharmaceutical companies in Kenya. *Global Journal of Human Resource Management*, *3*(6), 1-29.

Ogulin, R., Selen, W., & Ashayeri, J. (2012). Determinants of informal coordination in networked supply chains. *Journal of Enterprise Information Management*, *25*(4), 328-348.

Okore, C. A., & Kibet, Y. (2019). Influence of information sharing on supply chain performance in the tourism industry in the county government of Kakamega, Kenya. *The Strategic Journal of Business & Change Management*, *6*(2), 66-81.

Olesen, K., & Myers, M. D. (1999). Trying to improve communication and collaboration with information technology: an action research project which failed. *Information Technology & People*, *12*(4), 317-332.

Oliver, C. (1990). Determinants of inter-organizational relationships: Integration and future directions. *Academy of management review*, *15*(2), 241-265.

Pagell, M. (2004). Understanding the factors that enable and inhibit the integration of operations, purchasing and logistics. *Journal of operations management*, *22*(5), 459-487.

Paul Gray and JongbokByun(2012), *Customer Relationship management Center For Research on Information Technology And Organizations*, University Of California, Irvine 3200 Berkeley Place Irvine, Ca, 92697-4650. Retrieved from http://www.Crito.Uci.Edu

Penrose, E. (1959). *The Theory of the Growth of the Firm*, Billing & Sons, London

Pettit, T. J., Croxton, K. L., & Fiksel, J. (2013). Ensuring supply chain resilience: development and implementation of an assessment tool. *Journal of business logistics*, *34*(1), 46-76.

Pfeffer, J. & Salancik, G. R. (1978). *The external control of organizations: A resource dependence approach.* NY: Harper and Row Publishers.

Pierre Ambroise-Thomas 2012 The Tragedy Caused by Fake Antimalarial Drugs *Mediterranean journal of hematology and infectious diseases*

Pinna, R., Carrus, P. P., & Marras, F. (2015). The drug logistics process: an innovative experience. *The TQM Journal*, *27*(2), 214-230.

Pomponi, F., Fratocchi, L., & Rossi Tafuri, S. (2015). Trust development and horizontal collaboration in logistics: a theory based evolutionary framework. *Supply Chain Management: An International Journal*, *20*(1), 83-97.

Porter, M.E. & Lee, T.H. (2013), The strategy that will fix health care. *Harvard Business Review*, October, pp. 3-19.

Porter, M.E. (1980), *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, Chapter 1, The Free Press, New York, NY.

Prahalad, C. & Hamel, G. (1990). The core competence of the corporation, *Harvard Business Review*,68 (3) 79-91.

Prajogo, D. & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. *International Journal of Production Economics*, *135*(1), 514-522.

Private Sector Innovation Programme for Health (PSP4H) 2014: Overview of Experiences in the Pharmaceutical Supply Chain: Implications for the poor in Kenya

Pule, S., & Kalinzi, C. (2014). Relationship management in downstream supply chain: A predictor of performance among selected pharmaceutical companies in kampala, uganda. *International Journal of Managing Value and Supply Chains*, *5*(3), 61

Qi, Y., Zhao, X., & Sheu, C. (2011). The impact of competitive strategy and supply chain strategy on business performance: the role of environmental uncertainty. *Decision Sciences*, *42*(2), 371-389

R. Artusi1 , P. Verderio, E. Marubini (2002) Bravais-Pearson and Spearman correlation coefficients: meaning, test of hypothesis and confidence interval, the *International Journal of Biological Markers, 17*(2), 148-151

Rajesh, O., Chan, Y. E., & Newson, E. P. (2012). Leading the development and implementation of collaborative interorganizational systems. *Information & Management*, *35*(2), 63-75.

Ramanathan, U. (2013). Aligning supply chain collaboration using Analytic Hierarchy Process. *Omega*, *41*(2), 431-440.

Ramanathan, U. (2014). Performance of supply chain collaboration–A simulation study. *Expert Systems with Applications*, *41*(1), 210-220.

Ramish, A., & Aslam, H. (2016). Measuring supply chain knowledge management (SCKM) performance based on double/triple loop learning principle. *International Journal of Productivity and Performance Management*, *65*(5), 704-722.

Rasekh, H. R., Mehralian, G., & Vatankhah-Mohammadabadi, A. A. (2012). Situation analysis of R & D activities: an empirical study in Iranian pharmaceutical companies. *Iranian journal of pharmaceutical research: IJPR*, *11*(4), 1013.

