

**SUPPLY CHAIN INTEGRATION AND OPERATIONAL PERFORMANCE
OF MANUFACTURING FIRMS IN MOGADISHU, SOMALIA**

BY

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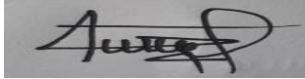
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DECLARATION

Student Declaration

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

Date: 8th Dec, 2020



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Supervisors' Declaration

This research project has been submitted for examination with our approval as University appointed supervisors.



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DEDICATION

To my beloved parents, my father Ali Dibad Jehow, my mother Fadumo Mohamed Abdi and my uncle Yusuf Dibad Jehow for their prayers, understanding, encouragement, patience and endless support both emotionally and financially during my academic journey. To my future wife and children, it is because of them that I had to work hard and achieve this so that I can give them a better life.

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ABBREVIATIONS AND ACRONYMS

BSC	Balance Scorecard
NT	Network Theory
RDT	Resource Dependence Theory
SCI	Supply Chain Integration
SCM	Supply Chain Management
SEM	Structural Equation Modeling
SPSS	Statistical Package for Social Sciences

ABSTRACT

This investigation focused on supply chain integration and how it is linked with operational performance of the manufacturing entities in Mogadishu, Somalia. The specific focus of the inquiry was on extent of supply chain integration and how this is linked with operational performance. The investigation leveraged on descriptive survey design targeting 52 manufacturing entities with use of census where data was gathered from first hand sources. Processing of the gathered views of the participants was done as supported by descriptive and inferential statistics. It was noted that supplier integration had the largest contribution towards operational performance followed by customer integration and then internal integration. The study concluded that supply chain integration significantly contributes towards operational performance of the firm. The study recommended that the policy makers of the manufacturing firms in Mogadishu should give more weight on supplier integration followed by customer integration and then internal integration. The procurement and supply chain managers of the manufacturing firms in Mogadishu should focus more on suppliers and customers since this would significantly enhance operational performance. The study was limited by some challenges that impaired the spread of Covid-19 pandemic so that it was difficult to meet all the required respondents since most of them were affected by Corona and they were working from their homes. The study recommends further studies to focus on Supply chain integration in other industries and thus meaningful generalization of the findings.

Key words: Supply chain integration, Operational performance, Manufacturing firms

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Organizations can capitalize on supply chain integration (SCI) to maximize on their operational performance (Fabbe-Costes & Jahre, 2007). The end aim of supply chain management is gaining long term competitive advantage over other competitors in the market (Tan, 2001). The SCI is perceived to enhance performance and being effective in terms of meeting customer demands (Ralston et al., 2015). SCI is viewed as a paradigm shift from the traditional supply chains which were fragmented to integrated supply chains which work in harmony (Rage, 2019).

The study was guided by the stakeholder theory, network theory and resource dependence theory. In light of the stakeholder theory, the operational performance of a firm is dependent on its stakeholders (Freeman, 1984) who include both the suppliers and the customers that are key components of the supply chain (Sarkis *et al.*, 2011). The network theory (NT) also known as network perspective commonly relates with the value creation through inter-firm relationships (Leonhard, 1736). The resource dependence theory (RDT) focuses on how firms are dependent on resources which are controlled by other firms, for example inputs such as materials and goods and how they manage their internal and external relationships (Ketchen & Hult, 2007). Supply chain partners depend on each other for resources (Pfeffer & Salancik, 1978, Godfrey, 1998 hence the relevance of the theory.

Manufacturing involves conversion of raw materials as inputs to finished products as output (Mohamed et al., 2019). It is believed that about 50 percent of manufacturing startups collapse within their first five years of operation with majority failing to celebrate their first anniversaries since their inception (Farah, 2018). This is due to the challenges from political instability that make

it hard to setup production plans, unstable regulatory environment, and the persistent attacks from the insurgent groups. Most of the manufacturing firms in Mogadishu are facing an emerging challenge generated by the level of competition in the market since they are most still in their early stage (Gele, 2019). Implementation of supply chain integration provides competitive advantage to the firms as they would be able to effectively meet customers demand, thus this study therefore attempted to explore how SCI may help increasing operational performance of manufacturing firms in Mogadishu Somalia.

1.1.1 Supply Chain Integration

Supply chain integration (SCI) is coordination and linkage both internally across departments and externally across supply chain parties to ensure efficient and effective flow of resources (Ralston et al., 2015). SCI is coordination and alignment of supply chain activities and processes aimed at achieving a common goal. For integration to be successful, it should be envisioned around the same goal this is attainable through all supply chain partners involvement in generation and implementation of long-term goals hence the partners and the firm are both working towards attaining shared objectives (Rage, 2019). Supply chain integration consists of sharing of resources hence maximizing on the resources controlled by the supply chain parties. The resources shared are among information, finances and material this assists the firms to effectively meet their customers' needs (Singh & Sohani, 2011). Through meeting the expectations and needs of customers the firms provide customer value proposition.

SCI can be viewed from these three dimensions; internal integration, supplier integration and customer integration (Qi et al., 2017). Internal integration is the process of inter functional interaction, cooperation and working together which creates a cohesive organization (Flynn et al.,

2010). Customer integration involves firms working together with its customers who are the market base (Zhao et al., 2011). Supplier integration entails engaging the supplier in an organization activity to ensure coordination of the organization activities and the supplier operations (Flynn et al., 2016). This study used the three dimensions of SCI covering internal integration, supplier integration and customer integration.

1.1.2 Operational Performance

Hudson et al. (2000) describe operational performance as the accomplishment of activity measured against already set specifications or standards. The indicators of operational performance include; product to market time, lead time, inventory levels, responsiveness, quality of information shared, customer loyalty, effectiveness, flexibility and on time delivery (Stanley et al., 2008). Product to market time is the period between when the product idea is generated through development of specifications to the time when the product is available to the market for purchase. Excellence in operational performance provides that the product to market time is short. Lead time is regarded as the duration between when one places an order and when the order is received (Rajaniemi, 2012). For the attainment of effective operational performance, the lead time needs to be short. Products are required to be of high quality; that is, they conform to standards and are fit for use (Yaghoobi & Haddadi, 2016).

