



Addis Ababa University
College of Business and Economics
School of Commerce

Assessing the Supply Chain Strategies of Paint Manufacturing
Firms in Addis Ababa, Ethiopia

BY

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Thesis Submitted to the School of Commerce, Logistics and Supply Chain
Management Unit in partial fulfillment of the requirements for the degree of
Master's of Art (MA) in Logistics and Supply Chain Management

Advisor:

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Addis Ababa University

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CANDIDATE’S DECLARATION

I, the undersigned, declare that, this study “**Assessing the Supply Chain Strategies of Paint Manufacturing Firms in Addis Ababa, Ethiopia**” is my original work and has not been presented for a degree in any other university, and that all sources of materials used for the study have been duly acknowledged.

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Date

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

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Acronyms

A.A - Addis Ababa

AACCSA- Addis Ababa Chamber of Commerce and Sectoral Association

CSCMP-Council of Supply Chain Management Professionals

CTO - Configure-to-Order

IT- Information Technology

JIT- Just in time

MTO - Make-to-Order

MTS- Make-to-Stock

PLC-Product Life Cycle

SC – Supply Chain

SCM – Supply Chain Management

SCMMS- Supply Chain Management and Marketing Sciences

SCRM- Supply Chain Relationship Management

SCS - Supply Chain Strategy

Abstract

Organizations can use supply chain strategies to gain a competitive advantage. A competitive advantage can be achieved by means of low cost or by means of differentiation. However, organizations have to implement the correct supply chain strategy properly aligned with their business strategy to achieve competitive advantage over their competitors. Returns on investment can be compromised if organizations implement incorrect supply chain strategy. The main purpose of this study was to assess the supply chain strategies implemented by paint manufacturing firms located in Addis Ababa. The differences between supply chain strategies implied by literatures and those implemented by different firms should be analyzed by determining how the organizations are managing their supply chain drivers. A quantitative – descriptive research strategy was applied to conduct this study. Purposive or judgmental non-probability sampling employed to include all the logistics/supply chain/procurement, operation/production, finance, and marketing managers of all paint manufacturing firms located in the city of Addis Ababa in this study. Close ended questionnaire in a 5 point likert scales were employed to collect data from the 32 sample respondents. The data was analyzed by using descriptive statistics and presented in tables and figures. The major findings indicates that, paint manufacturing firms located in Addis Ababa face mismatches between the chosen supply chain strategies and supply chain practices employed which indicates misalignment of supply chain strategy with their business strategy.

Key Words: supply chain, supply chain management, supply chain strategy, lean supply chain strategy, agile supply chain strategy, leagile supply chain strategy, paint manufacturing firms

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Because of globalization, steep competition, change in market demand and the rapid adoption of outsourcing, today's organizations are operating in a "networked" business environment. As far as the business world is concerned the customer, who is perceived as the "king", is the driver of change in the market place. Their changing attitudes are pushing businesses to rethink their strategies. In general, business environment is characterized by unpredictability and changeability. Therefore, adopting a more integrated approach to supply chain (SC) relationship management has been increasingly viewed as a way of meeting changing customer needs (Eyong, 2009, as cited in Aseffa, 2011).

A supply chain encompasses all the parties that involved, directly or indirectly, in fulfilling a customer request. The supply chain includes manufacturer, suppliers, transporters, warehouses, retailers and even customers themselves. Within each organization, such as a manufacturer, the supply chain includes all function involved in receiving and filling a customer request. These functions includes new product development, marketing, operation, distribution, finance, customer service and other function that related to serving customer request (Chopra and Meindl, 2007).

This is due to the fact that, nowadays the new source of business competition lies outside the walls of organizations, and it is determined by how effectively companies link their operations with their supply chain partners such as suppliers, manufacturers, distributors, wholesalers, retailers and end customers. Therefore, Supply chain management offers a management philosophy to manage activities and integrate with down-streams, up-streams as well as firms internal supply chain operations (Silver. et al., 1998, as cited in Aseffa, 2011).

Decisions made within supply chains play a significant role in the success or failure of an organization. Effective supply chain management (SCM) can yield significant benefits for the supply chain because it provides for a strategic view of the supply chain. SCM can be seen as the

strategic management of all the traditional business functions that are involved in any supply chain flow, upstream or downstream, across any aspect of the supply chain (Mentzer, 2004).

To achieve this, clear supply chain strategies have to be formulated and executed. Supply chain strategies can be defined as strategies required for managing the integration of all the supply chain activities through improved supply chain relationships to achieve a competitive advantage for the supply chain (Hines, 2006).

Basically, there are three different supply chain strategies. They are lean, agile and a combination of lean and agile (hybrid) supply chain strategies (Raturi& Evans, 2005). Although lean supply chains also have elements of agility and agile supply chains have elements of leanness, a lean supply chain is primarily a set of organizations directly linked by upstream and downstream flows of information, products and finances that collaboratively work to reduce cost and waste while agile supply chains primarily utilize differentiation strategies aimed at being responsive and flexible to customer needs. Hybrid supply chains can be defined as the combination of lean and agile supply chain strategies that exploit the benefits of both lean and agile supply chains (Jacobs et al., 2009).

Nowadays, the manufacturing industry in developing countries has been facing unprecedented competitiveness pressure generated by the new business trends. To cope with this pressure, the manufacturing industries have tried to upgrade their operations by using different manufacturing techniques such as Total Quality Management, Business Process Reengineering and Lean Technology, and others. Despite these efforts, the manufacturing industry in developing countries has not yet made their share of markets. This drives industry to get additional efficiency from their production systems. Effective supply chain becomes increasingly critical factor for business success. Companies versus companies have been replaced with supply chain versus supply chain competitiveness strategy. However, the number of companies that have truly integrated their supply chains to take advantages of this opportunity is still small (Hosseini et al, 2012).

Manufacturers know that a fluid supply chain keeps their products moving from the beginning stages of production all the way to their customers' hands. A misaligned supply chain can lead to

higher costs, lower quality, and poor customer service. Companies that gain a deeper understanding of their supplier's capabilities and their own needs, and then diligently use that knowledge to improve their overall supply chain efficiency, can dramatically strengthen their business and gain a competitive advantage (Joachim and Joan, 2009).

According to Aseffa (2011), currently, the Ethiopian business environment is becoming customer driven, competitive and technology based. Hence, it is unquestionable that companies should build an integrated and efficient supply chain system through which resources would flow in a seamless and instantaneous manner across the supply chain. The current practices of Ethiopian manufacturing industries with regard to supply chain management is traditional in that, partners involved across the supply chain act independently in designing, developing and executing strategies with minimum effort made to align strategies with the partners doing business with them particularly suppliers, whole sellers, distributors, and customers.

The objective of the article was to assess supply chain strategy implemented by selected paint manufacturing organizations located in Addis Ababa. Therefore, the investigator had, thus, been inspired to conduct a study to assess the supply chain strategy implementation in selected paint manufacturing firms located in Addis Ababa and forward possible suggestions that would enable the company to be competitive.

1.2 An Overview of Paint Industry in Ethiopia

Ethiopia is currently enjoying a boom in construction, in part due to government initiatives and incentives dating from 2004. Commercial and residential real-estate construction has grown in response to the high demand. The government is investing heavily in the construction of public housing projects, hydroelectric dams, irrigation and roads. The construction sector is a major source of revenue for the government, accounting for more than 10% of 'large taxpayer' revenues (Construction Ahead 2008) (John & Nebil, 2010). It is the country's second largest employer after the agricultural sector, and the largest source of urban employment (John & Nebil, 2010).

Ethiopia is an emerging country showing continuous high economic growth during the last 10 years. The construction sector is one of the flourishing sectors. Not only in Addis Ababa, but

in all bigger and small cities huge office buildings and real estate houses are being erected. This has created an increased demand for interior and exterior finishing products, such as paints.

Ethiopian paint factories supply their products only to the local market. However, preparations are underway to study the market segment and the products (paints) in the neighboring Eastern Africa countries. Regarding value distribution of 1997EC(2004-5) total industrial sector, chemical and chemical byproducts sub sector contribute 13%, food & beverages sub sector contribute 45% (has the largest share) and non metallic sector contribute 13% which stood second in the chemical & chemical byproducts sub sector. Therefore, paint factories contribution to the industrial sector is a significant one which needs due attention to its development (Abel, 2006).

From the 1997 budget year statistical data from the total industrial sector of 102,000 human resources, the chemical sector incorporates about 3,075 workers which is 3% of the total. Studies from the ministry of trade industry indicates that paint factories whether they are privately owned or publicly they didn't operate at full capacity which is due to shortage of chemical raw material and market (Abel, 2006).

Even though an elaborated sector wise market share studies was not done, the Nefas Silk paint factory five years strategic plan indicates that it has estimated its market share to be around 30% to 40%. This could give some picture of market share condition of other paint factories (Abel, 2006).

According to AACCSA 2015-2016 trade directory, there are 11 paint manufacturing firms in Ethiopia, out of them eight paint manufacturing firms are located in the metropolitan city Addis Ababa. These paint factories include Bright paint factory, Derba paint manufacturing, Inter Emirate paints factory (Inter National paints), Jelaram paints factory (Abay paints), Kadisco chemical industry, MBI (Dil paints), Nefas Silk paint factory and Zemili paints factory (Mega paints). These paint manufacturing firms play a significant role in the development of construction industry in the nation.

The factories have different size whole seller agents in the city of Addis Ababa which distribute their products to retailers. In addition the factories have well established wholeseller agents

throughout Ethiopia distribute the products through different retailers. The factories also served their customers at sales points (outlets) found at the factory (Mesfine, 2006).

1.3 Statement of the Problem

Competition in diverse industrial and a service sector has increased to unimaginable levels in the past years. Factors such as product technological maturity, a greater number of suppliers in the market, free trade and the advantage of scale that competitors with global reach have, are approximating diverse industrial sectors to product “commoditization” (loss of differentiation) (Herman, 2013).

In order to face this challenging competitive environment, organizations are developing several approaches for the business strategy, such as innovation, advantages in costs, the development of value-added services or a mix thereof, among others. At the same time, in the last ten years, the supply chain function has become a key element for competing and differentiating itself in the markets given that within its functional role it is in charge of coordinating the flow of information, products and money from suppliers, passing through the manufacturing and transformation process to then reaching the customers, thus strongly affecting the organization’s competitiveness factors such as product cost, working capital, the speed with which it reaches the market and service perception, among others (Herman, 2013).

According to Aseffa (2011), currently the Ethiopian business environment is becoming customer driven, competitive and technology based. Hence, it is unquestionable that companies should build an integrated and efficient system through which resources would flow in a seamless and instantaneous manner across the supply chain.

The current practices of Ethiopian manufacturing industries with regard to supply chain management is traditional in that, partners involved across the supply chain act independently in designing, developing and executing strategies with minimum effort made to align strategies with the partners doing business with them particularly suppliers, whole sellers, distributors, and customers. A research conducted by Abel (2015) discovered that supply chain management of most manufacturing firms located in Addis Ababa especially in the garment factories is not well organized and functioning and have a poor implementation of supply chain management systems.

Manufacturers know that a fluid supply chain keeps their products moving from the beginning stages of production all the way to their customers' hands. A misaligned supply chain can lead to higher costs, lower quality, and poor customer service. Companies that gain a deeper understanding of their supplier's capabilities and their own needs, and then diligently use that knowledge to improve their overall supply chain efficiency, can dramatically strengthen their business and gain a competitive advantage (Joachim and Joan, 2009).

Recently, many firms have been focusing on achieving productivity gains in their operations by implementing best practices. However, there is a relatively lack of research and literature about experience of the implementation of appropriate supply chain strategies aligned with business strategy for manufacturing industry in developing countries context (Fasika, 2014).

Many scholars state that SC strategy must reflect the corporate strategy (Chopra & Meindel, 2007). According to a survey conducted by Harrison et al. (2002), two-thirds of all respondents thought that their SC strategy was significant or highly significant in terms of business strategy (Harrison & New, 2002). There still exists a major gap between business strategies and SC strategies (Rose, 2012).

In addition to the above conclusions, prior researches conducted by Fasika (2014) and Aseffa (2011), try to assess whether supply chain practices exercised in manufacturing and agro processing industries in Ethiopian context. However, whether those manufacturing firms appropriately implement properly aligned optimal supply chain strategy with their business strategies haven't been studied yet.

Therefore, this research paper has been desired to assess the extent to which appropriate supply chain strategy implemented in the paint manufacturing firms located in Addis Ababa. A questionnaire survey was applied to explore the extent to which best supply chain strategy implemented in paint manufacturing firms located in Addis Ababa.

1.4 Basic Research Questions

The main research question of this research study can be stated as: Do paint manufacturing firms located in Addis Ababa implement an appropriate supply chain strategy aligned with their business strategy?