Ratnatunga, J. (2011). Future Imperfect–Investing in Supply Chain Capabilities. *Marketing Review St. Gallen*, *28*(3), 39-47.

Rihoux, B. & Ragin, C.C. (Eds) (2009), *Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques*, Sage, Thousand Oaks, CA. Snow, C.C. and Miles

Robert, M. M. & Shukran, M. (2012). The pharmaceutical industry and access to essential medicines in Tanzania, Institute of Social and Economic Research, Rhodes University, Southern and Eastern African Trade Information and Negotiation Institute (SEATINI), Training and Research Support Centre in the Regional Network for Equity in Health in East

Romano, P., & Vinelli, A. (2001). Quality management in a supply chain perspective: strategic and operative choices in a textile-apparel network. *International Journal of Operations & Production Management*, *21*(4), 446-460.

Rompho, N., & Boon-itt, S. (2012). Measuring the success of a performance measurement system in Thai firms. *International Journal of Productivity and Performance Management*, *61*(5), 548-562.

Ross, S. A. (1973). The economic theory of agency: The principal's problem. *The American Economic Review*, *63*(2), 134-139

Ross, S. A. (1979). Equilibrium and Agency--Inadmissible Agents in the Public Agency Problem. *The American Economic Review*, *69*(2), 308-312

Roya Dehgani, Nima Jafari Navimipour, (2019) "The impact of information technology and communication systems on the agility of supply chain management systems", Kybernetes

Rubenstein-Montano, B., Liebowitz, J., Buchwalter, J., McCaw, D., Newman, B., Rebeck, K., & Team, T. K. M. M. (2001). A systems thinking framework for knowledge management. *Decision support systems*, *31*(1), 5-16

Rummel, R.J. (1970). Applied factor analysis. Evanston, IL: Northwestern University Press

Salancik, G. R. (1995). Wanted: A good network theory of organization.

Sambasivan, M., Siew-Phaik, L., Abidin Mohamed, Z., & Choy Leong, Y. (2011). Impact of interdependence between supply chain partners on strategic alliance outcomes: Role of relational capital as a mediating construct. *Management Decision*, *49*(4), 548-569

Sardana, D., Terziovski, M. and Gupta, N. (2016), The impact of strategic alignment and responsiveness to market on manufacturing firm's performance. *International Journal of Production Economics, Vol. 177*(1) 131-138

Schlange, L. E. (1995). Linking futures research methodologies: an application of systems thinking and metagame analysis to nuclear energy policy issues. *Futures*, *27*(8), 823-838

Senge, P. M. (1990), *The Fifth Discipline,* Doubleday Currency, New York, NY

SESRIC (2011). Pharmaceutical industry production, consumption and trade. Retrieved from http://www.sesric.org/files/article/433.pdf

Shabaninejad, H., Mehralian, G., Rashidian, A., Baratimarnani, A., & Rasekh, H. R. (2014). Identifying and prioritizing industry-level competitiveness factors: evidence from pharmaceutical market. *DARU Journal of Pharmaceutical Sciences*, *22*(1), 35

Shabaninejad, H., Mirsalehian, M. H., & Mehralian, G. (2014). Development of an integrated performance measurement (PM) model for pharmaceutical industry. *Iranian journal of pharmaceutical research: IJPR*, *13*(207)

Sharma, N., Young, L. C., & Wilkinson, I. (2015). The nature and role of different types of commitment in inter-firm relationship cooperation. *Journal of Business & Industrial Marketing*, *30*(1), 45-59.

Shradha Ashok Gawankar, Sachin Kamble, Rakesh Raut, (2017). An investigation of the relationship between supply chain management practices (SCMP) on

supply chain performance measurement (SCPM) of Indian retail chain using SEM. *Benchmarking*: *An International Journal*, *24(*1) 257-295

Sik Jeong, J., & Hong, P. (2007). Customer orientation and performance outcomes in supply chain management. *Journal of Enterprise Information Management*, *20*(5), 578-594

Silvestro, R., & Lustrato, P. (2014). Integrating financial and physical supply chains: the role of banks in enabling supply chain integration. *International journal of operations & production management*, *34*(3), 298-324

Sing K. Singh, (2011) "Developing the framework for coordination in supply chain of SMEs", *Business Process Management Journal*, *17*(4) 619-638

Singh, R. K. (2011). Developing the framework for coordination in supply chain of SMEs. *Business Process Management Journal*, *17*(4), 619-638

Singh, R. K. (2015). Modelling of critical factors for responsiveness in supply chain. *Journal of Manufacturing Technology Management*, *26*(6), 868-888.