Firms ought to hold the required levels of stock as well as have enough buffer stock and avoid tying up capital in form of stock by holding large amounts of inventory which are surplus to requirement (Kim, 2006). The supply chain needs to be responsive and flexible as it can quickly adjust to changes in demand that it is able to meet high demand as well as reduce production during low demand (Fowowe, 2017). Customer loyalty provides that the customer makes repeat purchases

on the firm's product; hence there is reduced or no churn rate (Keiningham et al., 2006). Effectiveness is measured depending on how the organization is able to meet its objectives and fulfill customer expectations (Kaplan & Norton, 1992). In this study, operational performance was operationalized into quality, delivery and flexibility.

1.1.3 Manufacturing Firms in Mogadishu, Somalia

Manufacturing firms are in in the manufacturing industry which involves processing of raw materials to products. In Somali, about 50 percent of manufacturing startups collapse within their first five years of operation with majority failing to celebrate their first anniversaries since their inception (Farah, 2018). According to Ministry of Commerce and Industry of Somalia (2020), there are 52 manufacturing firms in Mogadishu. In 1991, there were 53 small, medium and large companies in Mogadishu when civil war broke out. The civil war rendered all these firms nonfunctional (Gele, 2019).

However, currently the manufacturing sector is recovering with citizens in diaspora reinvesting in Somalia through setting up manufacturing firms. Manufacturing firms in Mogadishu are both local and also global brands such as Coca Cola which have established their subsidiaries in Mogadishu. Manufacturing firms produce plastic elements, soft drinks and beverages, aluminum, interlocks, painting colors, tissue papers, some cosmetics, fish, mineral water, detergent and soap (Ministry of Commerce and Industry of Somalia, 2020). The manufacturing sector contributes to the growth of Somali economy through contributing to the Gross Domestic Product (GDP), contributes to the income of the country from export of manufactured products as well as providing employment opportunities (Ministry of Commerce and Industry of Somalia, 2020). According to United Nations Development Program (UNDP), Somalia is among the prospects of growing economies

hence it has potential for expansion of manufacturing sector, new entrants can join as well as the existing firms have room for expansion.

1.2 Research Problem

SCI is regarded as a tool which organizations can leverage on to gain competitive advantage through ensuring excellence in their operational performance (Mideva & Moronge, 2019). Supply chain ensures improved operational performance through improved customer satisfaction, improved order fulfillment, shortening the production time and increasing the speed to market (Atnafu & Hussen, 2017). Alfalla-Luque et al., (2013) was of the view that placing emphasis on external and internal forms of integration especially with end users and the suppliers provides a good dimension of analysis for research work.

The past civil wars witnessed in Somalia in the past two decades adversely affected the key sectors like manufacturing firms. Presently, majority of the manufacturing firms are striving to recover from the past economic shocks that were occasioned by the already stated civil wars (Gele, 2019). However, quick recovery and resilience of these manufacturing firms would depend on how they are able to integrate with suppliers and customers. SCI would enable these firms to effectively meet the changes in demand (Rage, 2019) while being responsive to the needs of their customers and thus better operational performance.

Atnafu and Hussen (2017) did an inquiry into SCI and its link with operational performance of the enterprise in the Ethiopian context, revealing a direct interaction. Mideva and Moronge (2019) sought to bring out the link between supply chains that are integrated with ability of the entity to perform among Kenyan manufacturing firms and showed that increased purchasing practices, distribution practices lead to increase in performance. In Ghana, Otchere et al., (2013) looked at

SCI and competitive positioning of the entity , arguing that they are significantly linked with each other. Sharon Gitonga (2017) covered the first moving consumer entities in Nairobi pointing out the LMPs that have been in place to include transportation and warehousing this ensure timely delivery of products to clients hence avoiding inventory bottlenecks.

Locally in Somalia, Rage (2019) studied supply chain integration and responsiveness of supermarkets in Mogadishu Somalia and recommended that supermarkets in Mogadishu should embrace supply chain integration as it leads to responsiveness to customer demands. Farah (2018) did an inquiry into supply chain management and ability of entities to perform, arguing that the Somalia manufacturing entities should embrace technology to enhance on their flexibility and thus enhancing on their performance.

The aforementioned studies create conceptual gaps since some of them were conducted relating SCI with other variables like competitive advantage (Otchere et al., 2013), organizational performance (Farah, 2018) and not operational performance. The other studies create contextual gaps given that they were conducted in other countries away from Somalia. Thus, in order to address these gaps, the present study sought for answers to the following research question: what is the effect of supply chain integration on operational performance of manufacturing firms in Mogadishu, Somalia?

1.3 Research Objectives

To establish the effect of supply chain integration on operational performance of manufacturing firms in Mogadishu, Somalia.

The study was guided by the following specific objectives:

- i. To establish the extent of supply chain integration among manufacturing firms in Mogadishu, Somalia
- ii. To determine the relationship between supply chain integration and operational performance of manufacturing firms in Mogadishu, Somalia

1.4 Value of the Study

The study recommendations on improving supply chain integration and findings on challenges that firms face when implementing SCI would provide the best plot for top management to formulate strategies on adoption of SCI hence improving operational performance. The recommendations would be useful to policy makers in their attempt to develop binding and practical policies and regulations which are key in guiding the operation of the manufacturing sector. The findings and recommendations can also be applied by other organizations in different sectors such as health, construction and banking.

