ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

THE EFFECT OF SUPPLY CHAIN INTEGRATION ON OPERATIONAL PERFORMANCE (THE CASE OF MW PLASTIC PRODUCTS MANUFACTURING COMPANY IN SEBETA)

BY :

BEDILU MANDEFRO

JUNE, 2018
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Approved by Board ofExaminers

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AdvisorSignature Date

_____ _____ _____
Internal examiner Signature Date

_____ _____ _____

ExternalExaminer Signature Date

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Chairman of Signature Date
Graduate Committee

Declaration

I, Bedilu Mandefro Haile, announce that this research paper entitled “the effect of supply chain Integration on operational performance in the case of MW Plastic products Manufacturing Company in Sebeta” is my own and I dare tosay that it is my original research work that has not been produced by others in any other universities for anyother requirements in any form. To this end, I acknowledged all sources of information that Iused to produce the study appropriately and perfectly.

Student ResearcherSignature Date
Bedilu Mandefro_____

Letter of Certification

This to certify that Bedilu Mandefro has carried out his thesis work on the topic entitled “The Effect of supply chain integration on operational performance (the case of MW Plastic Products Manufacturing Company in sebeta” under my guidance and supervision. Accordingly, I hereby assure that his work is appropriate andstandard enough to be submitted for the award of Master of Arts in Logistics and Supply ChainManagement.

Research Advisor Signature Date

Busha Temesgen _____ _____

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ACRONYMS

CI- Customer Integration

II=Internal Integration

INFI=Information Integration

SI=Supplier Integration

MCI=Mean of Customer Integration

MII=Mean of Internal Integration

MINFI=Mean of information Integration

MSI=Mean of Supplier Integration

MWPPMC- MulukenWoinu Plastic Products Manufacturing Company

NPT- Network Perspective Theory

PAT- Principal Agent Theory

RBV- Resource Based View

SCI- Supply Chain Integration

SCM- Supply Chain Management

SI- Supply Integration

TCA- Transaction Cost Analysis

Abstract

Supply chain integration is a crucial approach to improve the different dimensions of operational performance. The focus of the study is to investigate the effects of supply chain integration on operational performance in MW Plastic Products Manufacturing Company in Sebeta. In order to give better performance to the company and services to the customer, integration as a process has many touch points with multiple functions within the company and these functions need to be integrated. In order to conduct the research, problems related to lack of alignment among departments, cross-functional management, Strategic partnership and sharing of production capacity, awareness about the strategic plans of the company and Joint decision making on the issues of procurement, inventory management, production, distribution,extended lead times ,quick ordering systems, the occurrence of missed sales due to out of stock generated by problem of demand forecasting and logjam delay related with use of Enterprise Resource Planning, storage space utilization, poor supplier involvement on the development of firm values, and stability of procurement with suppliers and with major customers.

An explanatory (causal) research design was employed with a sample of 176 employees through stratified sampling. A questionnaire was used as a research tool for collecting data. Baseline data were captured from some informants and from secondary data. The collected data was analyzed using both descriptive statistics (mean & standard deviation) and inferential statistics (correlation and linear regression). Regarding the correlation, it is possible to conclude that there is a strong and positive relationship among the four supply chain integration dimensions which this study was relied on. TheMain findings of the study showed that, there was better existence of integration along the supply chain as the mean values of internal integration,information integration, and customer integration were above the minimum requirement, which is 3 except supplier integration as its mean value was below the limit. Moreover, internal integration, customer integration, and information dimensions of supply chain integration has a positive and significant effect on operational performance of the enterprise in which supplier integration dimension had failed to signify the effect and needs to include other supply chain variables. And also, the study recommends proper internal integration, information integration, supplier integration and customer integration strategies in order to bring effective operational performance.

Keywords*: Customer integration, information integration, internal integration, operational Performance, supplier integration, supply chain integration*