Singh, R. K., Kumar, R., & Kumar, P. (2016). Strategic issues in pharmaceutical supply chains: a review. *International Journal of Pharmaceutical and Healthcare Marketing*, *10*(3), 234-257

Singh, U., & Srivastava, K. B. (2016). Organizational trust and organizational citizenship behaviour. *Global Business Review*, *17*(3), 594-609.

Sinha, A., Swati, P. and Anand, A. (2015). Responsive supply chain: modeling and simulation. *Management Science Letters*, 5(6) 639-650

Skipworth, H., Godsell, J., Wong, C. Y., Saghiri, S., & Julien, D. (2015). Supply chain alignment for improved business performance: an empirical study. *Supply Chain Management: An International Journal*, *20*(5), 511-533

Skipworth, H., Godsell, J., Wong, C. Y., Saghiri, S., & Julien, D. (2015). Supply chain alignment for improved business performance: an empirical

study. *Supply Chain Management: An International Journal*, *20*(5), 511-533.

Song, H., Yu, K., Chatterjee, S. R., & Jia, J. (2016). Service supply chain: strategic interaction and relationship value. *Journal of Business & Industrial Marketing*, *31*(5), 611-624

Starbird, S. A. (2001). Penalties, rewards, and inspection: provisions for quality in supply chain contracts. *Journal of the Operational Research Society*, *52*(1), 109-115

Starbird, S.A. (2003). The effect of coordinated replenishment on quality. *Journal of The Operational Research Society*, 54(1) 32-9.

Stefan Grunwald-Delitz, Erik Strauss, Juergen Weber, (2019) Governing day-to-day interactions in the execution phase of an interfirm collaboration: The role of informal controls. *Qualitative Research in Accounting & Management*,

Stern, L. W., & Reve, T. (1980). Distribution channels as political economies: a framework for comparative analysis. *The Journal of Marketing*, 52-64.

Stevens, G.C. and Johnson, M. (2016), "Integrating the supply chain … 25 years on", *International Journal of Physical Distribution & Logistics Management*, 46 (1)19-42.

Svendsen, M.F., Haugland, S.A., Grønhaug, K. and Hammervoll, T. (2011), Marketing strategy and customer involvement in product development, *European Journal of Marketing*, 45 (4) 513-530.

Svensson, G. (2000), A conceptual framework for the analysis of vulnerability in supply chains, *International Journal of Physical Distribution & Logistics Management*, 30 (9) 731-49.

Swatman, P. M., Swatman, P. A., & Fowler, D. C. (1994). A model of EDI integration and strategic business reengineering. *The Journal of Strategic Information Systems*, *3*(1), 41-60.

Tabachnick , B. G., & Fidell, L. S. (2001). Using multivariate statistics (4th ed.) Needham Heights., MA: Pearson

Tarafdar, M. and Qrunfleh, S. (2016). Agile supply chain strategy and supply chain performance: complementary roles of supply chain practices and information systems capability for agility. *International Journal of Production Research, 55(4) 1-14*.

Tarn, J. M., Yen, D. C., & Beaumont, M. (2002). Exploring the rationales for ERP and SCM integration. *Industrial Management & Data Systems*, *102*(1), 26-34.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal*, *18*(7), 509-533.

Tejpal, G., Garg, R. K., & Sachdeva, A. (2013). Trust among supply chain partners: a review. *Measuring Business Excellence*, *17*(1), 51-71.

Teller, C., Kotzab, H., Grant, D. B., & Holweg, C. (2016). The importance of key supplier relationship management in supply chains. *International Journal of Retail & Distribution Management*, *44*(2), 109-123.

Thun, J. H. (2010). Angles of integration: an empirical analysis of the alignment of internet- based information technology and global supply chain integration. *Journal of Supply Chain Management*, *46*(2), 30-44.

Tipu, S. A. A., & Fantazy, K. A. (2014). Supply chain strategy, flexibility, and performance: a comparative study of SMEs in Pakistan and Canada. *The International Journal of Logistics Management*, *25*(2), 399-416.

Trist, E. L. (1981). *The evolution of socio-technical systems* (Vol. 2). Toronto: Ontario Quality of Working Life Centre.

Trombetta, B. (2010). Category captain management: an idea whose time has come in the pharmaceutical industry? *International Journal of Pharmaceutical and Healthcare Marketing*, *4*(2), 157-174.