Supply chain integration being a contemporary issue; the study would also be useful to learners and scholars of this topic as they can use it not only as a guide but as reference material allowing learners in the procurement and supply chain management field to be taught using the right curriculum that integrates their learning with practical experience in the field.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter is set out to review the theories that provide anchorage to the study. Literature on SCI and operational performance is also reviewed. The empirical studies are also examined with the gaps from the studies as well as the gaps.

2.2 Theoretical Review

The stakeholder theory, network theory and resource dependence theory was used to guide the study with their discussion indicated in subsequent sections.

2.2.1 Stakeholder Theory

The theory was developed by Freeman (1984) where stakeholders are viewed as any grouping either inside or outside an organization which is said to have a stake in the firm while inserting an influence on strategic decisions made by the firm. In the organization, the supply chain system is made up of several stakeholders including the suppliers and customers who can be affected by or can also be affected by the decisions made by the firm (Freeman, 1984). Since the stakeholder theory relates with how a firm interacts with its stakeholders who include the partners within the supply chain (Phillips, 2003), the foundation of this relationship is supply chain integration prospects of the firm (Sarkis et al., 2011).

Although widely acknowledged in the field of strategic management, this theory has faced criticisms from a number of scholars. For instance, Key (1999) opined that the stakeholder theory does not have specificity hence limiting the need to scientifically operationalize it. Teppo (2003) on the other hand argues that the stakeholder theory share unrealistic opinions on how the entity

carry out its operations. At the same time, Blattberg (2013) heavily criticizes its assumption that a firm, is able to compromise or balance the interests of different stakeholders which is not realistic. Despite its criticisms, this theory is relevant to the study since it concerns the stakeholders in the firm including the suppliers and customers who are key parties during supply chain integration efforts of the firm.

2.2.2 Network Theory

Leonhard (1736) advanced this theory and its essence to provide a description of the relationships the firm develops with its supply chain partners including the customers and suppliers. From its original focus of the relationship between two parties (strategic alliances) during inception in 1970s, the network had undergone development to cover multiple relationships among various parties in the supply chain. The term network as viewed by Harland (1996) is a given form of relation that links predetermined sets of individuals or events. On the other hand, Thorelli (1986) consider network as two or more firms that have entered into relationship to cover a long term horizon.

The theory is premised on a number of factors including the fact that the centrality of the firm in the network shapes its competitive positioning and that there is inter-firm sharing of knowledge and information (Håkansson & Ford, 2002). The limitations of this theory include the fact that collaborating with other firms may involve sharing of strategic information that may have an adverse effect on competitive advantage. Despite its limitation, this theory focuses on the relationship that the firm develops with its partners in the supply chain which is the foundation of supply chain integration.

2.2.3 Resource Dependence Theory

The resource dependence theory (RTD) was formulated by Pfeffer and Salancik (1978) and it provides that the environment constrains and affects the firm which in turn acts manages resource dependencies through development of inter-firm arrangements. Therefore, the implication of theory is that there is some form of interdependence between the firm and others within the environment for resources (Pfeffer & Salancik, 1978). These resources in the environment also include unique capabilities that drive the competitive positioning of the firm. One firm cannot have all the required resources in place and thus the need to depend on other firms to bridge the resource gap. For instance, a firm depends on its suppliers for replenishment of inventories (Godfrey, 1998).

The criticism of this theory includes its ability to combine mutual dependence and imbalance of power into one unit of interdependence which affects the testing of the theory (Drees & Heugens, 2013). Despite the criticism, this theory relevantly dwells on the link between reliance on resources and the realization of performance in the entity. For instance, interdependence between the firm and its suppliers will enhance supplier integration.

2.3 Supply Chain Integration

Supplier integration is the ability of purchasing firms and suppliers to share and apply strategic, financial and operational knowledge for generation of mutual returns (Hussen, 2015). Supplier integration is established on flow and sharing of information between the entity and its suppliers, design and quality issues (Uwamahoro, (2018). The essence of supplier integration is to enhance efficiency and smoothness in how the materials flow within the network of suppliers (Pakurár, Haddad, Nagy, Popp & Oláh, 2019). By sharing information, there is reduction in conflicts while clear communication of the expectations of the suppliers and the buying organizations. A firm can

develop relationship with its suppliers to cover either a shorter period of a longer period and such relationship can be beneficial as it can lower the transaction costs through reputation and trust that will have been established (Hamid, Raslic & Heng, 2014). The three key elements that are exchanged between parties in the during supplier integration arrangement include materials knowledge and information (Anjum, Kashif & Riaz, 2016). Supplier integration can help the buying organization to improve on its internal operational competencies. Through supplier integration, the suppliers are able to understand the needs of the buying entity while being in position to timely adapt to the ever changing requirements (Nartey, Aboagye-Otchere & Simpson, 2020). Such a relationship can be the basis of joint product development in the firm. Success of this relationship requires frequent communication especially with regard to supply and demand issues (Som, Cobblah & Anyigba, 2019)

Customers are important partners in the supply chain system since they have the purchasing power with ability to evaluate the product and make a purchasing decision (Otchere, Annan & Anin, 2013). Organizations engage in customer integration arrangements so as to be able to meet the needs and preferences of the customers while ensuring that their expectations have been maximized. Organizations operationalize customer integration by seeking for information on customers about the products (Farah, 2018). The feedback the firm gets from the customers will give information on areas for improvement. A manufacturing organization should always ensure that the opinions of its customers have been factored in the initial design of the product to enhance demand of the final product (Mideva & Moronge, 2019). The entity responds to the needs of the customers when there is customer integration and this improves the quality of the produced products (Pakurár, Haddad, Popp, Khan & Oláh, 2019). Customer integration generates information that determines market expectations which inform the design of the products (Hussen,

2015). By involving the end users in all the process of product development, the number of reworks is minimized while a joint problem solving is promoted (Mutwiri, Marendi, Riro & Ratemo, 2018).