In order to answer the main research question, the following secondary questions were used:

- ✓ What is the level of supply chain strategy alignment with business strategy?
- ✓ What is the implemented supply chain strategy based on product characteristics?
- ✓ What is the implemented supply chain strategy based on manufacturing characteristics?
- ✓ What is the implemented supply chain strategy based on the postponement characteristics?
- ✓ What is the implemented supply chain based on the decision drivers of SCM?

1.5 Objectives of the Study

1.5.1 General Objective

The purpose of this study was to investigate supply chain strategies employed by paint manufacturing firms located in Addis Ababa. More specifically this study was aimed to assess whether the companies implement appropriate supply chain strategy properly aligned with their business strategic activities.

1.5.2 Specific Objectives

- To identify the level of supply chain strategy alignment with business strategy.
- To identify implemented supply chain strategy based on product characteristics.
- To identify implemented supply chain strategy based on manufacturing characteristics.
- To identify implemented supply chain strategy based on postponement characteristics.
- To identify implemented supply chain strategy based on the decision drivers of SCM.

1.6 Significance of the Study

The findings of this study will rebound to the benefit of paint companies considering that supply chain strategy plays as an important role in the paint industry in today's dynamic and highly competitive market environment.

The greater demand for being competitive in the global market justifies the need for more effective and appropriate business management approaches like applying appropriate supply chain strategy. Thus, the supply chain managers of paint manufacturing firms that apply the recommendations that are forwarded at the end of this study will be able to select the appropriate supply chain strategy for their particular company to achieve competitive advantage in the market.

The findings of this study is believed to overlay the way for educators or training institutions to consider when designing training on the issues relating to the SCM in Ethiopian context. In addition to this, this study is believed to have importance to the academicians which may serves as a spring board to conduct further and more detail study in the area; this is because at the current situation there are only few researches were conducted in the related area in Ethiopia.

Furthermore, for the researcher, the study will help uncover critical problems in designing and implementing supply chain strategies in the paint manufacturing firms located in Addis Ababa that may researchers were not explore before.

1.7 Scope of the Study

The general intent of this study was only to assess the supply chain strategy implementation of paint manufacturing firms located in Addis Ababa.

This study mainly identify and assess different supply chain activities and practices of the selected paint factories that lead to identify whether those companies follow the appropriate supply chain strategy or not. Also, this study desire to test supply chain practices with regard to product characteristics, manufacturing characteristics, postponement characteristics and supply chain decision drivers to identify which type of supply chain strategy the case company follows.

This study was conducted with limited amount of financial resources and time framework. Due to this reason, it is highly possible not to have enough finance and time to do everything that seems to be essential for a thorough thesis project. Therefore, finance and time were limiting factors that have a bearing to the outcome. As a consequence, additional studies might be needed in order to generalize and validate the practicability of the results obtained.

1.8 Limitation of the study

The research sample didn't incorporate all the SC participants throughout the system namely: the suppliers and it did not incorporate customers at different regional levels, in the sample due to time constrained so that it couldn't be generalized/applied to the complete SC of the industry under investigation.

1.9 Organization of the Thesis

This project paper is organized into five chapters: Chapter one contains the introduction part dealing with back ground of the study, the research problem, objectives of the study, scope and significance of the study. The second chapter discusses the literature review about the subject matter. In chapter three the research methodologies will be presented. In chapter four presents results and discussion of the study and finally, chapter five presents the major findings, conclusions and forwarded suggestions.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This section reviews supply chain strategies. It begins by defining supply chain and supply chain management before examining the various possible strategies and exploring the characteristics that define these strategies.

2.1 Supply Chain and Practices in SCM

2.1.1 Definition of Supply Chain

Various definitions of a supply chain have been offered in the past several years as the concept has gained popularity.

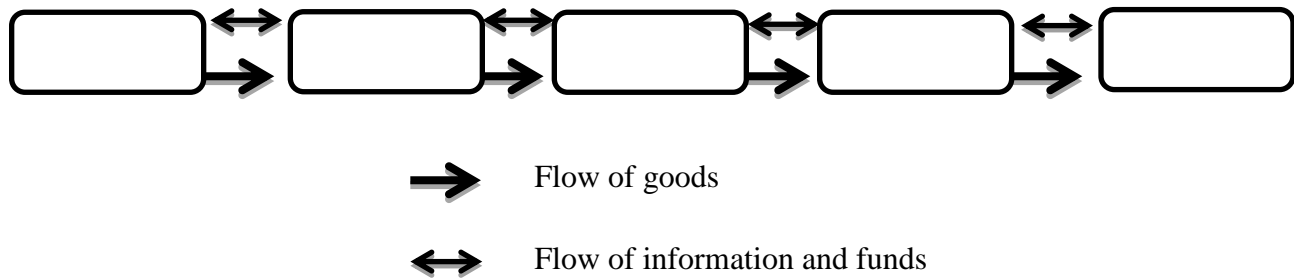
The APICS Dictionary describes the supply chain as:

“the processes from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies; and the functions within and outside a company that enable the value chain to make products and provide services to the customer” (Cox, et al, 1995).

Chopra and Meindl (2001) defined supply chain as a sequence of (decision making and execution) processes and (material, information and money) flows that aim to meet final customer requirements and take place within and between different supply chain stages. The supply chain not only includes the manufacturer and its suppliers, but also (depending on the logistics flows) transporters, warehouses, retailers, and consumers themselves. It includes, but is not limited to, new product development, marketing, operations, distribution, finance, and customer service. An example of a basic supply chain is shown in Figure 2.1.

For the purpose of this research, a *supply chain* is defined as a group of entities directly involved in the flows of products, services, finances, and information from a source to a customer (Mentzer, et al., 2001).

Figure 2.1: The basic supply chain



(Source: Chopra and Meindl, 2001)

2.1.2 Definition of Supply Chain Management (SCM)

SCM has been defined differently. These varieties of definitions often carry through to the extent that the key people in the same organization are not speaking about the same things, when they discuss the concept of SCM (Monczka and Morgan, 1997).

Literature on SCM stresses the need for collaboration among successive actors, from primary producer to final consumers, to better satisfy consumer demand at lower costs (Lambert and Cooper, 2000). A driving force behind SCM is the recognition that sub-optimization occurs if each organization in a supply chain attempts to optimize its own results rather than to integrate its goals and activities with other organizations to optimize the results of the chain (Cooper et al., 1997). Martin Christopher (2005) also defines SCM as:

“...the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole.”

SCM focuses on the management of relationships. For the purpose of this research, SCM defined as follows:

SCM is the integrated planning, co-ordination and control of all business processes¹ and activities in the supply chain to deliver superior consumer value at less cost to the supply chain as a whole whilst satisfying requirements of other stakeholders in the supply chain (e.g. government and NGO's).

2.1.3 SCM Practices

Companies that have a winning strategy and a business model that utilizes best practices in supply chain management (SCM) will remain strong and continue to grow in marketplace (Heninrich, et al, 2005).

In most corporations, SCM is important from both a cost and revenue perspective. It is not unusual for supply chain costs to represents 50 percent to 75 percent of the total expenditures. Thus, properly managing the supply chain can create a competitive advantage (McKinsey, 2010).

According to academic researchers in the Department of Supply Chain Management and Marketing Sciences (SCMMS) at the Rutgers Business School, the following 10 best practices shown in table 2.1, if implemented properly, can create a strong competitive advantage for a firm in today's dynamic market.

Table 2.1: SCM Practices

SCM Practices	Description
Begin with customers	A strong supply chain always collaborates directly with its customers on the forecasting of demand, replenishing of supplies, and on the development of innovative products, services and business processes
Engage senior management	SCM can create real value for a firm but, to be really successful, SCM needs a seat at the management table
Manage and recruit SCM talent	Top management must take a leadership role in the acquisition and development of highly skilled supply chain professionals
Build supply chain with intelligence	In order to be efficient and effective in managing these supply chains, one must implement a world class Enterprise Resource Planning (ERP) system to support its information flows
Optimize IT network	Implementing this strategy has the potential to dramatically reduce costs and improve customer service
Outsource non-core functions and processes	If strategically aligned and properly managed, outsourcing has the potential to dramatically lower costs, increase flexibility, and allow focusing on core competencies
Adopt and implement a best-in-class sourcing strategy.	Implementing a professional procurement organization and strategic sourcing initiatives that consolidate suppliers is the fastest way to save money, increase margins and improve operating profits
Manage risk	It is extremely important to manage these risks and implement plans to mitigate major exposures where possible
Establish key performance indicators/metrics	It is critical that SCM has a robust set of metrics or key performance indicators (KPIs) that drive the right behavior
Build SC sustainability	Supply chain strategies must not only consider how to meet immediate business objectives, but also evaluate if these strategies enable a strong economic, environmental and socially responsible future

Source: Heninrich, et al, (2005)

2.2 Supply Chain Relationship Management (SCRM)

As Murray, et al (2005) described that supply chain relationship management (SCRM) is concerned with the management of the supplier relationship. Chartered Institute of Procurement and Supply (CIPS) explained that SCRM involves managing the interfaces between

organizations supplying goods and/or services to an organization in order to maximize their value. It is about building relationships that work towards supporting an “effective, financially beneficial environment”.

Within SCRM there are several types of relationships. According to Murray, et al (2005), there are three groups of SCRM. However, BIFM (2015) classifies them in to five, transactional; contractual; value Added; collaborative; and partnership. On the other hand, Connolly, et al (2002) classifies them in to six, transactional, collaboration, strategic alliances, integration, funding alliance, and cost sharing. For the purpose of this research, these SCRM categorized in to three as shown in table 2.2 below.

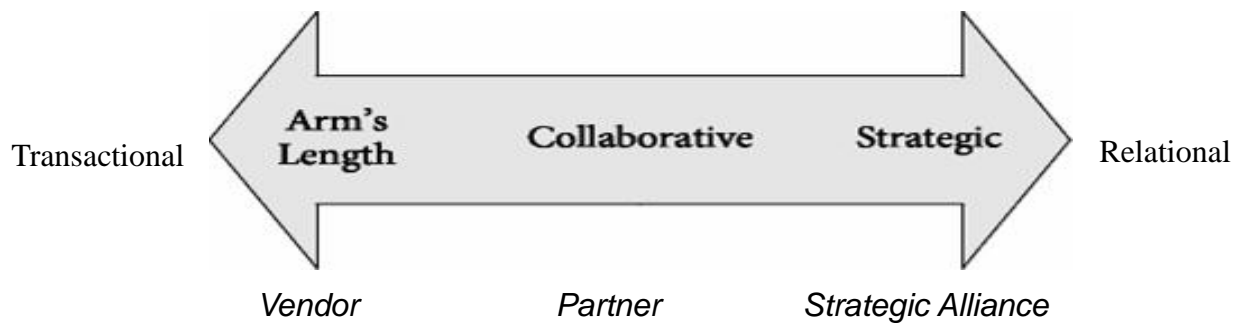
Table 2.2: Types of SCRM

Types of SCRM	Description
Transactional Relationship	<ul style="list-style-type: none"> • There is little trust between supplier and customer. • Both parties in a vendor relationship are said to be at “arm’s length”.
Collaborative Relationship	<ul style="list-style-type: none"> • There is a close working relationship between the supplier and customer, which delivers value and benefit to both parties. • There is a defined commitment between each party outlining the nature of the relationship and its goals. • There is also a structure of shared responsibility, accountability, resources and rewards.
Strategic Partnership	<ul style="list-style-type: none"> • Both parties derive mutually beneficial value from the relationship • The relationships are strategic alliances, where skills and resources are shared to achieve mutual benefits.

Source: Adopted from Murray, et al (2005), BIFM (2015), and Connolly, et al (2002)

Figure 2.2 graphically shows this relationship continuum. Notice that both extremes have their benefits and limitations, and thus the hybrid strategies would have similar strengths and limitations as well.

Figure 2.2: Relationship Perspectives



Source: (Murray, et al, 2005)

2.3 The Concepts and Nature of Supply Chain Strategy

According to Michael Porter's (1980) definition, supply chain strategy is the connection and combination of activities and functions throughout the value chain, in order to fulfill the business value proposal to customers in a marketplace.

A supply chain strategy is part of the overall business strategy, designed around a well-defined basis of competition (innovation, low cost, service, quality). It is integrated with the marketing strategy, customers' needs, the product strategy, and power position. Supply chain strategies are pivotal to the success of most contemporary businesses and equally important for not-for-profit organizations (Hines, 2006). Strategies exist, whether they are planned or not. In other words all organizations have a de facto strategy. To be effective, an organization's supply chain strategy must align with its competitive strategy (Porter, 1980).

For the purpose of this research, *supply chain strategy* is defined as the patterns of decisions related to supply chain activities, in accordance with the overall corporate competitive strategy (Narasimhan, et al, 2008). Included in these activities are the procurement of raw materials, the sourcing of products, capacity planning, demand management, and communication across the supply chain, as well as the activities related to the delivery of products and services, such as warehouse and inventory management, transportation and distribution

2.3.1 Types of Supply Chain Strategy

Wang et al. (2004) classified supply chain under three groups: Lean Supply Chain (LSC), Agile Supply Chain (ASC) and Hybrid Supply Chain (HSC). There are 6 groups in total when Reverse

Supply Chain (RSC), Green Supply Chain (GSC) and Global Supply Chain (GSC) are also classified in addition to the abovementioned groups although they are not used as a strategy alone. Only two of these classifications that are lean supply chain and agile supply chain can be considered as supply chain strategies. The others can be regarded as policies that can be used in addition to these two strategies rather than a supply chain strategy alone (Duran & Akci, 2015).