Tsanos, C., G. Zografos, K., & Harrison, A. (2014). Developing a conceptual model for examining the supply chain relationships between behavioural antecedents of collaboration, integration and performance. *The International Journal of Logistics Management*, *25*(3), 418-462.

Tsinopoulos, C., & Al-Zu'bi, Z. B. (2012). Clockspeed effectiveness of lead users and product experts. *International Journal of Operations & Production Management*, *32*(9), 1097-1118.

Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionist approach. *Strategic management journal*, *17*(S2), 11-25.

Um, J., Han, N., Grubic, T. and Ghalib, A. (2018), Aligning product variety with supply chain and business strategy. *International Journal of Productivity and Performance Management, 67(9) 1837-1853,*

UNIDO (2012), Pharmaceutical Sector Profile Kenya, Pharmaceutical Sector Profile Kenya

Usha R., Angappa, G., & Nachiappan, S., (2011). Supply chain collaboration performance metrics: a conceptual framework, Benchmarking: *An International Journal,* 18 (6) 856 – 872

Valmohammadi, C., & Servati, A. (2011). Performance measurement system implementation using Balanced Scorecard and statistical methods. *International Journal of Productivity and Performance Management*, *60*(5), 493-511.

van der Vaart, T., Pieter van Donk, D., Gimenez, C., & Sierra, V. (2012). Modelling the integration-performance relationship: Collaborative practices, enablers and contextual factors. *International Journal of Operations & Production Management*, *32*(9), 1043-1074.

Van Grembergen, W. and De Haes, S. (2017). Introduction to IT governance and its mechanisms minitrack. Paper presented at the Proceedings of the 50th HI International Conference on System Sciences.

Venkatraman, N. (1994). IT-enabled business transformation: from automation to business scope redefinition. *Sloan management review*, *35*, 73-73.

Vickery, S. K., Jayaram, J., Droge, C., & Calantone, R. (2003). The effects of an integrative supply chain strategy on customer service and financial performance: an analysis of direct versus indirect relationships. *Journal of operations management*, *21*(5), 523-539.

Wafula, E., & George, O. (2015). Effects of strategic supplier partnership on firm performance in the energy sector: *a case study of Kenya Pipeline Company limited.*

Wallace, S. W., & Choi, T. M. (2011). Flexibility, information structure, options, and market power in robust supply chains. *International Journal of Production Economics*, *134*(2), 284-288.

Waqar Ahmed, Arsalan Najmi, Yusra Mustafa, Asif Khan, (2019) "Developing model to analyze factors affecting firms' agility and competitive capability: A case of a volatile market", *Journal of Modelling in Management, 14(*2)476-491,

Whipple, J. M., & Roh, J. (2010). Agency theory and quality fade in buyer-supplier relationships. *The International Journal of Logistics Management*, *21*(3), 338-352.

Whitchurch, G. G., & Constantine, L. L. (2009). Systems theory. In *Sourcebook of family theories and methods* (pp. 325-355). Springer, Boston, MA.

Wieland, A., & Marcus Wallenburg, C. (2013). The influence of relational competencies on supply chain resilience: a relational view. *International Journal of Physical Distribution & Logistics Management*, *43*(4), 300-320.

Wieland, A., & Marcus Wallenburg, C. (2013). The influence of relational competencies on supply chain resilience: a relational view. *International Journal of Physical Distribution & Logistics Management*, *43*(4), 300-320.

Wieland, A., & Wallenburg, C. M. (2013). The influence of relational competencies on supply chain resilience: a relational view. *International Journal of Physical Distribution & Logistics Management*.

Williamson, O.E. (1975), Markets and Hierarchies: Analysis and Antitrust Implications, The Free Press, New York, NY.

Wisner, J. D. (2003). A structural equation model of supply chain management strategies and firm performance. *Journal of Business logistics*, *24*(1), 1-26.

Wisner, J. D., Tan, K. C., & Leong, G. K. (2014). *Principles of supply chain management: A balanced approach*. Cengage Learning.

Wong, C., Skipworth, H., Godsell, J. & Achimugu, N. (2012). Towards a theory of supply chain alignment enablers: a systematic literature review, *Supply Chain Management: an International Journal*, 17 (4) 419-437.

Wong, C., Skipworth, H., Godsell, J., & Achimugu, N. (2012). Towards a theory of supply chain alignment enablers: a systematic literature review. *Supply Chain Management: An International Journal*, *17*(4), 419-437.