Seamless flow and coordination of activities within an organization require the firm to have internal integration. Internal integration can be characterized by a high degree of teamwork, sharing of information, joint formulation of plans and functional cooperation (Turkulainen, Roh, Whipple & Swink, 2017). Internal integration aims at promoting smooth flow of resources, information as well as products for customer satisfaction while saving on costs (Ataseven & Nair, 2017). It covers the integration between several departments and processes within the firm with the aim of meeting the needs of the customers (Ayoub, Abdallah & Suifan, 2017). During internal integration, there is coordination between various functions and departments in the firm so that an integrated system is established that ensure timely response to the needs of the customers. Lotfi, Sahran, Mukhtar and Zadeh (2013) viewed internal integration to involve the internal activities and processes within the firm. An entity should be able to structure its operations and processes so as to effectively fulfill orders of the customers (Errassafi, Abbar & Benabbou, 2019) while maximizing on the interaction with its suppliers. Through internal integration, Ali (2019) opines that an organization is able to respond to uncertainties in the operating environment. According to Shukor, Newaz, Rahman and Taha (2020), internal integration incorporates the structures, practices and procedures that should be synchronized for fulfillment of the orders of the customers.

2.4 Supply Chain Integration and Operational Performance

Performance is a general term that can be viewed from an accounting/finance dimension or market based perspective (Uhrin, Bruque-Cámara & Moyano-Fuentes, 2017). In operational terms, the term performance is used in reference to efficiency and effectiveness of processes in the firm

(Rungtusanatham, Salvador, Forza & Choi, 2003). Ideally, operational performance can be regarded as the degree which an entity is able to attain positive operational outputs relative to other participants in the industry. Similarly, Lyu, Chen and Huo (2019) considered operational performance as the performance of the entity that is determined on the basis of some established parameters of efficiency, effectiveness and responsibility towards the environment that cover cycle time, the level of productivity, reduction in waste and compliance with regulations.

Yuen and Van-Thai (2017) viewed operational performance as strategic indicators that a firm leverage on when competing. Marodin, Frank, Tortorella and Fetterman (2019) shared costs, customer services, flexibility and quality as the constructs of indicators performance. Chowdhury, Lau and Pittayachawan (2019) argued that the measures of operational performance include costs, flexibility, delivery and quality. On the other hand, (Truong, Sameiro *et al.* 2017) argued that these measures can as well be replicated in the field of SCM. Consequently, various empirical studies on SCM have adopted flexibility, delivery, quality and cost as the measures of operational performance (Kumar *et al.*, 2017).

In this study, operational performance will be represented by quality, delivery and flexibility. Quality can be viewed in terms of conformance (the degree which the product conforms to the specification at the phase of manufacturing), durability, reliability and performance of the product (Shou, Li, Park & Kang, 2018). It can also be considered in terms of information quality, which includes such indicators as credibility, completeness, adequacy and timeliness. Delivery is an indicator that is connected with time, and it refers to the degree which an entity is able to ensure that products have been delivered at specified time. Delivery has an effect on product cycle time and delivery lead times (Acar, Zaim, Isik & Calisir, 2017). Flexibility is the degree which an entity is able to adapt as well as respond to changes so as to meet the needs of the end users (Chan 2003).

2.5 Empirical Literature Review

Pakurár *et al.* (2019) leveraged on views shared from 290 respondents where a significant link between SCI and financial performance outcomes was noted. Hussien (2015) identified a positive link between SCI and operational performance of an entity. Hamid *et al.* (2014) placed emphasis on SCI and how it impacts on operational capability. With the adoption of structured equation modeling (SEM), it was shared that SCI positively interacts with operational capability of an entity. Anjum *et al.* (2016) noted that those entities wishing to enhance on their operational performance should realization the need for collaborating with suppliers and customers with cross functional integration in the firm. In Ghana, Som *et al.* (2019) relied on a 26.6% response rate noting that integration of the operations and information directly impacts on supply chain performance of the entity. With key emphasis on Chinese automotive industry, Lu, Ding, Asian and Paul (2018) established that the link between SCI and operational performance of an entity is non-linear.

Mbugua and Namada (2019) shared that supplier, customer and internal integration are all linked with operational performance of an entity in significant terms. With a 71% response rate; Cheruiyot (2018) revealed that SCI and operational performance are positively linked with each other. Nartey *et al.* (2020) used quality, flexibility and cost as proxies of operational performance while SCI was indicated by internal as well as external dimensions and indicated that SCI is beneficial to the firm in terms of enhancing its operational performance. El-Tamimi (2015) was keen to bring out the link between SCI and operational performance and with a 51.5% response rate; a direct and significant link was noted between SCI and operational performance of the entity.

Osei and Kagnicioglu (2018) focused on SCI and operational as well as business performance. Supported by 96.3% response rate, it was noted that internally and externally established integrations all have a direct link with operational performance of an entity. In Rwanda, Uwamahoro (2018) relied on correlation and SEM arguing that SCI is linked with firm as well as operational performance of the entity. Locally in Somalia, Rage (2019) recommended that supermarkets in Mogadishu should embrace supply chain integration as it leads to responsiveness to customer demands. Farah (2018) was of the view that the Somalia manufacturing entities should embrace technology to enhance on their flexibility and thus enhancing on their performance.