There are two generic and one hybrid strategies in supply chain management, namely the lean and agile strategies. Here, 'leanness means developing a value stream to eliminate all waste, including time, and to enable a level schedule', while 'agility means using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile marketplace. Hybrid supply chains can be defined as the combination of lean and agile supply chain strategies that exploit the benefits of both lean and agile supply chains (Manson-Jones et al., 2000). The combination of lean and agile paradigms within a total supply chain strategy enable the positioning of the **decoupling point (postponement)** so as to best respond to a volatile demand downstream, yet still provide a level schedule upstream from the decoupling point (Hull, 2005). Basic characteristics of lean and agile supply chain strategies summarized in Table 2.3 as follows.

Table 2.3: Characteristics of lean and agile supply chain supply chain strategies

Distinctive attributes	Lean supply chain	Agile supply chain
Product type	Functional	Innovative
Market Demand	Predictable	Volatile
Market winners	Cost	Lead time and availability, service level
Product variety	Low	High
Product Life cycle	Long	Short
Manufacturing focus	Maintain high average utilization rate	Deploy excess buffer capacity
Production process	Make-to-stock	Make-to-order; Assemble-to-order; Build-to-order
Postponement	Not required	Necessary
Inventory management	Finished goods inventory	Parts, components, subassembly
Supplier selection	Low cost, consistent quality, and on-time delivery	Flexibility, fast delivery, high-performance design quality
Facilities (e.g. capacity and location)	Little excess capacity (lower costs through maintaining high average utilization rate); Narrow focus; Few central facilities serve wide areas	Excess capacity (maintain excess buffer capacity to meet unexpected demand); Flexible manufacturing; Many smaller facilities closer to customers
Transportation (e.g. cost, frequency and lead times)	Shipments are few, large; Slow, cheaper modes (choose lowest cost mode of transport); Shorten lead time as long as it does not increase cost	Frequent shipments; Fast and flexible mode (choose fastest means of delivery depending on need, regardless of cost); Invest aggressively in ways to reduce lead time even if it means incurring higher cost
Information	Cost of information drops while other costs rise	Collect and share timely, accurate data
Pricing strategy	Lower margins, higher volume, price is the prime customer driver	Higher margins as price is relatively less important to the customer

Source: Compiled from Fisher (1997), Christopher (2003); Bruce *et al.* (2004); Hines (2004); Hugos (2006), Webster (2008), Chopra & Meindl (2010); and Ambe et al (2011)

2.3.2 The Decoupling Point in Supply Chain

Naylor et al. (1999) used the decoupling point concept to divide the part of the supply chain that responds directly to the customer (demand is variable and high product variety) from the part of

the supply chain that uses forward planning and a strategic stock to buffer against the demand variability (demand is smooth and products are standard). The authors proposed the designation “leagile” supply chain where the lean principles are followed up to the decoupling point and agile practices are followed after that point.

The decoupling point may be termed the point at which real demand penetrates upstream in a supply chain. The decoupling point therefore is the point in the product flow stream to which the customer’s order penetrates and where real-time data and forecast-driven activities meet. The position of the decoupling point is important in any supply chain design. The challenge to supply chain managers is in seeking to develop lean strategies up to the decoupling point, but agile strategies beyond that point. Generic products can be pushed up to the decoupling point (at low cost and with low risk) but must wait for real demand data before it can be customized (to meet specific customer demand) (Christopher, 2002).

To realize this, firms can make use of the concept of postponement. Postponement refers to a concept whereby activities in the supply chain are delayed until a demand is realized. Postponement is used to manage and the final operations that result in a customized product for the end customer are performed when the uncertainty is removed (Taylor, 2004).

2.4 Designing Supply Chain Strategy

This section consists of the elements that need to be considered when designing supply chain strategy. The elements are categorized into three groups: the characteristics of the product; the manufacturing characteristics; and the decision drivers of supply chains, as discussed below.

2.4.1 Product Characteristics

Different attributes of a product has big impact on the type of supply chain strategy companies follow. As a result, understanding of the customer and market uncertainty, functional and innovative attributes, the product life cycle, and the market winner are essential when determining the relationship between product characteristics and supply chain strategies (Intaher, 2012).

A. The customer and market uncertainty

Due to customers' increasing demand not only for quality, but also for service, organizations obliged to choose the right type of supply chain strategy; they must understand the customer and the supply chain uncertainty. Within the supply chain environment, there are six key market variables that determine the attributes of a supply chain structure: volume; time; variety; service level required; price; and rate of change, innovation, and new product development. Hines, (2006) noted that, to be able to understand the customer and market uncertainty, it is important to identify customer segments to determine similarities between groups of customers so that their needs can be satisfied efficiently. Customers in different segments may have similar needs to other segments, but in most cases, the differences will be greater than the similarities (Chopra & Meindl, 2010).

B. Functional versus innovative products

Fisher (1997) developed a framework to help managers understand the nature of their product and devised a supply chain that can best satisfy that demand. According to Fisher's (1997) framework, products can be categorized as either primarily functional or primarily innovative. Functional products are stable, have predictable demand, long life cycles, and low profit margins. In contrast, innovative products are those that compete through their design or on the basis of a unique concept. These products tend to have short life cycles, high profit margins and greater variety, which further increases unpredictability (Jacobs et al., 2009).

C. Market winners and market qualifiers

The concept of order qualifiers and order winners leads to the specification of an appropriate manufacturing strategy. According to Jacobs et al. (2009) qualifiers are the basic criteria that permit a firm's product to be considered as a candidate for purchase by customers; while order winners are the criteria that win an order (they differentiate the products and services of one firm from another).

There is a critical connection between the concepts of 'qualifiers' and 'winners' and 'lean' and 'agility'. The lean paradigm is most powerful when the winning criterion is cost. However, when service and customer value enhancement are prime requirements for market winning, then it is

likely that agility will become the critical dimension. The market winner for agile supply chains is service, while the market winner for lean supply chains is cost (Rahimnia et al., 2010).

2.4.2 Manufacturing Characteristics

A. Manufacturing techniques

According to Taylor et al (2004), the most common manufacturing strategies are make-to-stock, make-to-order, configure to-order, and engineer-to-order. Make-to-stock (MTS) is the best strategy for standardized products that sell in high volumes. Make-to-order (MTO) is the preferred strategy for customized products or products with infrequent demand. Companies following this strategy produce a shippable product only with a customer order in hand. Configure-to-order (CTO) is a hybrid strategy in which a product is partially completed to a generic level, and then finished when the order is received. This is the preferred strategy when there are many variations to the end product, and the manufacturer wants a lower finished-goods inventory and shorter customer lead time than make-to-order can deliver. Engineer-to order (ETO) shares many of the characteristics of make-to-order. This strategy is used in industries in which complex products and services are created to unique customer specifications.

B. Production process

There are two main cycles of production strategy in a manufacturing process. These are mass production and mass customization. Mass production relies heavily on a company's ability to accurately forecast demand. These forecasts guide the organization's decision regarding operations and production. Mass production is built towards forecast-driven production and employs a lean supply chain strategy, while mass customization is built towards customer-driven production and employs an agile supply chain strategy (Zhan & Chen, 2006).

C. Push and pull supply

Different companies' supply chain flows can be triggered either in by actual demand signals (pull-based supply chains), a forecast of future demand (push-based supply chains), or hybrid approaches. Push-based supply chains cater to stable demand of homogenized products (lean supply chain strategy), whereas production and distribution decisions are based on long-term forecasts. In the pull-based supply chain, the entire supply chain is driven by actual demand

(agile supply chain strategy). Here, the time to market becomes long, depending on the type of supply chain and the number of players involved (Diaz, 2005).

2.4.3 Supply Chain Decision Drivers

Supply chain management emphasizes the relationships between partners in the supply chain, integrating activities from the supplier to the customer while adding value, maximizing profitability through efficiency, and achieving satisfaction. Effective supply chain management calls for an understanding of each driver and how it operates. Decision drivers directly affect the supply chain strategic choice. These decision drivers include integration and collaborative relationships, information technology, production/facilities, inventory decisions, sourcing decisions, location decisions, transportation and pricing (Sayuti, 2011).

A. Production facilities

The essential decision that managers face when making facility decisions is how to resolve the trade-off between responsiveness and efficiency (Taylor, 2004). If factories and warehouses are built with a lot of excess capacity, they can be very flexible and respond quickly to swings in product demand. Facilities where all, or almost all, capacity is being used are not capable of responding easily to fluctuations in demand. In contrast, capacity costs money, and excess capacity is idle capacity not in use and not generating revenue. So the more excess capacity there is, the less efficient the operation becomes.

B. Inventory

Holding large amounts of inventory allows a company or an entire supply chain to be very responsive to fluctuations in customer demand. However, creating and storing inventory is a cost and to achieve high levels of efficiency, the cost of inventory should be kept as low as possible. An organization can be responsive by stocking high levels of inventory for a wide range of products (Chopra & Meindl, 2010).

C. Location

Location refers to where supply chain facilities are geographically located. It also includes the decisions related to which activities should be performed in each facility. The responsiveness

versus efficiency trade-off here is whether to centralize activities in fewer locations to gain economies of scale and efficiency, or to decentralize activities in many locations to be closer to customers and suppliers and so be more responsive (Nel & Badenhorst-Weiss, 2010)..

When making location decisions, managers need to consider a range of factors that relate to a given location, including the cost of facilities, the cost of labor, skills available in the workforce, infrastructure conditions, taxes and tariffs, and proximity to suppliers and customers (Nel & Badenhorst-Weiss, 2010). Location decisions have a strong impact on the cost and performance characteristics of a supply chain.

D. Transportation

When companies think to decide concerning transportation, the trade-off between responsiveness and efficiency must be considered in the choice of transport mode. Fast modes of transport are very responsive but also more costly. Slower modes, such as ship and rail, are very cost efficient but not as responsive. Since transportation costs can be as much as a third of the overall operating cost of a supply chain, these decisions are very important (Taylor, 2004).

E. Information

Perfect and timely information allows a firm to minimize inventories, improve routing and scheduling of transportation vehicles, and generally improve customer service levels. According to Nel & Badenhorst-Weiss (2010), end-to-end visibility of information is a key enabler for an agile supply chain. High levels of responsiveness can be achieved when companies collect and share accurate and timely data generated by operations.

F. Sourcing

Sourcing decisions are crucial because they affect the level of efficiency and responsiveness the supply chain can achieve. Outsourcing certain processes to other parties may increase a supply chain's efficiency, but may reduce its responsiveness because of possibly longer lead times to achieve economies of scale (Nel & Badenhorst-Weiss, 2010). In contrast, responsiveness can be increased by gaining state-of-the-art products.

G. Pricing

Pricing affects the customer segments that choose to buy the product, as well as customer expectations. This directly affects the supply chain in terms of the level of responsiveness required, as well the demand profile that the supply chain attempts to serve.. Steady prices also ensure that demand stays relatively stable(Chopra & Meindl, 2010).

Therefore, pricing affects the behavior of the buyer of the product, thus affecting supply chain performance. Customers who value responsiveness will pay more for higher levels of customer service (Nel & Badenhorst-Weiss, 2010).

Based on the above elements from literatures, product characteristics, manufacturing characteristics and SCM decision drivers, a particular company can identify and implement appropriate supply chain strategy. The next section helps to choose supply chain strategy.

2.5 Framework for Choosing Supply Chain Strategies

Several factors that could be used to determine supply chain strategies. Some of the aspects include the demand and supply characteristics of a product; the market winners and market qualifiers; the product life cycle; pull and push strategy; and manufacturing strategies. Ambe, et al (2011) adopted three steps and frameworks, as shown in figure 2.3, to choose and implement appropriate supply chain strategy.