Wu, I.L., Chuang, C.H., & Hsu, C.H. (2014), Information sharing and collaborative behaviors in enabling supply chain performance: a social exchange perspective", *International Journal Production Economics*, 148, 122-132

Wu, K.J., Tseng, M.L., Chiu, A.S. and Lim, M.K. (2017). Achieving competitive advantage through supply chain agility under uncertainty: a novel multi-criteria decision-making structure. *International Journal of Production Economics, 190,* 96-107

Wu, M. Y., Weng, Y. C., & Huang, I. C. (2012). A study of supply chain partnerships based on the commitment-trust theory. *Asia Pacific Journal of Marketing and Logistics*, *24*(4), 690-707.

Wu, S.P.-J., Straub, D.W. & Liang, T.-P. (2015), "How information technology governance mechanisms and strategic alignment influence organizational performance: insights from a matched survey of business and it managers", *MIS Quarterly*, 39(2) 497-518.

Xiao, Y., Zheng, X., Pan, W., & Xie, X. (2010). Trust, relationship commitment and cooperative performance: supply chain management. *Chinese management studies*, *4*(3), 231-243.

Xu, D., Huo, B., & Sun, L. (2014). Relationships between intra-organizational resources, supply chain integration and business performance: an extended resource-based view. *Industrial Management & Data Systems*, *114*(8), 1186-1206.

Xue Yang, (2019) How perceived social distance and trust influence reciprocity expectations and eWOM sharing intention in social commerce. *Industrial Management & Data Systems,(119)(*4) 867-880

Yan K. F., (2011), Supply chain sustainability: a relationship management approach, *International Journal of Managing Projects in Business*, *4*(3) 480 – 497

Yandra Rahadian Perdana, Wakhid Slamet Ciptono, Kusdhianto Setiawan, (2019) "Broad span of supply chain integration: theory development", *International Journal of Retail & Distribution Management, 47*(2), 186-201

Yao “Henry” Jin Amydee M. Fawcett Stanley E. Fawcett, (2013),"Awareness is not enough", *International Journal of Physical Distribution & Logistics Management*, *43*(3) 205 – 230

Ye, F. & Wang, Z. (2013), Effects of information technology alignment and information sharing on supply chain operational performance, *Computers & Industrial Engineering*, *65*(3) 370-377

Yi L., (2015), Effects of suppliers’ trust and commitment on customer involvement, Industrial Management & Data Systems, *115*(6), 1041 – 1066

Ying X. L., (2012),Greening community pharmaceutical supply chain in UK: a cross boundary approach, *Supply Chain Management: An International Journal*, *17*(1), 40 – 53

Ying-Pin Y. , (2016), Critical influence of relational governance on relationship value in strategic supply management, *European Business Review*, *28*(2) 137 – 154

Younghoon Chang, Siew Fan Wong, Uchenna Eze, Hwansoo Lee, (2019) "The effect of IT ambidexterity and cloud computing absorptive capacity on competitive advantage", *Industrial Management & Data Systems*, *119*(3) 613-638,

Yung-Heng Lee, Min-Ren Yan, (2019) "Factors influencing agents’ bargaining power and collaborative innovation", Asia Pacific *Journal of Marketing and Logistic*, *31*(2) 559-574,

Zhang, C., Xue, L., & Dhaliwal, J. (2016). Alignments between the depth and breadth of inter-organizational systems deployment and their impact on firm performance. *Information & Management*, *53*(1), 79-90.

Zhao, X., Huo, B., Selen, W., & Yeung, J. H. Y. (2011). The impact of internal integration and relationship commitment on external integration. *Journal of operations management*, *29*(1-2), 17-32.

Zhihong W., (2013),Investigating the relationship of sustainable supply chain management with corporate financial performance, *International Journal of Productivity and Performance Management*, *62*(8), 871 – 888

Zhizhong J. (2011),The importance of trust vis-à-vis reliance in business relationships: some international findings, *International Marketing Review*, *28*(4) 318 -339

Zimmermann, R., Ferreira, L.M & Carrizo Moreira, A. (2016), The influence of supply chain on the innovation process: a systematic literature review. Supply Chain Management: *An International Journal*, 21(3) 289-304.

Zoski, K. W., & Jurs, S. (1990). Priority determination in surveys: an application of the scree test. Evaluation Review, 14, 214-219.

Zsidisin, G.A. & Ellram, L.M. (2003), An agency theory investigation of supply risk management, *The Journal of Supply Chain Management*, 39 (3) 15-27.