2.6 Summary of Literature and Knowledge Gaps

Table 2.1: Summary of Literature and Knowledge Gaps

Author	Study	Key Findings	Gaps	Addressing Gaps
Nartey <i>et al.</i> (2020)	SCI and its link with operational performance	SCI is beneficial to the firm in terms of enhancing its operational performance.	The study was conducted in the service sector (health care) in Ghana	The present study was done among manufacturing entities in Somalia
Pakurár <i>et al.</i> (2019)	supply chain integration, internal control and their link with financial performance	a significant link between supply chain integration and financial performance outcomes was noted	The study focused on financial performance creating conceptual gap	The present study looked at operational performance
Som <i>et al.</i> (2019)	SCI and its link with the ability of supply chain systems to perform	integration of the operations and information directly impacts on supply chain performance of the entity	The study focused on supply chain performance as the dependent variable	The present study focused on operational performance
Mbugua and Namada (2019)	the link between SCI and operational performance with emphasis on Kenya's public health system	supplier, customer and internal integration are all linked with operational performance of an entity in significant terms	The study was conducted in Kenya in the health care sector	The present study was done in Somalia among manufacturing entities
Uwamahoro (2018)	SCI and performance with emphasis on manufacturing entities	SCI is linked with firm as well as operational performance of the entity	SEM was used in analysis creating methodological gap	The present study relied on multiple regression analysis
Anjum <i>et al.</i> (2016)	the link between SCI and their operational performance with the culture of the firm as a moderator variable	entities wishing to enhance on their operational performance should realization the need for collaborating with suppliers and customers with cross functional integration in the firm	There was a moderating variable aside from the independent and the dependent ones	Two variables (independent and dependent) were covered in the present study
Chin <i>et al.</i> (2014)	SCI and how it impacts on operational capability	SCI positively interacts with operational capability of an entity	The study creates a conceptual gap since it focused on operational capability as dependent variable	The present study looked at operational performance

Source: Author (2020)

2.7 Conceptual Framework

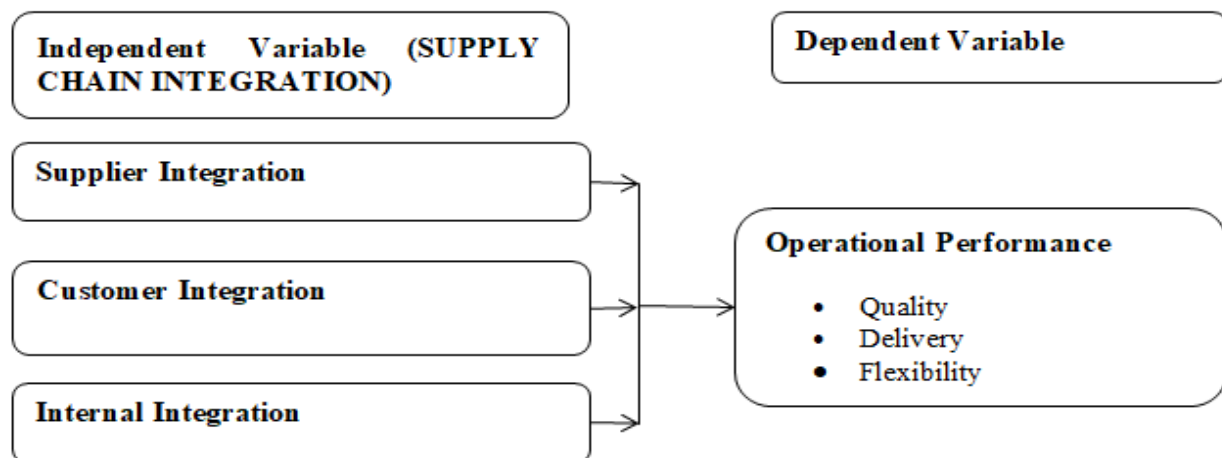


Figure 2.1: Conceptual Framework

Figure 2.1 is the conceptual framework that guided the study. It can be shown that two main variables were covered in the present study, the independent variable being SCI and operational performance being the dependent variable. SCI was represented by three proxies: suppliers, customers and internal integration.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter is set out to present the methodologies that were used to achieve the objectives of the study. The details covered in this chapter include the design, population and how the data was collected. A discussion of the analysis of the collected data is also provided.

3.2 Research Design

Descriptive survey design was adopted in this inquiry because the study covered various manufacturing firms operating in Mogadishu. Mogadishu was selected because of its centrality and accessibility given the fact that it is the capital city of Somalia. It is also among the towns in Somalia with the highest number of manufacturing firms. This design supported quantitative data and analysis especially in order to bring out the link between SCI and operational performance. Such relationship can only be well illustrated through inferential analysis like regression analysis that calls for quantitative data and thus the choice of the design.

3.3 Population

The study targeted 52 manufacturing firms with operations in Mogadishu, Somalia. Since the population is relatively small and of homogenous attributes (all of them are involved in manufacturing activities), census was adopted and thus all the 52 firms were studied. The use of census allowed for generalization of the findings to the entire manufacturing sector in Somalia.

3.4 Data Collection

The views from the participants were sought from first hand sources supported by the questionnaire. The respondents included supply chain managers, procurement managers, finance managers or logistic officers and their equivalent. These respondents were selected as they were

deemed to be knowledgeable on information relating to SCI and operational performance. Online means helped in administration of the questionnaire to the participants due to the Covid-19 pandemic.

3.5 Data Analysis

Once data has been gathered from the field, it was cleaned through excel for consistency. From excel, the completely edited data was exported to SPSS tool for analysis. The method adopted for analysis was informed by the objective as summarized in Table 3.1. Below is the model specification:

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

Where Y=Operational Performance

β_0 is the constant

β_1, \dots, β_n are beta coefficients

X_1 is Supplier Integration

X_2 is Customer integration

X_3 is Internal Integration

Table 3.1: Summary of Methodologies

Objective/Variable	Measurement	Scale	Data Collection	Data Analysis
Independent supply chain integration	<ul style="list-style-type: none"> • Supplier Integration • Customer Integration • Internal Integration 	<ul style="list-style-type: none"> • Ordinal • Nominal 	Questionnaire	<ul style="list-style-type: none"> • Frequencies & Percentages • Means • Standard Deviations
Dependent operational performance	<ul style="list-style-type: none"> • Quality • Delivery • Flexibility 	<ul style="list-style-type: none"> • Ordinal 	Questionnaire	<ul style="list-style-type: none"> • Means • Standard Deviations
Relationship between supply chain integration and operational performance			-	<ul style="list-style-type: none"> • Regression analysis

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

The background information of the respondents and descriptive statistic are covered in this chapter. It also gives result presentation from the analyzed data. All these areas are indicated as informed by the specific objectives.