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Supply chain management (SCM) is a new concept involving the integration of all the value – creating elements in the supply, manufacturing, and distribution processes, from raw material extraction, through the transformation process, to end user consumption(Basnet,2012).Supply chain integration is the strategic integration of both intra- and inter-organizational processes (Flynn, B. B., Huo, B. and Zhao, X. 2010) and measures the extent to which supply chain partners work collaboratively together to gain mutually beneficial outcomes (O'Leary-Kelly and Flores, 2002). The ultimate aim is to gain effective and efficient movements of products, services, information, cash and decisions through coordinated endeavors and exchange of information in the provision of maximum value to the customer at low cost without delay (Frohlich and Westbrook, 2001); (Wong, C. Y., Boon-it, S. and Wong, C.W.Y, 2011). Supply chain integration emphasizes about collaboration between different companies within the supply chain or supply chain members. There are various key processes that can be integrated across the supply chain and some of them are: customers relationship management, customer service management, and demand management, order fulfillment, manufacturing flow management, procurement and product development (Sillanpaa, 2010). An integrated supply chain framework is needed to tie the whole network together in order to reduce perennial supply chain challenges such as functional silos, poor transparency of knowledge and information and the inadequate formation of appropriate customer and supplier relationships (Storey, 2006).The horizon of supply chain integration is wide enough ranging from supplier integration to customer integration including central concept of internal integration (Flynn, et al., 2010).Most definitions of supply chain management explicitly recognize the existence of two flows through the chain; there is a flow of goods and an equally important flow of information (Fisher, M. L. 1997; Pagell, M. 2004). Supply chain integration must thus comprise both information and material,and cannot restrict itself to only one (Stock, 2000;Fisher,1997).

If properly worked on supply chain integration, it will increase market share and business performance(Didia&Nwokah, 2015).A tight relationship among the members of supply chain create a conducive environment for the free flow of information and better performance, proper

functioning with employees, having better infrastructure and systems can have a climate of innovation and free flow of ideas. Thus having such type of organization creates capability for delivering high quality of goods and services which in turn have best satisfied customers and, a desire to be part of a win-win relationship. Consequently, a variety of opportunities will be created in order to sustain long lasting supply chain profitability and market share but needs to be managed effectively (Andrew & Linda, 2013). Creating a higher degree of integration through maintaining a supply chain strategic alliance between the supply chain members and managers both across and inside organizational processes so that it will be able to attain efficient and effective flows of products, services, money, information, and decisions. There by results in high product quality(lower defect rate), high visibility, short lead time , small amount of inventory and high capacity utilization, as a result managing supply chain integration becomes the best approach for the challenges of rapid market change, change in technology and globalization (Dawei,2011).

In general, from the perspective of organizational ability, supply chain integration, as a key capability of firms for inner and outer coordination, has direct and indirect influence on a company's performance(Huo, B. F. 2012).Cradle, 2015stated that the effect of supply SCI on performance is direct and measurable.It has a paramount importance to improve customer service, enhance product quality, and reduce cost of operation, reduced inventories, higher faster response times on,fewer stock outs,and higher on time deliveries. Other benefits include increased market share, improved customer satisfaction, and increased customer retention.

MW plastic products manufacturing company on which the researcher wants to make a study is named after the owner Mr. Mulukenwoinu, was established in the year 2005 G.C in the capital Addis Ababa, Kara locality with in a rented factory buildings. In the year 2007 G.C the factory has moved to a newly built factory in Oromiya regional state Sebeta town which is about 15 kilometers far from the main market called Merkato in the capital Addis. Initially the factory started production using 1 Injection machine with two moulds throughpurchasing raw materials locally. Now, the number of machines and moulds exceeds 14 and 98, respectively through purchasing raw materials from both local and foreign market. There are distributorsof the company’s product in Addis and Sales agents in different towns of the country like Hawassa,Shire,Mekelle,Bahirdar,andJimma (MW Plastic Products Manufacturing Company Profile, 2017).

1.2. Statement of the problem

Lack of supply chain integration causes serious problems such as increased inventory cost, delayed procurement, lowered product quality and inaccurate product forecasts, which may jeopardize both a focal organization and all of its supply chain partners, by worsening customer satisfaction (Flynn et al., 2010; Wong et al., 2011).An absence of internal integration and heterogeneity of each team's aim may cause redundant work and waste resources, which undermine quality and cost performance (Pagell, M. 2004). As stated in Chilerhouse(2011)the breadth of supply chain integration significantly correlates with increased performance, yet in practice, the majority of supply chains are not well integrated. Current rigid supply chains seem to struggle with the dynamic of the environment. Frequent Changes of customer preferences and demand as well as dynamic political and economic conditions do pressurize companies to focus on integration. Otherwise companies may face reduced flexibility and lower competitive capabilities. A recent literature review paper (Fabbe. C and Jahre, 2008) on the other hand found that more supply chain integration does not always improve performance, and that more research and improved methodologies are needed. Frohlich and Westbrook (2001) found that the widest degree of arc integration (defined as extent of integration) with suppliers and customers has "the strongest association with performance improvement".