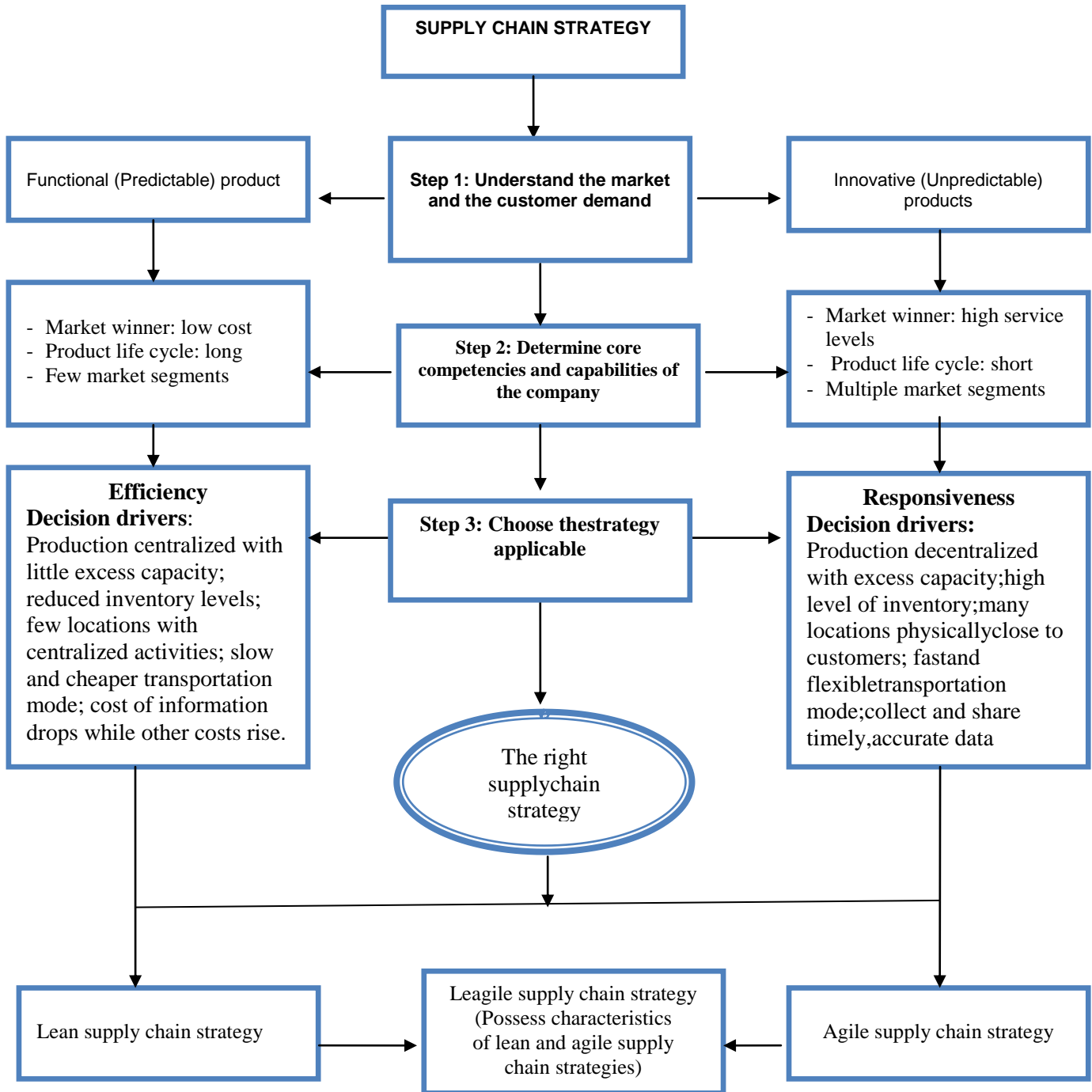
Step 1: Understand the market and the nature of customer demand

Customers today are more demanding, not just of quality, but also of service. Therefore, for an organization to make the right decision on the type of supply chain strategy, it must understand the customer and the supply chain uncertainty (Hines, 2006; Chopra and Meindl, 2010).

Step 2: Define core competencies and capabilities of the company

Supply chains have different characteristics but all supplychains have two important attributes: cost and service(Taylor, 2004). Hines (2006) and Chopra and Meindl (2010) explain that supply chain capabilitiesinclude the ability to respond to wide range of quantitiesdemanded, meet short lead times, handle a large varietyof products, build highly innovative products, meet a highservice level and handle supply uncertainty.

Figure 2.3: Framework for choosing and implementing supply chain strategies



Source: Adapted from Ambe, et al (2011), Hines(2006), Chopra and Meindl (2010), and Taylor (2004),

To be able to determine the capabilities of the supply chain, a trade-off between responsiveness and cost is required (Taylor, 2004 and Hines, 2006). The most important consideration in deciding where to place a company along the trade-off curve is the choice of the corporate positioning strategy (Taylor, 2004).

Step 3: Choose the strategy applicable

Designing a supply chain strategy that can meet the customers' needs is what customer focus is all about. Therefore, the customer needs should be the main focus. This point of focus helps an organization to achieve strategic fit. To achieve complete strategic fit, an organization must ensure that all its functions maintain consistent strategies that support the competitive strategy. All sub-strategies within the supply chain, such as manufacturing, inventory and purchasing, need to be consistent with the supply chain level of responsiveness. Firms with different locations along the spectrum must have different supply chain design and different functional strategies that support the spectrum (Chopra and Meindl, 2010).

2.6 Linking Supply Chain to Business Strategy

According to Rhonda, et al (1999), a company must develop objectives for the management of the supply chain based on corporate objectives. From these higher level objectives, a set of detailed objectives can be developed for each process within the supply chain. This cascading method serves to integrate the supply chain processes with the overall enterprise direction and provides measures for monitoring and execution. Supply chain management can be utilized to be a point of differentiation for a company.

Ross (2008) claimed that the strategies of supply chain management were based on three different approaches. The first approach is cost leadership. This approach covers principles and rules to increase the productivity of the chain and profitability by reducing the wastes in the chain. This is also known as lean supply chain strategy. The second approach is the operational performance or differentiation. This approach is centred around the agility of the supply chain executive function against the variability of demands as much as possible. This method is also known as supply elasticity, adaptive supply chain management, delivery elasticity, demand-oriented supply network management or agile supply chain management. The last approach is

the customer-centred or focus-approach. This approach aims to improve the supply chain capacity and resources on a continuous basis and increase the total value provided to the customers. This method is also known as close/relational supply chain management.

Manufacturers know that a fluid supply chain keeps their products moving from the beginning stages of production all the way to their customers' hands. A misaligned supply chain can lead to higher costs, lower quality, and poor customer service. Companies that gain a deeper understanding of their supplier's capabilities and their own needs, and then diligently use that knowledge to improve their overall supply chain efficiency, can dramatically strengthen their business and gain a competitive advantage (Joachim and Joan, 2009). The authors also argued that a well-aligned supply chain can help avoid system overloads and last-minute production changes, and will reduce variability in the system. In addition to this, an aligned supply chain leads to a more stable system, and in stable systems it is easier to identify and react to change. Firms can operate efficiently and is better able to respond to customer needs.

In a perfect world, a truly aligned supply chain strategy would involve only one decision maker who has access to all available information. The person would also have the incentives and power to make decisions that minimize supply chain costs. But, everyone doesn't live in the perfect world. Instead, supply chain managers often try to maximize their budgets rather than minimize supply chain costs, and as a result, make decisions that raise overall outlays. The further we get from the perfect world scenario, the more likely the supply chain will be misaligned (Joachim and Joan, 2009).

According to Joachim & Joan (2009), there are several ways of aligning a company's supply chain strategy with its business strategy. Some managers believe that there are universal definitions of good or bad supply chains. Most often see companies attempt to build the most efficient supply chain, regardless of whether their market strategy is to compete on price. Optimizing cost and inventory may come at the expense of lead-times, flexibility and risk. A company's supply chain needs to compete the same way the company does. Supply chains cannot be measured in absolutes or designed in isolation of the corporate strategy.

Walingford (2011) proposed six steps to align supply chain with corporate strategy. These are:

1. Define and communicate a clear business strategy.
2. Identify the areas of company's business strategy that are enabled by the supply chain.
3. Align supply chain performance metrics with the business strategy.
4. Structure company's supply chain to optimize the strategic goals.
5. Align incentives end to end.
6. Keep refreshing the strategy and alignment process.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter presents the methodologies that will be used in this study: the choice of particular research approach, designs, sampling techniques, sources of data and data collection tools along with an appropriate justification associated with each approach.

3.1 Research Approaches

There are three types of research frameworks which include either quantitative or qualitative or both (mixed approach)(Creswell, 2013).

Quantitative research consists of those studies in which the data concerned can be analyzed in terms of numbers. Research can also be qualitative, that is, it can describe events, persons and so forth scientifically without the use of numerical data. On the other side, qualitative research is more open and responsive to its subject. Both types of research are valid and useful. They are not mutually exclusive. It is possible for a single investigation to use both (mixed) methods (Best and Khan, 1989).

The third type, mixed research approach, is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone (Creswell, 2013).

In this research study, a quantitative research approach was applied. The rationale for using this approach was to assess and describe the extent of supply chain strategy implementation in Ethiopian paint manufacturing firms located in Addis Ababa. A quantitative approach was appropriate to measure the extent of SC strategy implementation by setting different criteria or parameters.

3.2 Research Design

This study was intended to investigate supply chain strategy implementation based on fundamental theories, principles and management philosophies that are supposed to be effective

parameters just to evaluate the actual implementation of supply chain strategy of the paint manufacturing firms located in Addis Ababa. Accordingly, the case companies' existing SCM practices with regard to their product, manufacturing characteristics and supply chain decision drivers were assessed. That means the purpose of this research is to assess supply chain strategy implementation from the underlying facts and /or actual circumstances existing within the case companies with regard to SCM practices and describing the facts. Therefore, the researcher preferred to use descriptive research type, which helps to use quantitative data analysis.

3.3 Population of The Study

Population is the totality of all subjects that conform to a set of specifications, comprising the entire group of persons that is of interest to the researcher and to whom the research results can be generalized. Eligibility criteria specify the characteristics that people in the population must possess in order to be included in the study (Polit & Hungler 1999). In this study the target population was all paint manufacturing firms located in Addis Ababa. According to AACCSA trade directory 2015-2016, there are eight paint manufacturing firms located in Addis Ababa.

3.4 Sample And Sampling Techniques

3.4.1 Sampling Techniques

Even though supply chain management is necessary for both manufacturing and service companies, this study was targeted on the paint manufacturing companies particularly those firms located in the metropolitan city of Addis Ababa, Ethiopia.

Because of the study requires in-depth understanding of SCM practices and strategies, random sampling was not appropriate. The desired sampling method for this study was the non-probabilistic or purposive (judgmental) sampling technique. The rationale for using purposive (judgmental) sampling was to concentrate on those who have expert knowledge about supply chain practices, marketing and operations of the paint products in those paint manufacturing firms in the ground. Therefore, specific participants from all paint manufacturing firms located Addis Ababa were selected according to their strategic positions in the paint manufacturing firms.

3.4.2 Sample and Sample Size

Since the study requires an in-depth understanding of SCM practices and strategies, expert knowledge was required. The basic criterion for choosing the respondents was an employee at a senior SCM position in those paint factories. Therefore, by using purposive sampling technique, 32 supply chain managers from all paint manufacturing companies located in Addis Ababa were included in the study. The respondents included managers who are directly related with the topic under investigation namely logistics /supply chain/ procurement managers; production managers; marketing and finance management heads of all paint manufacturing firms located in Addis Ababa.

3.6 Data Collection Procedure and Instruments

Data collection of this study has two phases. A combination of exploratory and descriptive research design was employed. The exploratory research was conducted in the first phase of the study (towards the formulation of the problem statement and research questions that guide the study) while the second phase of the study was descriptive. In the first phase of this study, secondary data were collected from different books, articles, journals, magazines, and brochures. In the second phase, primary data were collected through a questionnaire which has been distributed to logistics/supply chain managers; production managers; marketing and demand management heads of all paint manufacturing firms located at Addis Ababa.

Since this study was based on quantitative approach and cross sectional survey research design, data collection instrument that has been employed in this study was structured close ended questionnaires.

The data were collected to investigate the supply chain strategy implementation in the paint manufacturing firms located in Addis Ababa to find out answers for the research questions. Questionnaire survey which was adapted from previous studies contributed by Ambe (2014) and Tompkins(2014), that contains questions about the extent of SC strategy implementation with regard to product characteristics, manufacturing characteristics, postponement and supply chain decision drivers with supply chain strategies from Ethiopian paint manufacturing firms located in Addis Ababa were distributed to 32 participants.

Close ended questionnaire in a 5 point likert scales will be used to collect data from the 32 sample respondents. The questionnaire has 5 rating scales ranging from 1- very low to 5- very high and the 5-point likert scale- 1 for strongly disagree, 2 for disagree, 3 for neither disagree nor agree (neutral), 4 for agree and 5 for strongly agree.

The close ended questionnaire was comprised the following sections:

- Section A. Questions related to demographic information of the respondents.
- Section B. Questions related to the degree of supply chain strategy alignment with business strategy
- Section C: Assessing the supply chain strategies

3.7 Data Analysis Techniques

In general there are two types of data analysis techniques namely: qualitative and quantitative where by the choice of these methods greatly depend on the type of information the researcher has at hand. If most of information collected contains numerical, the analysis calls for quantitative tools and descriptive statistics can be used to characterize the data. On the other extreme, if most of the data collected are in words which mean data gathered using individual interviews, open –ended questions and focus group discussion, it is logical enough to apply qualitative data analysis tools (Cresswell, 2013).