4.2 Response Rate

From 52 questionnaires administered to the participants, 35 were filled in and shared back. This was same as a response rate of 67.3%. The assertion was in line with Babbie (2010).

4.3 General Information

The section contains information that describes the basic and general characteristics of the respondents. Specifically, it consists of years of operation of the firms, branch network and staff capacity of the firms.

4.3.1 Years of Operation

Table 4.1 illustrates the results on years of operation of the covered entities.

Table 4.1: Years of Operation

Years	Frequency	Percent
Less than 4 years	1	2.9
5-9 years	10	28.6
10-15 years	17	48.6
Over 16 years	7	20.0
Total	35	100.0

From the results, 48.6% of the firms had been in operation for 10-15 years, 28.6% had been in operation for 5-9 years, 20.0% had been in operation for over 16 years and 2.9% had been in operation for less than 4 years. Thus, a vast number of the entities had operated for a relatively longer time frame.

4.3.2 Branch Network

Table 4.2 gives an analysis of the branch network

Table 4.2: Branch Network

Number of branches	Frequency	Percent
Less than 4 branches	2	5.7
5-9 branches	2	5.7
10-15 branches	13	37.1
Over 16 branches	18	51.4
Total	35	100.0

The findings in Table 4.1 indicated that 51.4% of the firms had over 16 branches, 37.1% had 10-15 branches, 5.7% had 5-9 branches and less than 4 branches respectively. This implies that majority of the firms had more than 16 branches and therefore had achieved customer satisfaction due to capitalized supply chain integration between the branches.

4.3.3 Staff Capacity

Table 4.3 gives the results on staff capacity in the studied firms.

Table 4.3: Staff Capacity

Number of staffs	Frequency	Percent
Less than 10 staff	10	28.6
11-20 staff	5	14.3
21-30 staff	9	25.7
31-40 staff	8	22.9
Over 41 staff	3	8.6
Total	35	100.0

The findings on staff capacity indicated that 28.6% of the firms had less than 10 staffs, 25.7% had 21-30 staffs, 22.9% had 31-40 staffs, 14.3% had 11-20 staffs and 8.6% has more than 40 staffs. This means that majority of the studied firms were small in size (SMEs) and consistent with the Micro-Small and Medium Enterprise Authority definition of SME where micro firm have 1-9 staff, small have 10-49 staff and medium, have 50-99 staff.

4.4 Extent of Supply Chain Integration among Manufacturing Firms in Mogadishu

The study sought to establish the extent of supply chain integration among manufacturing firms in Mogadishu, Somalia. In this regard, the study established various statements on SCI constructs (customers, internal and suppliers) that were rated on 5-point Likert scale. These statements were used to generate means and standard deviation that latter helped in computation of the overall scores on each of the aforementioned constructs of SCI. Table 4.4 is a summary of the analyzed findings.

Table 4.4: Extent of Supply Chain Integration among Manufacturing Firms

Variables	Overall Mean	Overall Standard Deviation
Customer Integration	3.84	.889
Internal Integration	3.83	.804
Supplier Integration	3.73	.807

The results indicate that customer's integration (M=3.84, SD=0.889), this means that the studied manufacturing firms in Somalia had implemented customer integration to a large extent. The result is in line with Flynn et al. (2016) who found out that customer integration involves firms working together with its customers who are the market base and Farah (2018) who opined that organizations operationalize customer integration by seeking for information on customers about the products.

Internal integration (M=3.83, SD=.804) which shows that the manufacturing firms Somalia had implemented internal integration to a large extent. The findings concur with Lotfi, Sahran, Mukhtar and Zadeh (2013) who found out that an entity should be able to structure its operations and processes so as to effectively fulfill orders of the customers; Ali (2019) opined that an organization is able to respond to uncertainties in the operating environment and according to Shukor, *et al.* (2020), internal integration incorporates the structures, practices and procedures that should be synchronized for fulfillment of the orders of the customers.

Moreover, supplier integration (M= 3.73, SD=.807), which shows that the manufacturing firms in Somalia had implemented supplier integration to a large extent. This was in line with Flynn *et al.* (2016) who noted that Supplier integration entails engaging the supplier in an organization activity to ensure coordination of the organization activities and the supplier operations et al. 92013) who argued that interdependence between the firm for resources will determine the degree of SCI. For instance, interdependence between the firm and its suppliers will enhance supplier integration.

4.5 Relationship between Supply Chain Integration and Operational Performance of Manufacturing Firms in Mogadishu, Somalia

The link between SCI and operational performance was explored regressionally with findings as summarized in subsequent sections.

4.5.1 Model Summary

Table 4.5 presents the model summary.

Table 4.5: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766 ^a	.587	.547	1.65177

Table 4.5 gives R² AS 0.587; this implies that 58.7% change in operational performance of the manufacturing firms in Mogadishu is explained by SCI.

4.5.2 Analysis of Variance

Table 4.6 details ANOVA results

Table 4.6: Analysis of Variance

	Sum of Squares	df	Mean Square	F	Sig.
Regression	119.992	3	39.997	14.660	.000 ^b
Residual	84.579	31	2.728		
Total	204.571	34			

At 5% level of significance, ($F_{cal}=14.660$, $F_{crit}=2.88$ & $p<0.05$), this indicates that model in the inquiry was relevant for application.

4.5.3 Regression Beta Coefficients and Significance

Consider Table 4.7 for beta coefficients.

Table 4.7: Regression Beta Coefficients and Significance

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	11.860	2.320		5.112	.000
Supplier Integration	.162	.054	.451	2.987	.005
Customer Integration	.121	.049	.350	2.456	.020
Internal Integration	.035	.054	.094	.651	.520

a. Dependent Variable: Operational Performance

$$Y = 11.860 + 0.162X_1 + 0.121X_2$$

Y= Operational Performance

X_1 = Supplier Integration, X_2 = Customer Integration and X_3 =Internal Integration.