The pre assessment conducted at MW plastic manufacturing industry signifies that supply chain is not well integrated. Some of the indicators include problems of integration pertaining to lack of alignment among departments, cross-functional management, awareness about the strategic plans of the company and Joint decision making on the issues of procurement, inventory management, production , distribution ,extended lead times, the occurrence of missed sales due to out of stock generated by problem of demand forecasting and logjam delay related with use of Enterprise Resource Planning, storage space utilization problem, poor supplier involvement on the development of firm values, and stability of procurement with supplier.More importantly, the in depth review of literature indicates that there are no studies conducted on the effect of supply chain integration on the performance of plastic products manufacturing company in Ethiopia, other studies in other sectors conducted so far limited their scope on analysis, challenges and opportunities on supply chain integration. While some studies have focused on the review of relations with partners in the supply chain, others focus on managing a supply chain as a single system.Besides, the researcher believes that the research conducted so far on these areas is very

limited and is not fully articulated and described yetwith the difference that each of them studied the topic according to the specific dimension of issue. This research is therefore an attempt to fill the research gap on the effect of supply chain integration on performance, principally in case of MW plastic products manufacturing company.

1.3. Research questions

The main research question is:

1. What is the effect of supply chain integration on operational performance of MWPPMC?

Sub-Questions:

1. What is the impact of internal integration on operational performance of MWPPMC?
2. Does information integration affect operational performance of MWPPMC?
3. How does integration of customer influence operational performance of MWPPMC?
4. How does supplier integration affect operational performance of MWPPMC?

1.4. Objective of the study

1.4.1 General Objective:

The objective of this study was to assess the effect of supply chain integration on operational performance of MW plastic products manufacturing company.

1.4.2. Specific Objectives:

1. To examine the effect of internal integration on operational performance of MWPPMC.
2. To measure the impact of information integration on operational performance of MWPPMC
3. To analyze the effect of customer integration onoperationalperformance of MWPPMC
4. To evaluate the influence of supplier integration on operational performance of MWPPMC

1.5. Significance of the study

This study is crucial as it will help some important executive bodies (top manager, owner) to look at the subject matter seriously and take corrective action on the existing problems for all plastic products manufacturing industry, government to enact appropriate legislation in order to enhance proper supply chain integration. It will serve as a stepping-stone for further study. It means this study serves as a future reference for new researchers on the area. It also serves as a guideline for new entrant investor. This paper will try to link the gap between the theory and practices in relation to supply chain integration on operational performance. Besides, beneficiaries from the study will be the business people in the industry, they will use the findings to know how to

enhance their work and deal with the common challenges systematically. Finally,Based on recommendation, it helps to give training for all employees that help to develop their skill and knowledge, utilization of new and advance technologies and to provide other improvement on supply chain integration on performance of plastic products manufacturing company.

1.6. Scope of the Study

The areal coverage of the topic is mainly on the issues of internal integration, supplier integration, customer integration, information integration on supply chain performance, however didn't take in to account other performance measurements such as financial constraints –profitability and market constraints.The geographical scope of the study coveredSebeta town because the departments and the company covered under the study are found in the town. Taking only Sebeta town may not reflect the emotion of employees of plastic products manufacturing companiesin other places.

1.7. Limitation of the research

The research investigated the effect of supply chain integration only from the perspective of the focal firm employeesand ignores other supply chain members and it could be more realistic if the perspective of customers, suppliers, distributors and other third partieswould be included.

The research was limited in a sense that the results may not be specific as to what mighthave been obtained if descriptive or exploratory research methodologies were applied. Another limitation was on data gathering techniques employed by the researcher as questionnaire has no possibility of questioning the respondents as of in the case of interview. Sothe respondents may not clearly understand the idea of the questions and the researcher cannot exactly trace the real feelings of the respondents.

1.8. Organization of the study

This paper is aimed to assess and determine effect of supply chain integration on performance of MW plastic product manufacturing company in Ethiopia, and suggests future research directions.

The proposed study comprises five respective chapters in which the researcher clearly stated the entire processes of the study, this includes:

Chapter one: Introduction.

This chapter contains the background of the study, statement of the problem, basic research questions, objectives of the study, and definition of terms, significance of the study, limitation, and scope of the study.

Chapter Two: Review of Related Literature.

This part of the study deals with the literature (theory and Empirical evidences) relevant to the proposed study. The division of the chapter will be on the topic from previous studies.

Chapter Three: Research Methodology of the Study

In this chapter the researcher describes the type and design for the proposed research that is to be adapted from the previous studies, the subject/participant of the study, the sources of the data, the data collection instruments to be employed, the procedures of data collection and the method of data analysis.

Chapter Four: Results and discussion. These chapters summarized the results, and findings of the study, and also interpret or discuss the findings.