Therefore, as determined in the data collection tool for this study, data were collected by using questionnaire. Accordingly, the collected data were analyzed quantitatively. The collected data were analyzed descriptively, using statistical package for social sciences (SPSS) and Excel work Sheet. Particularly, descriptive statistics like percentage scores, means and standard deviation were employed.

3.8 Ethical Considerations

Ethical substances are the anxieties and dilemmas that arise over the proper way to accomplish research, more specifically not to create harmful conditions for the subjects of inquiry, humans, in the research process (McGivern, 2006). McGivern (2006) believes that it is useful for researchers to follow a practical approach in which they ask questions and push themselves hard to reach answers: —The researcher needs to be honest about the purpose of his or her research.

The researcher was very much aware of the big responsibility to be sensitive and respectful of research participants and their basic human rights and fully endorse the Ethical Code of the University. In particular, the researcher ensured the following throughout the study:

- i. Explicate the aim and objectives of the study as well as the procedures to be followed up front to everybody taking part in the research;
- ii. Make it clear to them that participating in the study is voluntary, and that should they for some reason want to withdraw from it, they have the right to voluntarily do so at any time; and
- iii. Their privacy was respected at all time and that everything they share has been treated as confidential.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

This chapter focuses on analyzing, interpreting and presenting of the major findings of the study with a view to assessing the extent to which proper supply chain strategies are implemented by paint manufacturing firms located in Addis Ababa. This chapter has four main sections. The first section deals with demographic information of the sample respondents. The second section presents the degree of supply chain alignment with business strategy. The third section presents the descriptive statistics of assessed inbound, internal and outbound supply chain practices exercised in the paint manufacturing firms located in Addis Ababa. The fourth section deals with descriptive statistics of implemented supply chain strategies with regard to the paint manufacturing firms' product, manufacturing and postponement characteristics. The findings of the study are presented and analyzed using tables and figures.

Out of thirty two (32) questionnaires distributed to respondents twenty seven (N=27) were returned and found valid and used for the analysis. This accounts for 84.34% of response rate. One of the paint manufacturing firms was unwilling to participate in the study. Thus, based on the responses obtained from the respondents data presentation and analysis were made as follows.

4.1 Demographic Characteristics of Respondents

Table 4.1 presents demographic characteristics of the sample respondents. The survey includes complete responses from 27 respondents. Of the total sample respondents, 81.18% were male and only 18.52% were female. About 81.48% age of respondents was laid between 30 and 50 years. With regards to educational status of the respondents, surprisingly all respondents have first degree and above. With regard to experience, more than 85% of the respondents have six and above years of experience within the case companies and it is sufficient to judge and give views. This is because when the respondents are more and more experienced within the organization they have better opportunity to know more and more about the organization

Table 4.1 Demographic characteristics of the sample respondents

Variables	Items	Total number of respondents	
		N	%
Gender N=27	Male	22	81.18
	Female	5	18.52
Age N=27	Below 30 year	3	11.11
	30 – 40 years	10	37.04
	41 – 50 years	12	44.44
	Above 50 year	2	7.41
Educational Background N=27	Elementary school	0	0.00
	High school	0	0.00
	College diploma	0	0.00
	First degree	9	33.33
	MA and above	18	66.67
Years of Experience N=27	Below 1 year	1	3.70
	2 – 5 years	3	11.11
	6 – 10 years	13	48.15
	Above 10 years	10	37.04

N is number of respondents.

(Source: Researcher's survey)

4.2 Descriptive Analysis

As it were revealed in the methodology part, the designed method for this study is descriptive statistical analysis. The collected data were analyzed descriptively, using statistical package for social sciences (SPSS) and Excel work Sheet. Particularly, descriptive statistics like percentage scores, means and standard deviation were employed. The findings of the study are presented and analyzed using tables and figures.

4.2.1 Alignment of Supply Chain with Business Strategy

The second part of the interview questionnaire examined the alignment of supply chain strategy with business strategy.

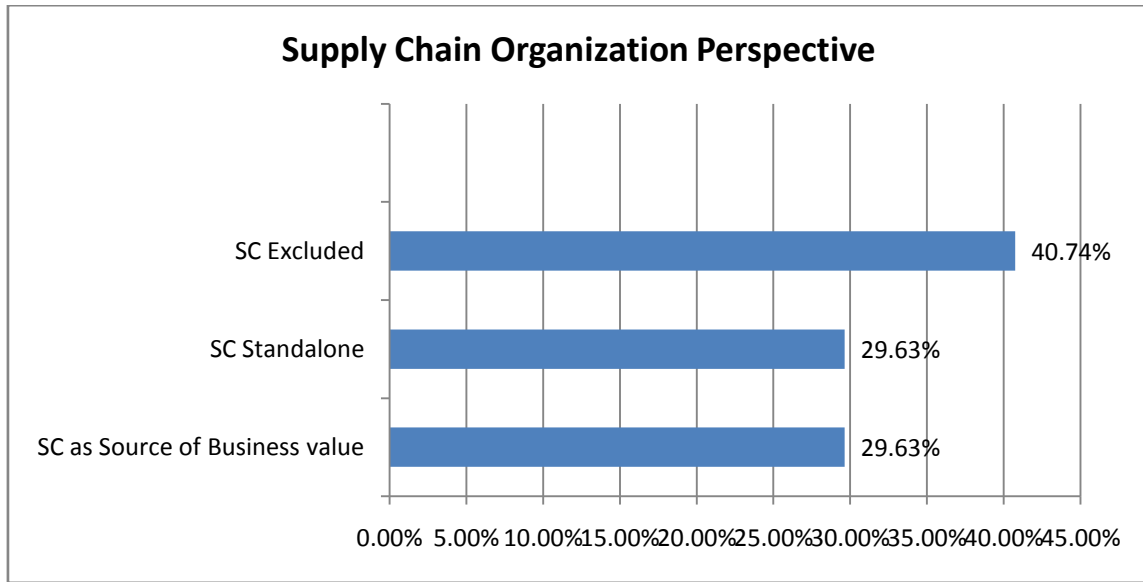
The first survey question of this section explores how supply chain is viewed overall in the individual's paint manufacturing organization. Respondents asked to choose from the following options:

1. Very negative perspective that supply chain is excluded from plans for change.
2. Middle of the road answer on supply chain being a standalone function.
3. Positive response about supply chain being a value-add and competitive advantage.

Figure 4.1 indicates the frequency distribution (in %) per perspective. For the purposes of analysis the following abbreviations were used: *SC Excluded* for Supply chain is excluded from plans for meaningful change in our company perspective, *SC as standalone* for Supply chain is considered as a standalone operating function within our company and *SC source of business value* for Supply chain is considered as a source of business value and competitive advantage.

More than 40% of the respondents feel chain is excluded from plans for meaningful change. 29.63% of the respondents consider supply chain as a standalone operating function within the company, and 29.63% believe that the supply chain is a source of business value and a competitive advantage.

Figure 4.1: Supply Chain Overview – Percentage of Respondents



It is fair to conclude that if an individual believes supply chain is excluded from plans for meaningful change, then alignment of supply chain and business strategy is not exactly taking place. It can also mean there is a poor or nonexistent business or supply chain strategy in place, which might also apply to the response that supply chain is a standalone function. If it is standalone, it is not aligned with business strategy or anything else.

Next, and arguably the most critical survey question, respondents asked to what degree there is alignment of supply chain and business strategy in their paint manufacturing firm. The results are presented using percentages. Figure 4.2 indicates the frequency distribution (in %) per statement.

More than 55% of the respondents expressed their feelings from strongly disagree to neither disagree nor agree. This implies that there is low level of alignment between supply chain and business strategy.

Figure 4.2: Degree of Alignment – Percentage of Respondents

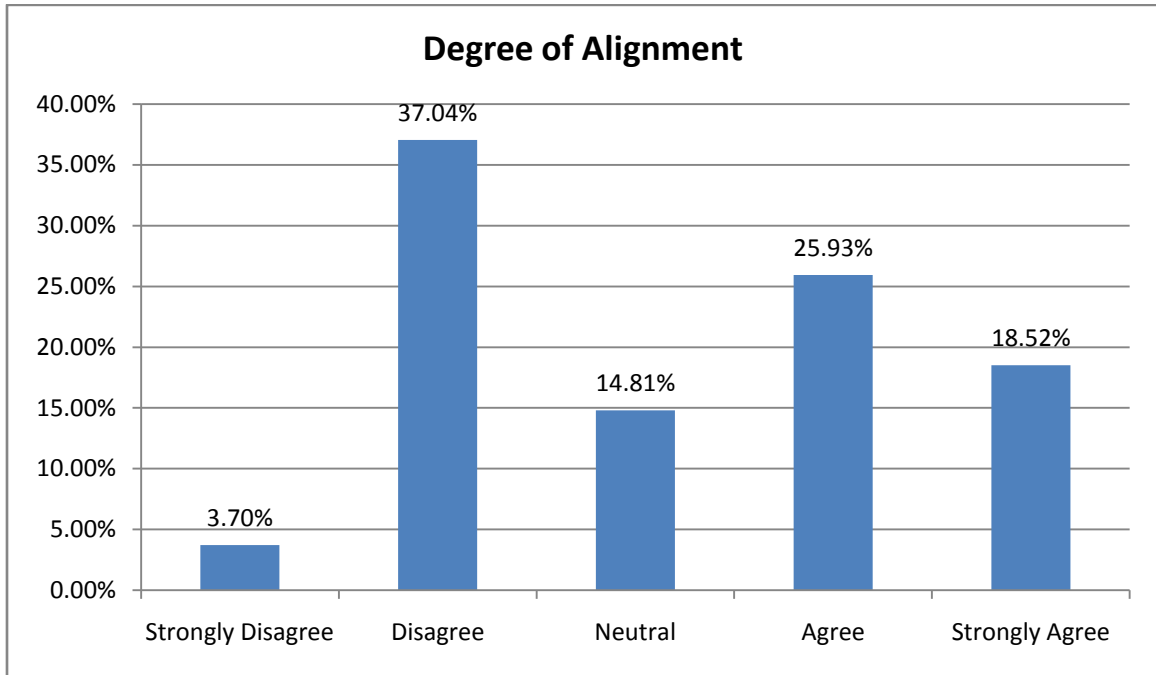


Table 4.2 shows the degree of agreement on the level of alignment between supply chain strategy and business strategy within each paint manufacturing firm. For the purpose of analysis, BP represents Bright Paints, DP represents Derba Paints, IEP represents Inter Emirate Paints, AP represents Abay Paints, KP represents Kadisco Paints, NSP represents Nefas Silk Paints and ZP represents Zemili Paints.

Table 4.2 Degree of Alignment – Percentage of Respondents by paint firm

	Mean Level of Agreement						
	BP	DP	IEP	AP	KP	NSP	ZP
There is an alignment of supply chain with business strategy in our company	2	1.89	2.38	4.25	3	4	4.25

The results in table 4.2 indicate that, on average, Bright, Derba and Inter Emirate paints tended to disagree that there is alignment of SC with their business strategy (means of 2.00, 1.89 and 2.38 respectively), while Abay, Nefas Silk and Zemili paints agreed (means of 4.25, 4.00 and 4.25 respectively). These results revealed that some paint firms didn't have alignment of SC with their business strategy.

4.2.2 Assessing Implemented Supply Chain Strategies (SCS)

The fourth part of the questionnaire assessed implemented supply chain strategies with regard to the paint firms' product characteristics, manufacturing characteristics and the decision drivers of SCM.

4.2.2.1 Assessing SCS based on product characteristics

In this subsection, respondents were asked to rate their agreement on statements relating to their paint product characteristics using a five-point Likert response format from 1 (strongly disagree) to 5 (strongly agree). The questions comprised five SC practices and the results are presented using percentages. For convenience of presentation of the analysis, the following abbreviations were used: SD for strongly disagree; D for disagree; N for neither agree nor disagree; A for agree; and SA for strongly agree. The analysis is presented in percentages per SC practice. Table 4.3 indicates the frequency distribution (in % responses) per statement.

According to table 4.3 below, majority (74.07%) of the respondents their paint products are standard products. More than half (66.66%) of the respondents agreed that the demand for their products was stable. 44.44% of the respondents disagreed that the market winner (most important sales criteria/point) for their paint product was cost, while 29.63% agreed. These results indicate that paint manufacturing firms located in Addis Ababa not only produce standardized paint products. 62.95% of the respondents disagreed that the order lead time (order to delivery) took longer times.

Table 4.3: Responses regarding product characteristics

Product x-tics	Percentage (%)					
	N	SD	D	N	A	SA
Our paint products are standard products (no customization)	27	3.70	14.81	7.41	62.96	11.11
The demand for the product (paint) is stable	27	0.00	18.52	11.11	51.85	14.81
The market winner (most important sales criteria/point) for the products is cost	27	3.70	40.74	25.93	18.52	11.11
The order lead time (order to delivery) takes longer time	27	11.11	51.85	14.81	3.70	18.52
Our forecast for the products is relatively accurate	27	0.00	29.63	25.93	40.74	3.70

On the other hand, 44.44% of the respondents agreed that their forecast for their product was relatively accurate. According to survey, most of the paint products are standardized that had a relatively stable demand, low lead time as well as relatively accurate forecasting. However, the market winner for the paint products is not only based on cost strategy. Hence the paint firms produce both functional (standard) and innovative paint products, implying this study includes both lean and agile supply chain strategies followed by paint manufacturing firms located in Addis Ababa.