Zsidisin, G.A. & Smith, M.E. (2005), Managing supply risk with early supplier involvement: a case study and research propositions*", Journal of Supply Chain Management*, 41 (4) 44- 57.

APPENDICES

Appendix I: Introduction Letter

Dear Respondent,

I'm a PhD student at Jomo Kenyatta University of Agriculture and Technology (JKUAT) College of Human Resource Development. In partial fulfillment of the course requirements, I am conducting a study on: **Influence of Supply Chain Relationship Management Practices on Performance of Pharmaceutical Firms in Kenya.**

Kindly fill in the blanks in the attached list of questions to the best of your knowledge. The information in this questionnaire will be strictly confidential and is only meant for academic purposes. The information will not be used for any other purpose other than for this research.

Your assistance in facilitating the same will be highly appreciated.

Thank you in advance.

Akwalu Ezekiel Kiriinya

Appendix II: Questionnaire

This questionnaire is to collect data for purely academic purposes. The study seeks to determine the influence of supply chain relationship management on performance of pharmaceutical firms in Kenya. All the information will be treated with confidence.

Answer all questions as indicated by either filling in the blank or ticking an option that applies

Section A: Demographic Information

1. Kindly indicate your gender

   Male **[ ]**

   Female **[ ]**

2. How many years has the company been in operation?

Less than 10 years **[ ]**

10-20 years **[ ]**

More than 20 years **[ ]**

3. How long have you worked in the company?

Less than 5 Years **[ ]**

5-10 years **[ ]**

Over 10 years **[ ]**

Section B : Transparency

Kindly rate the extent to which you agree with the following statements concerning Transparency in your organization.

Statement		**Strongly disagree (1)**	**Disagree (2)**	**Uncertain (3)**	**Agree (4)**	**Strongly Agree (5)**
1	we extend credit facilities					

	to our customers					
2	We share market information with our customers					
3	we regularly conduct customer audits					
4	we involve customers in risks management					
5	Our firm easily resolve customer conflict					
6	we coordinate with our customers based on products supply					
7	Our firm response to suppliers is timely					
8	Our firm has gained loyalty from all customers					

Section C: Resilience Building

Kindly rate the extent to which you agree with the following statements concerning resilience building in your organization.

Statement		**Strongly disagree (1)**	**Disagree (2)**	**Uncertain (3)**	**Agree (4)**	**Strongly Agree (5)**
1	we adapt quickly to new customer requirements					
2	Our firm is always prepared to deal with supply disruptions					
3	Our firm has invested in building visibility					
4	Our firm has stable and assured supply					
5	Our firm is flexible to customer requirements					
6	Our firm is alert to new customer demands					
7	We respond to unanticipated customer needs in time					

8	Our firm is innovative to new preferences					

Section D: Collaborative Planning

Kindly rate the extent to which you agree with the following statements concerning collaborative planning in your organization

Statement		**Strongly disagree (1)**	**Disagree (2)**	**Uncertain (3)**	**Agree (4)**	**Strongly Agree (5)**
1	Our firm collaborate with customers in new product development					
2	We involve customers in forecasting					
3	We have joint execution schedules					
4	We have collaboratively installed a common IT system					
5	Our firm involve customers in stock replenishments					
6	We have joint project teams with customers					
7	We involve customers in planning marketing activities					
8	Our firm share financial resources					

Section E: Process Alignment

Kindly rate the extent to which you agree with the following statements concerning process alignment in your organization:

Statement		**Strongly disagree (1)**	**Disagree (2)**	**Uncertain (3)**	**Agree (4)**	**Strongly Agree (5)**
1	Our strategic objectives are compatible with customers					
2	Our relational behavior is compatible to customers					
3	Our management styles are compatible					
4	Our delivery standards are acceptable					
5	Our firm marketing activities are satisfactory					
6	We provide satisfactory product characteristics					
7	Data exchange with customers is acceptable					
8	Our IT systems are compatible					

Section F: Inter-Organization Systems

Kindly rate the extent to which you agree with the following statements concerning Inter-Organization Systems in your organization

Statement		**Strongly disagree (1)**	**Disagree (2)**	**Uncertain (3)**	**Agree (4)**	**Strongly Agree (5)**
1	Our firm has customer integrated information systems					
2	We receive and process orders electronically					
3	We manage inventory electronically					
4	We receive Customer feedback electronically					
5	Our firm electronically share market information					
6	Our customers pay electronically					
7	Our firm electronically coordinate deliveries					
8	Our firm electronically undertake corrective actions					