Table 4.7 indicate that supplier integration ($\beta=.162$, $t=2.987>1.96$ & $p<0.05$) had significant influence on operational performance. This finding is in line with Mbugua and Namada (2019) who shared that supplier, customer and internal integration are all linked with operational performance of an entity in significant terms. Cheruiyot (2018) revealed that SCI and operational performance are positively linked with each other. The finding also concurs with Hussen (2015) who identified a positive link between SCI and operational performance of an entity; Hamid *et al.*

(2014) placed emphasis on SCI and how it impacts on operational capability. With the adoption of structured equation modeling (SEM), it was shared that SCI positively interacts with operational capability of an entity. The result is supported by Nartey *et al.* (2020) who asserted that supplier integration can help the buying organization to improve on its internal operational competencies, through supplier integration, the suppliers are able to understand the needs of the buying entity while being in position to timely adapt to the ever changing requirements.

Table 4.7 further indicates that customer integration ($\beta=.121$, $t=2.456>1.96$ & $p<0.05$) and operational performance were significantly related with each other. The finding is in line Farah (2018) who opined that organizations operationalize customer integration by seeking for information on customers about the products. It was further established that internal integration ($\beta=.035$, $t=.651<1.96$ & $p>0.05$) had no significant influence on operational performance. The results contradict with Ataseven *et al.* (2017) who noted that internally established integration aims at promoting smooth flow of resources, information as well as products for customer satisfaction while saving on costs.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The essence of this chapter is to detail a summary of the analyzed views of the participants. The recap from the analysis with recommendations is also indicated. The limiting factors as well as the areas that call for further inquiries are also pointed out in this chapter.

5.2 Summary of the Findings

5.2.1 Extent of Supply Chain Integration among Manufacturing Firms in Mogadishu

The results were that SCI had been embraced to a greater degree by the manufacturing entities with operations in Mogadishu. The study further revealed that internal integration had been implemented to a large extent among most of the manufacturing firms Somalia. Supplier integration was also found to have been adopted to a large by majority of the manufacturing firms operating in Mogadishu, Somalia.

5.2.2 Relationship between Supply Chain Integration and Operational Performance

The three constructs of SCI (customers, suppliers and internal) were regressed against operational performance. The ANOVA findings showed that SCI and the need for the entity to performance are linked with each other in significant terms. In terms of the regression beta coefficients, the study noted that supplier integration had the largest contribution towards operational performance followed by customer integration and then internal integration. In view of the significance, the study noted that while supplier integration and customer integration were significantly linked with operational performance, internal integration had no significant link.

5.3 Conclusion

SCI had generally been adopted to a large extent among the manufacturing firms in Mogadishu, Somalia. The study concludes that customer integration had been adopted to a large extent among manufacturing firms in Mogadishu, Somalia followed by internal integration and lastly supplier integration. Network Theory provides a description of the relationships the firm develops with its supply chain partners including the customers and suppliers. The results are also consistent with the stakeholder theory that focuses on suppliers and customers as some of the stakeholders in the firm.

The study concludes that SCI impacts on operational performance of the entity. Supplier integration had the largest contribution towards operational performance followed by customer integration and then internal integration. In line with the significance, the study concludes that while supplier integration and customer integration were significant in affecting operational performance of the manufacturing firms, internal integration was not significant. In light of the resource dependence theory, the interaction between the manufacturing firms and their suppliers help in effective replenishment decisions that ultimately drives operational performance.

5.4 Recommendations of the Study

Based on the findings of the regression beta coefficients, the study recommends that the policy makers of the manufacturing firms in Mogadishu should give more weight on supplier integration followed customer and internally established integrations.

When making decisions that seek to optimize SCI, the procurement and supply chain managers of the manufacturing firms in Mogadishu should focus more on suppliers and customers since this would significantly enhance operational performance.

Supply chain managers of the manufacturing firms in Mogadishu Somalia should focus more on improving internal systems and structures (internal integration) that are in place to as to significantly contribute towards the degree which entity perform.

5.5 Limitations of the Study

It was difficult to achieve 100% return rate on the questionnaires since the study was limited by some challenges that impaired the spread of pandemic in the entire world so that the researcher couldn't get an enough time to reach my area of study and I was interrupted by Covid19 risk measures such as cessation of movement in and out of the territory. In relation to that my time scope was limited. Difficult in the collection of data was another limitation because most of the respondents was affected by corona and most of them were working from their homes to meet with corona safety measures such as social distancing and that brought major implications to my study. The study was limited to only manufacturing firms, thus limiting the generalization of the finding to other non-manufacturing firms. There are other additional variables including the moderating and the intervening variables. In terms of scope, the study was limited to Mogadishu town and its environ. Mogadishu was selected because of its centrality and accessibility given the fact that it is the capital city of Somalia. It is also among the towns in Somalia with the highest number of manufacturing firms. Owing to the mentioned limitations, the quality of the study was not affected.

5.6 Suggestions for Further Research

The emphasis of further inquiries should be on the manufacturing firms to increase the sample size and thus meaningful generalization of the findings. Future studies should be conducted covering non-manufacturing firms for instance, those operating in the service sector for generalization of the findings. Future inquiries should be done focusing on other contexts away from Somalia.