Table 4.4 presents the mean level of agreement of the respondents regarding product characteristics by paint firms. For the purpose of analysis, BP represents Bright Paints, DP represents Derba Paints, IEP represents Inter Emirate Paints, AP represents Abay Paints, KP represents Kadisco Paints, NSP represents Nefas Silk Paints and ZP represents Zemili Paints.

Table 4.4 Responses regarding product characteristics by paint firms

Product x-tics	Mean Level of Agreement						
	BP	DP	IEP	AP	KP	NSP	ZP
Our paint products are standard products (no customization)	4.25	4.25	2	2.5	4	4.25	3.75
The demand for the product (paint) is stable	4.25	4.14	4	3.75	3.5	3.25	3
The market winner (most important sales criteria/point) for the products is cost	3	3	3	3	2.5	2.5	3.5
The order lead time (order to delivery) takes longer time	2.25	2.25	2.33	2	2	3.5	2
Our forecast for the products is relatively accurate	3.5	3.39	2.67	3	2.25	4	3.5

The results in table 4.4 indicate that, Inter Emirate and Abay paints tended to disagree that their paint product was a standard product (means of 2.00 and 2.50 respectively), while the remaining paint firms agreed that their paint product was standard. Most of the paint firms, except Zemili paints, agreed that demand for their paint product was stable. Zemili paints agreed that the market winner for their paint product was cost (mean of 3.50), while the remaining paint firms (Bright, Derba, Inter Emirate, Abay, Kadisco and Nefas Silk paints) either disagreed or were neutral that the market winner was cost (a mean of 3.00, 3.00, 3.00, 2.25 and 2.25 respectively). Except Nefas Silk paints with mean 3.50 agreement, majority of the paint firms disagreed that order lead time for their paint product was longer time (means of 2.00 to 2.25). Most of the paint firms

agreed that they implement relatively accurate forecasting, while Inter Emirate and kadisco paints disagreed that they implement relatively accurate forecasting (mean 2.67 and 2.25 respectively).

Overall, the results show that paint product of most paint firms were standard products (functional), while some of them was not a functional product, the demand for their paint product was stable - hence a mismatch in the product characteristics..

4.2.2.2 Assessing SCS based on manufacturing characteristics

The respondents' perceptions were sought on manufacturing characteristics. This subsection comprised seven SC practices and was measured using a five-point Likert response format, ranging from 1 (strongly disagree) to 5 (strongly agree). For convenience of presentation of the analysis, the following abbreviations were used: *SD* for strongly disagree; *D* for disagree; *N* for neither agree nor disagree; *A* for agree; and *SA* for strongly agree. The analysis is presented in percentages. Table 4.5 indicates the frequency distribution (in % responses) per SC practice.

According to survey, more than half (59.26%) of the respondents agreed or strongly agreed that their paint products had a low manufacturing cost strategy. The majority (81.48%) of the respondents agreed or strongly agreed that they made provision in their manufacturing strategy for customers' demands (specifications) for their paint products. Next to this, respondents asked whether to change their manufacturing strategy quickly according to their customer demands for their paint product, 81.48% of the respondents agreed and strongly agreed. Majority (85.19%) of the respondents at least agreed that some parts in the production process for their paint product were customized to meet certain customers' orders.

Table 4.5: Responses regarding manufacturing characteristics

Activities	Percentage (%)					
	N	SD	D	N	A	SA
We have a low manufacturing cost strategy	27	0.00	14.81	25.93	55.56	3.70
We make provision in our manufacturing strategy for customers' demands (specifications)	27	0.00	3.70	14.81	66.67	14.81
We change our manufacturing strategy quickly according to customer demands	27	0.00	7.41	11.11	66.67	14.81
We customize some parts in our production process to meet certain customer orders	27	0.00	3.70	11.11	59.26	25.93
We keep minimum inventory in the production process	27	0.00	0.00	3.70	25.93	70.37
We manufacture on the basis of projected forecast	27	7.41	37.04	7.41	29.63	18.52
We have a pull system with specific customer orders	27	11.11	37.04	7.41	37.04	7.41

The majority (96%) of the respondents specified that they kept minimum inventory in the production process for their paint product. 48.15% of the respondents indicated that their paint products were manufactured on the basis of the projected forecast, while 44.15% disagreed. 44.45% of the respondents at least agreed that their paint products had a pull system with specific customer orders, while 48.15% disagreed.

The results show that the majority of the respondents followed a low manufacturing cost strategy for their production line. Hence the focus of the manufacturing process was on reducing waste while enhancing customer value (lean supply chain). Also, most of the paint manufacturers followed a make-to-order (MTO) strategy based on demands from dealers (agile supply chain strategy). The manufacturers kept minimum inventory in the production process (lean supply chain strategy). The manufacturing process was based on projected forecast. The majority of the respondents disagreed using a pull system in their production system. Push-based supply chains cater to stable demand of homogenized products (lean supply chain strategy), whereas production and distribution decisions are based on long-term forecasts. In the pull-based supply chain, the entire supply chain is driven by actual demand (agile supply chain strategy) (Diaz, 2005).

From the above results, it can be concluded that paint manufacturing firms located in Addis Ababa didn't apply consistent manufacturing strategy. This implies that there is evidence of a silo mentality in the manufacturing side of the supply chain - hence an area for further investigation.

Table 4.6 presents the mean level of agreement of the respondents regarding manufacturing characteristics by paint firms. For the purpose analysis, BP represents Bright Paints, DP represents Derba Paints, IEP represents Inter Emirate Paints, AP represents Abay Paints, KP represents Kadisco Paints, NSP represents Nefas Silk Paints and ZP represents Zemili Paints.

Table 4.6: Responses regarding manufacturing characteristics by paint firm

Manufacturing Activities	Mean Level of Agreement						
	BP	DP	IEP	AP	KP	NSP	ZP
We have a low manufacturing cost strategy	3	3.11	4.33	3.75	4	2.75	3.5
We make provision in our manufacturing strategy for customers' demands (specifications)	3.5	3.5	4	4.5	3.5	4.25	4.25
We change our manufacturing strategy quickly according to customer demands	4	3.89	4	4	3.25	4.5	3.75
We customize some parts in our production process to meet certain customer orders	3.5	3.61	4	4.75	3.5	4.5	4.5
We keep minimum inventory in the production process	5	5	4.33	5	5	4.25	4
We manufacture on the basis of projected forecast	3.25	2.69	4.33	1.75	2.75	3.5	3.75
We have a pull system with specific customer orders	2	2.44	3.67	1.75	2.75	3.75	3.75

As indicated in table 4.6, except Bright paints neutral with mean and Nefas Silk paints disagreement with mean 2.75 that indicates agile SC strategy, all of the paint firms agreed that they employed a low manufacturing cost strategy (means of 3.11 to 4.33) which indicates an lean SC strategy. All of the paint firms agreed that they made provision in the manufacturing strategy for their customers' demands (specifications) (means 3.50 to 4.50), they changed their manufacturing strategy quickly according to customer demands (means 3.75 to 4.50), they customized some parts of their production process to meet certain customers' orders (means 3.50 to 4.75) and they kept minimum inventory in the production process (means 4.00 to 5.00) which indicates an agile supply chain. Bright, Inter Emirate, Nefas Silk and Zemili Paints agreed that

they manufacture paints on the basis of projected forecast (means 3.25 to 4.33) which indicates agile SC strategy, while Derba, Abay and kadisco paints did not agree (means 1.75 to 2.75), indicates lean SC strategy. Inter Emirate, Nefas Silk and Zemili paints agreed that had a pull system with specific customer orders (means 3.65, 3.75 and 3.75 respectively) which indicates agile Sc strategy, while the others disagreed that they had a pull system with specific customer orders (a mean of 2.00), indicating a lean supply chain strategy.

From the results, it is clear that all the paint manufacturing firms didn't apply consistent SC strategy. There is a mismatch between their manufacturing strategies and SC strategies.

4.2.2.3 Assessing supply chain strategy based on postponement characteristics

Supply chain practices relating to postponement characteristics were also used to establish the relationships between manufacturing characteristics and supply chain strategies. A postponement strategy shows the position (decision point) where a strategy changes from one to another (from a lean to agile supply chain). The respondents were asked about their level of agreement on the application of postponement by means of six SC practices using a five-point Likert response format, ranging from 1 (strongly disagree) to 5 (strongly agree). For convenience of presentation of the analysis, the following abbreviations were used: *SD* for strongly disagree; *D* for disagree; *N* for neither agree nor disagree; *A* for agree; and *SA* for strongly disagree. Table 4.7 indicates the frequency distribution (in %) per SC practice.

As illustrated in table 4.8, there are six postponement characteristics used to explore the type of SC strategy implemented by Addis Ababa paint manufacturing firms. Accordingly, the survey reveals that two-third of the respondents (66.67%) at least disagreed that their strategic suppliers kept inventory in the form of modules, components and materials. On the other side, the majority of the respondents (88.89% and 96.26% respectively) at least agreed that the paint manufacturing firms as well as their dealers kept fully finished paint products in stock. Majority of the respondents (85.18%) of the respondents at least disagreed that they kept work-in-progress inventory to be customized for specific customer orders. More than three-quarters of the respondents (81.48%) at least disagreed that modules, components and materials are only ordered from strategic suppliers when the customer specifications were known. Majority of the respondents (88.89%) disagreed that they made provision for finalization of some features to

their paint products at the dealership based on final customer requests. According to the survey result, the paint firms exhibit a lean supply chain strategy according to the postponement characteristics.

Table 4.7: Responses regarding postponement characteristics

SC practices	Percentage (%)					
	N	SD	D	N	A	SA
Our strategic suppliers keep inventory in the form of modules, components and materials	27	25.93	40.74	22.22	11.11	0.00
We keep fully finished products in stock	27	3.70	0.00	7.41	40.74	48.15
Our dealers keep fully finished products in stock	27	0.00	0.00	3.70	29.63	66.67
We keep work -in-progress inventory to be customized for specific customer orders	27	51.85	33.33	3.70	3.70	7.41
We only order modules, components and materials from our strategic suppliers when the customer specifications are known	27	48.15	33.33	7.41	7.41	3.70
We make provision for finalization of some features to our products at the dealership, based on final customer request	27	48.15	40.74	7.41	3.70	0.00

Therefore, the above result implies that strategic suppliers didn't keep inventory in the form of modules, components and materials any decoupling point throughout the supply chain (66.67% disagreement of respondents) and similarly the paint manufacturing firms didn't kept work-in-progress inventory in stock indicating that a decision about final assembly is not made at the manufacturer (decoupling point), based on final customer requirements. Overall, the findings suggest that the majority of the respondents didn't have any form of postponement.

Table 4.8 presents the mean level of agreement of the respondents regarding postponement characteristics by paint firms. For the purpose analysis, BP represents Bright Paints, DP represents Derba Paints, IEP represents Inter Emirate Paints, AP represents Abay Paints, KP represents Kadisco Paints, NSP represents Nefas Silk Paints and ZP represents Zemili Paints.

Table 4.8: Responses regarding postponement characteristics by paint firm

SC practices	Mean Level of Agreement						
	BP	DP	IEP	AP	KP	NSP	ZP
Our strategic suppliers keep inventory in the form of modules, components and materials	2	2.11	2	1.75	1.5	3	2.75
We keep fully finished products in stock	3.75	3.86	4	4.75	4.75	4	4.75
Our dealers keep fully finished products in stock	5	4.78	4.33	4.75	5	4	4.75
We keep work -in-progress inventory to be customized for specific customer orders	2.25	1.81	1.67	2.75	1	1.75	2
We only order modules, components and materials from our strategic suppliers when the customer specifications are known	1.5	1.81	1.33	2.75	1	2	2.5
We make provision for finalization of some features to our products at the dealership, based on final customer request	1.5	1.5	2	1.75	1	2	2

As indicated in table 4.8, overall, all the paint manufacturers disagreed that their strategic suppliers kept inventory in the form of modules, components and material (means of 1.50 to 3.00), they kept work-in-progress inventory to be customized for specific customer orders (means of 1.00 to 2.75), they only ordered modules, components and materials from its strategic suppliers when the customer specifications were known (means of 1.00 to 2.75), and they made provision for adding some features to their paint products (means of 1.00 to 2.00). On the other hand, all the paint manufacturers agreed that they kept fully finished paints products in their stock and also their dealers did. Overall, the results indicated that the pain firms employ a lean SC strategy.