Section G: Organizational Performance

Kindly rate the average percentage target achievement of your firm for the last five years (2012-2017)

Statement		**1-20**	**21-40**	**41-60**	**61-80**	**81-100**
1	We achieve Annual targets					
2	Our Customer satisfaction is good					
3	our market share has been increasing					
4	Our deliveries are timely					
5	Our operational costs are low					
6	Our forecasting is Accurate					
7	We have Product quality					

	improvements programs					
8	Our revenues have been Increasing					

Appendix III: List of Pharmaceutical Firms in Kenya (KAPI 2017)

Manufacturing firms in Kenya

1) Beta Healthcare (Shelys Pharmaceuticals)
2) Biodeal Laboratories Ltd.
3) Cosmos Limited
4) Dawa Ltd.
5) Dawa Pharmaceuticals Limited – Nairobi
6) Diversey Lever – Nairobi
7) Elys Chemical Industries Ltd – Nairobi
8) Elys chemicals Industries Ltd
9) Glaxo SmithKline – Nairobi
10) Infusion (k) Ltd [IKL]
11) Infusion medicare
12) Ivee Aqua EPZ Limited – Athi River
13) laboratories & allied
14) Medisel (K) Ltd, Thika
15) Novelty Manufacturers Ltd – Nairobi
16) Novelty Manufacturing, Nairobi
17) OSS-Chemie (K) Ltd, Nairobi
18) Pharmaceutical Manufacturing Co (K) Ltd – Nairobi
19) Pharmaceutical Products Limited – Nairob
20) Regal Pharmaceuticals
21) Sphinx Pharmaceuticals ltd
22) Universal Corporation Ltd

Importing pharmaceutical firms in Kenya

1) Accord Healthcare (Kenya) Ltd
2) Ace Pharmaceuticals Ltd
3) Adcock Ingram East Africa Ltd
4) Alpha Medical Manufacturers Ltd
5) Ansell Pharmaceuticals Ltd
6) Armicon Pharmaceuticals Ltd
7) Astrazeneca
8) Aventis Pasteur SA East Africa – Nairobi
9) Bayer East Africa Limited – Nairobi
10) Beijing Holley-Cotec Co., Ltd.
11) Benmed Pharmaceuticals Ltd, Nairobi
12) Beta Healthcare International Ltd
13) Betroy Pharmaceuticals
14) Biodeal Lboratories Ltd
15) Biopharma Ltd
16) Biotech Pharma Ltd
17) Boehringer Ingelheim Division

18) British Pharmaceuticals Ltd
19) Biologic Solutions Ltd
20) Bioline Agency
21) Biofit Diagnostics
22) Bakpharm Ltd
23) BOC Kenya Ltd
24) C. Mehta 8. Co. Ltd
25) Cadila Pharmaceuticals (EA) Ltd
26) Caroga Pharma Kenya Ltd
27) CAsterisk Ltd
28) Central Drug Company Ltd
29) Chemolife Ltd.
30) Cistein Pharmaceuticals
31) Cloriti Pharmaceuticals (E.A) Ltd
32) Comet Healthcare Ltd
33) Concepts (Africa) Ltd
34) Crown Solutions Ltd -Crown Healthcare Division
35) Cistein Pharmaceuticals
36) Egypro East Africa Ltd
37) Eldohosp Pharmaceuticals Ltd
38) Elegant Remedies Ltd, Nairobi
39) Eli Lilly (Suisse) S A, Nairobi
40) Elys Chemical Industries Ltd
41) Eros Ventures Ltd
42) Europa Healthcare Ltd, Nairobi
43) Eurox Pharmaceuticals Ltd, Nairobi
44) FAW Pharmaceuticals Ltd
45) Galaxy Pharmaceuticals Ltd
46) Gesto Pharmaceuticals, Nairobi
47) GlaxoSmithKline
48) Glaxy Pharmaceuticals Ltd, Nairobi
49) Glenmark Pharmaceuticals Ltd, Nairobi
50) Globe Pharmacy Ltd
51) Globe Pharmacy Ltd, Nairobi
52) Goodman Agencies Ltd, Nairobi
53) Hain Lifescience E.A Ltd
54) Haripharma Pharmaceuticals
55) Harley's Ltd
56) High Chem Pharmaceuticals Ltd, Nairobi
57) Hoffman-La Roche Ltd, Nairobi
58) Dafra Pharma Ltd
59) Dannes Pharmacy Ltd
60) Dawa Limited
61) Didy Pharmaceutical – Nairobi
62) Doctor Pharma (K) Ltd, Nairobi
63) Dannes Pharmacy Ltd
64) DafrDepo Pharma Ltd
65) Pharma Ltd