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APPENDICES

Appendix I: Manufacturing Firms in Mogadishu, Somalia

No.	Name		
		27	JED GROUP COMPANY
1	WARSHADDA BIYAHA COCOCOLA	28	MUDAN MULT FACTORY
2	WARSHADDA BIYAHA DALSAN	29	AMIIRA FACTORY
3	WARSHADDA BIYAHA JEMA	30	SOFT CARE PRODUCTION COMPANY
4	ZAMZAM FOOD INDUSTRY	31	AFRICAN SOLUTION FACTORY
5	WARSHADDA BIYAHA AL-NACIIM	32	MOONLIGHT TISSUE PAPER
6	HORYAL SOAP FACTORY	33	DALEEL FACTORY MOGADISHU
7	JAZEERA TOP TRASTING & INDUSTRY	34	SASAME OIL FACTORY
8	TAQWA LIQUID FACTORY	35	SOMALI TOMATO FACTORY
9	SOMALI FURNITURE FACTORY	36	ITOP JUICE FACTORY
10	UDUG DETERGENTS FACTORY	37	IRMAAN DAIRY LTD
11	SOMALI SPICES INDUSTRY	38	AL. SAFA DAIRY FACTORY
12	KAAFI INDUSTRY GROUP	39	SOMALI NATIONAL FISHING
13	DANAB LIMITED FACTORY	40	SOM PLASTIC INDUSTRY
14	CAFI MINERAL WATER	41	AL. ARABIA PLASTIC TRADING COMPANY
15	FURAAAT MINERAL WATER	42	SOMALI CHALK INDUSTRY
16	BARWAAQO GENERAL INDUSTRY	43	WARSHADDA BIYAHA IJAABO
17	SHIRKADDA DUCO LTD	44	WARSHADDA BIYAHA ASAL
18	WARSHADDA BIYAHA SAHAN	45	WARSHADDA BIYAHA IQRA
19	WARSHADDA BIYAHA JUBBA	46	HILAL PLASTIC
20	WARSHADDA BIYAHA XAYAAT	47	SOMALI SESIMA HULDIN AND OIL FACTORY
21	WARSHADDA BIYAHA XAYAAT	48	SOMALI SEAFOOD PRODUCT
22	SOMALI TISSUE	49	KULMIS ENTERPRISE INDUSTRY

23	ROYAL PAINTS MANUFACTURING. COM	50	SOMALI JUICE PRODUCTION COM.
24	OOG DAIRY FACTORY	51	DALDHIS ALUMINUM FACTORY
25	SOMALI INDUSTRIAL MANUFACTURES	52	SOMALI PLASTIC FACTORY
26	PANORAMA GROUP OF INDUSTRY		

Source: Ministry of Commerce and Industry, Somalia (2020)

Appendix II: Questionnaire

Dear Respondent

Ref: Data Collection

I am Mohamed Ali Dibad, a student at the University of Nairobi, Kenya. I am currently undertaking a research study on SUPPLY CHAIN INTEGRATION AND OPERATIONAL PERFORMANCE OF MANUFACTURING FIRMS IN MOGADISHU, SOMALIA. I am therefore requesting you to share any relevant information that will help me to complete the aforementioned study. Kindly note that any information you will share will only be used for academic purpose and it will be treated with utmost confidentiality. Feel free to get in touch in case of any concern. Thank you.

Regards,

Mohamed Ali Dibad

+254728542993

SECTION A: GENERAL INFORMATION

1. Kindly indicate the products that your firm manufactures

.....
.....

2. Kindly indicate the number of years which your firm has been in operation

Less than 4 years ()

5-9 years ()

10-15 years ()

Over 16 years ()

3. Kindly indicate the current number of branches in your firm

Less than 4 branches ()

5-9 branches ()

10-15 branches ()

Over 16 branches ()

4. Kindly indicate the number of staff that your firm currently has

Less than 10 staff ()

11-20 staff ()

21-30 staff ()

31-40 staff ()

Over 41 staff ()

SECTION B: OPERATIONAL PERFORMANCE

5. Below are some statements on operational performance. Kindly indicate the extent which you agree with each of these statements. Use a scale of 1-5, where 1-strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree.

Statements on Operational Performance	1	2	3	4	5
Quality products in the firm					
Conformation to quality specifications					
Quality information in the firm					
Quality standards in the firm					
Delivery lead times in your firm					
Flexibility to changes in the market					
Flexibility to customer needs					

SECTION C: EXTENT OF SUPPLY CHAIN INTEGRATION AMONG MANUFACTURING FIRMS IN MOGADISHU, SOMALIA

6. Kindly indicate the extent which you firm has implemented the following aspects of supplier integration. Use a scale of 1-5, where 1=no extent, 2= little extent, 3=moderate extent, 4=large extent and 5=very large extent.

Statements on Supplier Integration	1	2	3	4	5
Joint product development in the firm					
Development of long term relationship with suppliers					
The suppliers understand the needs of your firm					
You regularly share demand information with your suppliers					
You jointly resolve issues with suppliers of your firm					
The relationship with your suppliers is characterized by trust					
There is smooth flow of materials in the firm					

7. Kindly indicate the extent which you firm has implemented the following aspects of customer integration. Use a scale of 1-5, where 1=no extent, 2= little extent, 3=moderate extent, 4=large extent and 5=very large extent.

Statements on Customer Integration	1	2	3	4	5
We gather information from customers about our products					
The feedback the firm gets from the customers information on areas for improvement					
Opinions of customers are factored in the initial design of the product in this firm					
Customer integration generates information that determine market expectations in the firm					
There is joint problem solving with customers					
Reduction in number of reworks in the firm					
Ability to respond to the needs of the customers					

8. Kindly indicate the extent which you firm has implemented the following aspects of internal integration. Use a scale of 1-5, where 1=no extent, 2= little extent, 3=moderate extent, 4=large extent and 5=very large extent.

Statements on Internal Integration	1	2	3	4	5
There is seamless coordination of activities within different functions in your firm					
Teamwork among staff in different functions in your firm					
Smooth flow of resources in your firm					
Integrated system that support effective fulfillment of customer orders in your firm					
Ability of your firm to respond to uncertainties in the operating environment					
Synchronization of processes in your firm					
Existence of Enterprise Resource planning (ERP) in your firm					

END