4.2.2.4 Assessing supply chain strategies based on the decision drivers of SCM

Table 4.9 below depicts, seven supply chain decision drivers developed from literature were used to evaluate the case companies' implemented supply chain strategies throughout their SC. Respondents were asked to indicate the extent to which they agreed with statements relating to the seven SC decision drivers (production, inventory, location, transportation, information, supplier selection and pricing decisions). A five-point Likert response format with end points 1

(strongly disagree) to 5 (strongly agree) was used and the mean and standard deviation results are presented in the table below.

Production

With regard to production, the result with 4.04 mean and standard deviation of 0.81 indicated that paint manufacturing firms located in Addis Ababa tended to implement flexible manufacturing process, which designated an agile supply chain. According to Ambe (2014), an agile supply chain is characterized by excess capacity and flexibility.

Inventory

With regard to inventory, the respondents indicated that they didn't implement the practice of working on a strict JIT system and keeping inventory holding in the production process to a minimum disagree with a mean value of 1.74, which indicated an agile supply chain strategy. A strict JIT system is a characteristic of a lean supply chain strategy.

Location

Regarding location, having decentralized distribution centers (stores) to serve dealers scored mean value of 4.19 and standard deviation of 0.79 which indicated that the paint manufacturing firms located in Addis Ababa have a responsive (agile) supply chain strategy.

Transportation

Concerning to the transportation, two exclusive statements were used. Respondents were asked their level of agreement on the statements. According to the survey result, making small and frequent shipments to strategic customers and receiving small and frequent shipments from their suppliers scored a value of 2.56 and 2.22 respectively. This result shows that small and frequent shipments were not made between supply chain partners (efficiency) which indicated that the paint firms exhibited lean supply chain strategies.

Information

The mean value of forecasting information is used to build master production schedules and create delivery dates and demand was used to quickly transmit and reflect real demand accurately are 3.78 and 3.67 respectively. The use of forecasting information by the paint

manufacturing firms indicates a lean supply chain strategy, while quick transmission of information on orders indicates an agile supply chain strategy.

Table 4.9: Responses regarding decision drivers of the supply chain

Supply chain decision drivers		N	Mean	Standard Deviation
Production	We have flexible manufacturing processes	27	4.04	0.81
Inventory	We work on strict Just In Time (JIT) system and therefore keep inventory holding in the production process to a minimum	27	1.74	1.23
Location	We have decentralized distribution centers (stores) to serve our dealers	27	4.19	0.79
Transportation	We make small and frequent shipments to our strategic customers	27	2.56	1.31
	We receive small and frequent shipments from our strategic suppliers	27	2.22	1.25
Information	Information helps us to build master production schedule (forecasts) and create delivery dates	27	3.70	0.75
	Information is used on actual demand to be transmitted quickly to reflect real demand accurately	27	3.67	0.92
Supplier Selection	We select suppliers based on low price/cost	27	3.30	0.95
	We select suppliers on the basis of high -quality standards	27	3.96	0.71
	We select suppliers on the basis of dependability or sustainability	27	4.15	0.46
	We select suppliers on the basis of flexibility	27	3.74	0.71
Pricing Strategy	Our pricing strategy is determined by balancing supply and demand	27	4.30	0.82
	Our pricing strategy is based on low margins (low margins based on high sales volume)	27	2.19	1.08
	Our pricing strategy is based on differentiation in the market	27	2.37	1.24

Supplierselection

To assess the supplier selection criterion of paint manufacturing firms located in Addis Ababa, four basic criteria were presented. According to the survey result, dependability scored the

highest mean value of 4.15. Quality was used as a criterion for selecting suppliers (a mean of 3.96). Flexibility was used as a criterion (a mean of 3.74). Low price/cost was also used as a criterion (a mean of 3.30).

The above survey result shows that supplier selection was based more on sustainability or dependability and quality (which are qualifiers for both lean and agile supply chain). However, flexibility criterion was used for selecting suppliers which is a winner criterion for an agile supply chain strategy. On the other hand, cost was also used as a criterion to a moderate extent which dictates the winner criterion for a lean supply chain strategy.

Pricing strategy

Pricing directly affects the supply chain in terms of the level of responsiveness required, as well as the demand profile that the supply chain attempts to serve. Steady prices also ensure that demand stays relatively stable (Chopra & Meindl, 2010).

Regarding pricing strategy, respondents were asked to indicate their level of agreement on three basic pricing principles. The survey results show that pricing strategy based on balancing supply chain demand scored a mean value of 4.30, based on differentiating products (a mean of 2.37) and low margins (low margins and high volume) scored a mean value of 2.19. The results show that balancing pricing and demand was the most implemented practice. Therefore, based on the pricing characteristics, the paint firms implemented a lean supply chain strategy.

Table 4.10 below presents the mean level of agreement of the respondents regarding manufacturing characteristics by paint firms. For the purpose of analysis, BP represents Bright Paints, DP represents Derba Paints, IEP represents Inter Emirate Paints, AP represents Abay Paints, KP represents Kadisco Paints, NSP represents Nefas Silk Paints and ZP represents Zemili Paints

Production

Based on the results stated in table 4.10 below, all the paint firms agreed that they had flexible manufacturing processes (mean agreement 3.50 to 4.67) which indicates an agile SC strategy.

4.10: Responses regarding decision drivers of the supply chain by paint firm

Supply chain decision drivers	Mean Level of Agreement						
	BP	DP	IEP	AP	KP	NSP	ZP
Production							
We have flexible manufacturing processes	4	4.11	4.67	4.25	3.75	3.5	4
Inventory							
We work on strict Just In Time (JIT) system and therefore keep inventory holding in the production process to a minimum	3	2.67	1	1	1.25	1.75	1.75
Location							
We have decentralized distribution centers (stores) to serve our dealers	5	4.56	2.67	4.5	4.25	4.25	4.25
Transportation							
We make small and frequent shipments to our strategic customers	1.75	1.64	4	2.75	1.75	3.25	3.25
We receive small and frequent shipments from our strategic suppliers	1.75	1.75	4	1.25	1.75	3.25	2.25
Information							
Information helps us to build master production schedule (forecasts) and create delivery dates	4	3.89	4	3.25	3.75	3.75	4
Information is used on actual demand to be transmitted quickly to reflect real demand accurately	4	3.33	4	4	3.25	4.25	3.75
Supplier Selection							
We select suppliers based on low price/cost	2.75	2.64	4	3.5	3.25	4.25	3
We select suppliers on the basis of high -quality standards	4.25	3.69	4	4.25	4	4.25	4
We select suppliers on the basis of dependability or sustainability	4	4.11	4	4.75	4	4	4
We select suppliers on the basis of flexibility	4	3.44	4	4	4	3.75	3.75
Pricing Strategy							
Our pricing strategy is determined by balancing supply and demand	4.25	4.47	4	4.25	4.75	3.75	4.25
Our pricing strategy is based on low margins (low margins based on high sales volume)	2.5	2.17	2	2.25	1.5	2.25	3
Our pricing strategy is based on differentiation in the market	2.5	2.17	2	1.75	1.5	3.5	3.5

Inventory

On average, all paint manufacturing firms disagreed that they work on strict JIT system and therefore keep inventory holding in the production process to a minimum (means range from 1.00 to 3.00) which indicates an agile SC strategy.

Location

All, except Inter Emirate paints (disagreement with mean 2.67), paint firms agreed that they had decentralized distribution centers to serve their dealers (means from 4.25 to 5.00). Decentralized distribution and close suppliers are indicative of an agile supply chain strategy.

Transportation

Inter Emirate, Nefas Silk and Zemili paints agreed that they made small and frequent shipments to their customers (means 3.25 to 4.00) which indicates an agile supply chain strategy. However, the rest paint firms didn't implement the practice (mean score 1.75 to 2.75) which indicates lean supply chain strategy. Inter Emirate and Nefas Silk paints agreed that they received small and frequent shipments from their suppliers (means 4.00 and 3.25 respectively) which is the indicator of agile SC strategy, while the rest paint firms disagreed that they received small and frequent shipments from their strategic suppliers (means of 1.25 to 2.25) which is the indicators of lean SC strategy.

Information

With regard to information all paint firms used forecasting information to build master production schedules and create delivery dates (a mean of 3.25 to 4.00) and used information on actual demand that is transmitted quickly to accurately reflect real demand (means of 3.25 to 4.00). Using forecasting information is indicative of a lean supply chain, while actual demand information indicates an agile supply chain. As a result all the paint firms use both methods, which is indicative of a lean and agile (leagile) supply chain strategy.

Supplier Selection

All the paint firms agreed that they used high-quality standards, the basis of dependability and sustainability and flexibility to select suppliers (means range from 3.69 to 4.75). Four of the paint firms (Inter Emirate, Abay, Kadisco and Nefas Silk) used low – cost as a criteria for selecting

their suppliers, while Bright, Derba and Zemili paints didn't. Low cost as a basic criterion indicates a lean supply chain, while flexibility indicates an agile supply chain strategy.

Pricing Strategy

All the paint manufacturing firms used pricing strategy based on balancing supply and demand (means of 3.75 to 4.75) which implies a lean SC strategy. Except Zemili paints, all paint firms disagreed that their pricing strategy wasn't based on low margins (means of 1.50 to 2.50) which indicates an agile SC strategy. Nefas Slik and Zemili paint firms used pricing strategy based on differentiation, which is a typical pricing strategy for an agile supply chain (mean 3.50 for both).

CHAPTER FIVE

SUMMARY, CONCLUSION AND SUGESTIONS

This chapter summarizes the purpose of the study, the major findings and conclusions, the study implication for theory and practice, and makes recommendation.

5.1 Summary of Findings

The purpose of this study was to assess optimal supply chain strategy implementation of paint manufacturing firms located in Addis Ababa. The actual circumstance of implementing appropriate SC strategy of the case companies' was examined with regard to their product, manufacturing characteristics and SC decision drivers properly aligned with their business strategy.

Based on the quantitative data analysis, discussion of results with respect to the basic research questions in the survey, the following are the summary of major findings of this study.

5.1.1 Supply chain organizational view and SC alignment with business strategy

Supply chain is excluded from plans for meaningful change, then alignment of supply chain and business strategy is not exactly taking place. It can also mean there is a poor or nonexistent business or supply chain strategy in place, which might also apply to the response that supply chain is a standalone function. If it is standalone, it is not aligned with business strategy or anything else.

5.1.2 Assessing implemented supply chain strategies based on product characteristics

According to Ambe (2014), many aspects of a product are significant in determining a supply chain strategy, for example, types of product, demand predictability and market standards for lead times and service. Based on these characteristics, products can be categorized as either primarily functional or primarily innovative. Functional products employ a lean supply chain strategy,

The survey result of the study reveals that paint manufacturing firms located in Addis Ababa produce standardized paint products. Two-thirds of the respondents agreed that most of the paint products have relatively stable demand as well as relatively accurate forecasting for the paint products, which indicates a functional product (associated with lean supply chain strategy) (74.07% and 66.67% agreement) respectively. 44.44% of the respondents disagreed that the market winner (most important sales criteria/point) for their paint product was cost which indicates agile supply chain strategy.

According to the results found from the survey, paint firms located in Addis Ababa produce a functional paint product which implies a lean supply chain. However, their most important sales criteria/point) for their paint product was not only cost. This result indicates an agile supply chain. It can be concluded that there is a mismatch of SC strategy in line with their business strategy in the paint manufacturing firms located in Addis Ababa.

5.1.3 Assessing implemented supply chain strategies based on manufacturing characteristics

Manufacturing characteristics is very important to assess the type of supply chain strategy applied in manufacturing firms. As illustrated in the literature above, there are two basic manufacturing characteristics. These are make-to-stock (MTS) which is tend to lean supply chain and make-to-order (MTO) which tends to agile supply chain strategy. Accordingly, the results revealed that the paints products of the firms were produced based on a low-cost manufacturing strategy for the production line (59.26% agreement) kept minimum inventory in the production process (96% agreement). These results indicate the lean supply chain strategy. On the other side, they made provision in their manufacturing strategy for customers' demands (specifications) for their paint products (81.48% agreement). They made changes in their manufacturing strategy quickly according to their customer demands for their paint product (81.48% of agreement). Furthermore, the paint firms customized their products in the production process to meet certain customers' orders (85.19% agreement), which are the indicators of MTO (associated with an agile supply chain strategy).

From the above results, it can be concluded that paint manufacturing firms located in Addis Ababa didn't apply consistent manufacturing strategy. This implies that there is a mismatch of supply chain strategy in their production line.

5.1.4 Assessing implemented supply chain strategies based on SC decision drivers

Table 5.1 below illustrates the summary of supply chain strategies implemented based on SC decision drivers by paint manufacturing firms located in Addis Ababa. As per the results shown in the table, there was a mismatch of decision drivers in line with the chosen supply chain strategies. The paint manufacturing firms apply flexible manufacturing processes (associated to agile supply chain strategy), while their pricing strategy is based on balancing supply and demand (associated to lean supply chain strategy). The paint firms also utilized quality, cost, dependability and flexibility criteria for selecting suppliers which indicate both lean (cost) and agile (flexibility) strategies. This concludes the findings relating to mismatch of practices with strategies of paint manufacturing firms located in Addis Ababa.