66) Goodman Agencies Ltd.
67) Globe Pharmacy Ltd
68) Global Net-Medical Ltd
69) Ray Pharmaceuticals Ltd
70) Pharmaco Healthcare
71) Rup Pharm Ltd.
72) Riviera Pharmaceuticals Ltd
73) Pharm Access Africa Ltd.
74) Sai Pharmaceuticals, Nairobi
75) Sal Healthcare Ltd, Nairobi
76) Sanofi Pasteur International
77) Schering - Plough Corporation U S A, Nairobi
78) Seropharm E.A Ltd
79) Shamco Industries Limited
80) Simba Pharmaceuticals Ltd
81) Sky Pharmacy Ltd
82) Solvex Agencies
83) Statim Pharmaceuticals Ltd, Nairobi
84) Suken International LTD
85) Sunnyland Pharmaceuticals Ltd
86) Sunpar Pharmaceuticals Ltd, Nairobi
87) Surgilinks Ltd, Nairobi
88) Surgimed Healthcare Supplies Ltd
89) Surgipharm Ltd, Nairobi
90) Syner Chemie Ltd
91) Syner-Med Pharmaceuticals (K) Ltd
92) Saicare Enterprises Ltd
93) Technomed Ltd
94) Teknobyte Ltd
95) Three Pyramids Compant Ltd, Nairobi
96) Total Hospital Solutions Ltd
97) Transchem Pharmaceuticals Ltd.
98) Transwide Pharmaceuticals Limited
99) Trinity Pharma Limited
100) Twokay Chemicals Ltd
101) Surgimed Healthcare Supplies
102) IPCA Laboratories Ltd
103) Jos. Hansen and Soehne (EA) Ltd, Nairobi
104) Ken-Bangla Pharmaceuticals Ltd.
105) Kentons Ltd
106) Kulal International Ltd, Nairobi
107) Labo Pharma Kenya
108) Laborex Kenya Eurapharma Ltd
109) lnterlake Pharmaceuticals Co. Ltd
110) Lords Healthcare Ltd, Nairobi
111) Lukim Pharmaceuticals Agencies Ltd
112) Mac Lawrence Pharmaceuticals Co. Ltd
113) Macnaughton Ltd, Nairobi

114) Mac's Pharmaceuticals Ltd, Nairobi
115) Madawa Pharmaceuticals Ltd, Nairobi
116) Manhar Brothers (Kenya) Ltd – Nairobi
117) Masten Pharmaceuticals Ltd
118) Maxim Pharmaceuticals Ltd
119) Medisel Nairobi Limited,
120) Medivet Products Ltd.
121) Medkam Pharmaceuticals E.A Ltd
122) Medox Pharmaceuticals (K) Ltd, Nairobi
123) Metro Pharmaceuticals Ltd, Nairobi
124) Micro Labs Ltd
125) Nationwide Pharmaceutical Ltd, Nairobi
126) Neema Pharmaceuticals Ltd
127) Nila Pharmaceuticals Ltd.
128) Nilson Pharmaceuticals Ltd, Nairobi
129) Njimia Pharmaceuticals Ltd
130) Norbrook Kenya Ltd
131) Novartis Rhone Poulenic Ltd – Nairobi
132) Novelty Manufacturing Ltd
133) Omaera Pharmaceuticals Ltd, Nairobi
134) Pan Pharmaceuticals Ltd, Nairobi
135) Pfizer Laboratories Ltd, Industrial area. Nairobi
136) Pharm Access Africa Ltd, Nairobi
137) Pharmaco Healthcare
138) Pharmaken Ltd
139) Phillips Pharmaceuticals Limited – Nairobi
140) Ray Pharmaceuticals Ltd, Nairobi
141) Regency Pharmaceutical Ltd, Nairobi
142) Revital Healthcare (EPZ) Ltd, Nairobi
143) Riviera Pharmaceuticals Ltd
144) Uni Supplies & Marketing (K) Ltd
145) Unisel Pharma (K) Ltd
146) United Pharma (K) Ltd
147) Wellmed Pharmaceutical Ltd
148) Wessex Pharmaceuticals Ltd, Nairobi
149) Wockaine International Ltd, Nairobi

Source: (KAPI, 2017)