Table 5.1 Supply chain strategies based on SC decision drivers

Supply chain decision drivers		Supply chain strategy
Production	We have flexible manufacturing processes	Agile
Inventory	We work on strict Just In Time (JIT) system and therefore keep inventory holding in the production process to a minimum	Agile
Location	We have decentralized distribution centers (stores) to serve our dealers	Agile
Transportation	We make small and frequent shipments to our strategic customers	Agile
	We receive small and frequent shipments from our strategic suppliers	Agile
Information	Information helps us to build master production schedule (forecasts) and create delivery dates	Lean
	Information is used on actual demand to be transmitted quickly to reflect real demand accurately	Agile
Supplier Selection	We select suppliers based on low price/cost	Lean
	We select suppliers on the basis of high -quality standards	Both
	We select suppliers on the basis of dependability or sustainability	Lean
	We select suppliers on the basis of flexibility	Agile
Pricing Strategy	Our pricing strategy is determined by balancing supply and demand	Lean
	Our pricing strategy is based on low margins (low margins based on high sales volume)	Agile
	Our pricing strategy is based on differentiation in the market	Lean

(Source: Researcher's survey results)

5.2 Conclusions

Based on the results of the study obtained and summary of findings the following conclusions are given below.

- The eventual conclusion of this study is that generally, the case companies lack implementation of properly aligned supply chain strategy with their corporate strategy. Supply chain management of the paint manufacturing firms located in Addis Ababa is not well organized and functioning and has a poor implementation of supply chain management systems.

- Supply chain is excluded from plans for meaningful change, then alignment of supply chain and business strategy is not exactly taking place. It can also mean that there is a poor or nonexistent business or supply chain strategy in place, which might also apply to the response that supply chain is a standalone function. If it is standalone, it is not aligned with business strategy.
- Regarding to the supply chain practices, the results revealed that paint manufacturing firms located in Addis Ababa implemented supply chain best practices throughout their supply chain
- Regarding to supply chain strategy implemented based on product characteristics, the survey result revealed that paint firms located in Addis Ababa produce a functional paint product which implies a lean supply chain. However, their most important sales criteria/point) for their paint product was a cost which indicates agile SC. It can be concluded that there is a mismatch of SC strategy in line with their business strategy in the pant manufacturing firms located in Addis Ababa.
- Concerning to the supply chain strategy implemented based on product characteristics, it can be concluded that paint manufacturing firms located in Addis Ababa didn't apply consistently an optimal manufacturing strategy. This implies that there is a mismatch of supply chain strategy in their production line.
- The paint manufacturing firms apply flexible manufacturing processes (associated to agile supply chain strategy), while their pricing strategy is based on balancing supply and demand (associated to lean supply chain strategy). The paint firms also utilized quality, cost, dependability and flexibility criteria for selecting suppliers which indicate both lean (cost) and agile (flexibility) strategies. This concludes the findings relating to mismatch of practices with strategies of paint manufacturing firms located in Addis Ababa.

Overall, based on the survey result, it is possible to conclude that paint manufacturing firms located in Addis Ababa didn't apply appropriate supply chain strategy properly aligned with their corporate strategies.

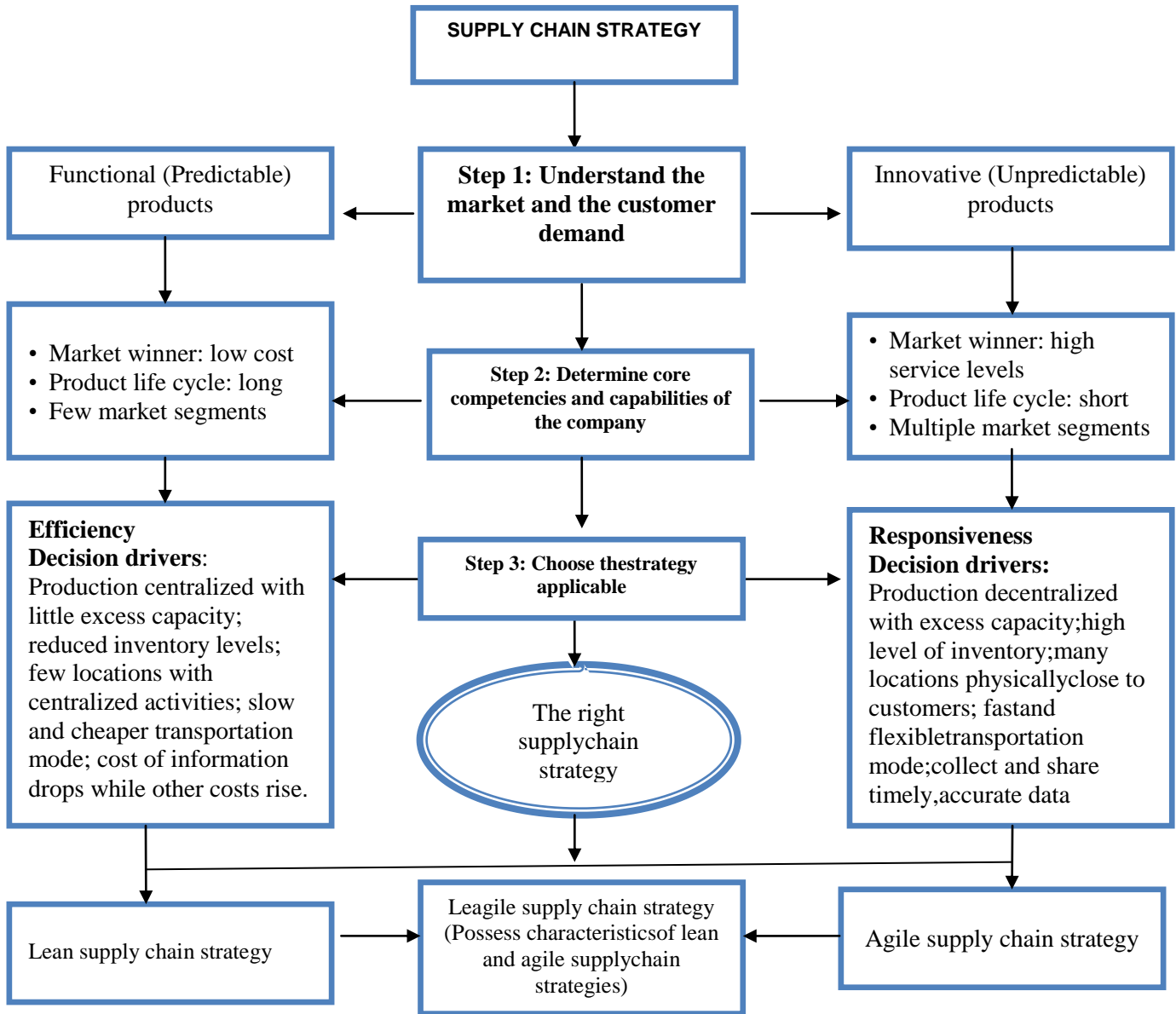
5.3 Recommendations

On the basis of the findings and conclusions reached, the following suggestions were forwarded in order to improve the Supply Chain Management of the case companies.

This survey study bring into being that there are mismatches between the chosen supply chain strategies and supply chain practices employed. Mismatches are the root cause of the problems plaguing many supply chains and therefore supply chain strategies that are based on a one-size-fits-all strategy will lead to failure. An effective supply chain strategy must be aligned with a company's business strategy since a mismatch generally leads to significant problems in business operations. It is therefore overbearing for supply chain managers of the paint firms located in Addis Ababa to understand their customers' needs and to choose and implement the right strategy for their supply chain to satisfy their customer needs. By implementing the optimal supply chain strategy, the paint manufacturing firms located in Addis Ababa could increase their competitive position in the industry domestically as well as in the global market.

An organization can employ an appropriate lean (efficient), an agile (responsive) or a combination of both, leagile supply chain strategies based on the product characteristics, manufacturing characteristics and decision drivers of SCM. The framework for choosing supply chain strategy adopted from different literature, as shown in figure 5.1 below, might help supply chain managers of these paint manufacturing firms to select correct supply chain strategy appropriate to their business firm.

Figure 5.1: Framework for choosing and implementing supply chain strategies



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Appendix I – Survey questionnaire

**ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT
POSTGRADUATE PROGRAM**

QUESTIONNAIRE

**ASSESSING THE SUPPLY CHAIN STRATEGIES OF PAINT MANUFACTURING FIRMS IN
ADDIS ABABA, ETHIOPIA**

Dear Respondent,

The main objective of the study is to assess whether Ethiopian paint manufacturing implement appropriate supply chain strategy in their current business circumstances. The study explore the supply chain strategies implemented in the paint manufacturing firms located in Addis Ababa in an attempt to better understand the industry and finding optimal supply chain strategies, thereby improving their competitiveness in the construction industry.

Your attitudes and opinions are critical to the success of this study. I recognize the value of your time, and sincerely appreciate your efforts. I assure you that your responses are anonymous and all your company level data will be held in confidence.

Thank you in advance.

NB:

- No need of writing your name.
- Please tick (✓) the option on how your company is addressing supply chain issues

SECTION A: RESPONDENTS' DEMOGRAPHIC INFORMATION

1. **Gender:** Male Female
2. **Age:**
 Below 30 31-40 41-50 51-60 61 and Above
3. **Educational Background**
 Elementary School High School College Diploma
 First Degree MA and Above
4. **Experience**
 Below 1 Year 1-5 years 6 – 10 years Above 10 Years

SECTION B: ALIGNMENT OF SUPPLY CHAIN WITH BUSINESS STRATEGY

Questions 1 and 2 related to the alignment of supply chain with business strategy in your organization.

1. This question explores how supply chain is viewed in your organization, please choose your view from the following options:

Supply chain is excluded from plans for meaningful change in our company perspective	<input type="checkbox"/>
Supply chain is considered as a standalone operating function within our company	<input type="checkbox"/>
Supply chain is considered as a source of business value and competitive advantage	<input type="checkbox"/>

2. Please indicate to what extent there is an alignment of supply chain with business strategy in your organization.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
There is an alignment of supply chain with business strategy in our company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SECTION C: ASSESSING IMPLEMENTED SUPPLY CHAIN STRATEGIES

Questions 1 to 4 relate to supply chain strategies implemented in your company. This questionnaire assesses the relationship between product, marketing, the decision drivers of the supply chain and the supply chain strategy.

C1: THE RELATIONSHIP BETWEEN PRODUCT CHARACTERISTICS AND SUPPLY CHAIN STRATEGIES

1. Indicate your level of agreement with the following statements on the characteristics of your company products:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The paint are standard products (no customization)					
The demand for the product (paint) is stable					
The market winner (most important sales criteria/point) for the products is cost					
The order lead time (order to delivery) takes longer time					
Our forecast for the products is relatively accurate					

C2: THE RELATIONSHIP BETWEEN THE MANUFACTURING CHARACTERISTICS AND SUPPLY CHAIN STRATEGIES

2. Please indicate your level of agreement regarding the following manufacturing characteristics of your company products.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
We have a low manufacturing cost strategy					
We make provision in our manufacturing strategy for customers' demands (specifications)					
We change our manufacturing strategy quickly according to customer demands					
We customize some parts in our production process to meet certain customer orders					
We keep minimum inventory in the production process					
We manufacture on the basis of projected forecast					
We have a pull system with specific customer orders					

3. Which of the following statements relating to postponement (decoupling point) are applicable to your company products?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Our strategic suppliers keep inventory in the form of modules, components and materials					
We keep fully finished products in stock					
Our dealers keep fully finished products in stock					
We keep work -in-progress inventory to be customized for specific customer orders					
We only order modules, components and materials from our strategic suppliers when the customer specifications are known					
We make provision for finalization of some features to our products at the dealership, based on final customer request					

C3: THE RELATIONSHIP BETWEEN DECISIONDRIVERS AND SUPPLY CHAIN STRATEGY

4. Please indicate the extent to which the following decision drivers of supply chain are applied in your company:

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Production	We have flexible manufacturing processes					
Inventory	We work on strict Just In Time (JIT) system and therefore keep inventory holding in the production process to a minimum					
Location	We have decentralized distribution centers (stores) to serve our dealers					
Transportation	We make small and frequent shipments to our strategic customers					
	We receive small and frequent shipments from our strategic suppliers					
Information	Information helps us to build master production schedule (forecasts) and create delivery dates					
	Information is used on actual demand to be transmitted quickly to reflect real demand accurately					
Supplier Selection	We select suppliers based on low price/cost					
	We select suppliers on the basis of high -quality standards					
	We select suppliers on the basis of dependability or sustainability					
	We select suppliers on the basis of flexibility					
Pricing Strategy	Our pricing strategy is determined by balancing supply and demand					
	Our pricing strategy is based on low margins (low margins based on high sales volume)					
	Our pricing strategy is based on differentiation in the market					

Thank you very much for giving your time!!!