Chapter Five: Summary, Conclusions and Recommendations

It is a chapter that comprised three sections, which will include summary of findings, conclusion as well as hint for future research and recommendation

1.9. Definition of terms

- Supply Chain: Network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of ultimate consumer (Ivy wigmore, 2013).
- Supply Chain Management: the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purpose of improving the long term performance of the individual companies and the supply chain as a whole (Mentzer, 2001).
- Integration:Uniting, combining or incorporation of two or more functions within a company or two or more processes between two or more companies into a compatible or unified process in an operational sense" Keebler and Durstche (2000, p91.)
- Supply chain integration: extent to which all activities within an organization, and the activities of its suppliers, customers, and other supply chain members, are integrated together (Narasimhan, 1998).
- Internal integration: represents the integration of all internal functions from material management to sale and distribution (Baharanchi, 2011).

- Information integration: also called referential integration is the merging of information from heterogeneous sources with differing conceptual, contextual and typographical representation (Woods, 2016).
- Supplier integration: integration back down to the suppliers represents a change in attitudes from conflict to cooperation starting with product development, supply of high quality products, process and specification change information, technology exchange and design support (Baharanchi, 2011).
- Customer integration: the firm will penetrate deep into the customer organization to understand the product, culture, market and organization so that it can respond rapidly to the customer's needs and requirements (Baharanchi, 2011).
- Firm performance: Is the concept of how successful an organization is in achieving the outcomes the organization intends to produce (Field, 2004).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1. Theoretical Literature Review

This chapter reviewsrelatedtheoretical and empirical studies in detail to help the researcher develop a conceptual framework there by establishing a research gap through carefully scrutinizingtheeffect of supply chain integrationon operational performance.

2.1.1. The Concept of Supply Chain Management

Since its introduction in the early 1980s, supply chain management (SCM) has attracted a lot of attention in both business and academic circles. Recent years have seen a proliferation of literature with its origins in a range of academic disciplines and industry sectors. This has prompted scholars to classify the literature in various ways. For example, Tan (2001) illustrates the development of SCM from both purchasing and supply perspective, as well as a transportation and logistics perspective. However, one theme that is a characteristic of much of the scholarly work in the field is that of integration. In today's business world the central concept of supply chain management is covered by the idea of integration, as the practice of SCM demands a systematic integration processes starting from sourcing, to manufacturing, and to distribution along the supply chain (Cooper, Lisa, Ell ram, Gardner, and Albert,1997).Supply chain management can be articulated through different tools such as; reducing factors that increase the price of the product, increasing service promptness, fast delivery of goods that fulfill the need of the consumer, and acting as a force that drives the expectations and value to the customer. The influence of supply chain integration on customer value delivery has a strategic significance and the marketing provides the benefit that consumer's desire from a product while delivering these values and expectations. Customarily, supply chain is viewed in terms of problem of production and the timely delivery of products as needed. However, this view has paved a way to a multidimensional focus on developing a whole new way of undertaking business. The capacity of a given firm to provide customer's requirements depends, to a large extent, on the quality of its supply chain and logistics systems.Patterson (2007), recommends that: Supply chain capabilities are likely to play a large part in; reducing costs and thus impacting on price, determining the speed of availability of the product to the customer; influencing the degree of product customization possible; impacting on customer choices; capturing and sharing information with suppliers and customers, and negotiating initial aspects of the relationship with distributors and

key accounts. Since the objective of supply chain management is to "maximize value in the supply chain" and to allow a company to compete via improved efficiency and market effectiveness (Ambe, 2010). Supply chain management can be defined as "the design and management of seamless, value-added process across organizational boundaries to meet the real needs of the end customer" (Fawcett, 2007). It can also be expressed as the systematic, strategic coordination of the traditional business functions and the tactics across these businesses functions within a particular company and across businesses within the supply chain, for the purpose of improving the long term performance of the individual companies and the supply chain as a whole (Mentzer, 2001).Therefore, currently, Firms can no longer effectively compete in isolation of their suppliers and other entities in the supply chain. The competitive importance of linking a firm's supply chain strategy to its overall business strategy and some practical guidelines are offered for successful supply chain management (Rhonda, 1999).

2.1.2. Supply Chain Integration

Over the years, manufacturing firms have focused on developing strategies that would bring about the much desired level of change and operational performance in the organization. However, firms have realized that creating strategies along with integrating internal functions, suppliers and customers in a business relationship is the proper model for achieving competitive advantage (Frohlich&Westbrook, 2001). Bowersox, (2002) provides a very insightful explanation of how integration increases competitiveness via value creation: by expanding the scope of economies of scale to a wider setting, hence reducing waste and lowering costs; .by increasing market value, by providing the customer with convenient product assortment; and by increasing relevance value, by offering customized products tailored to customers' specific needs. Literature such as Pagell (2004) noted that the entire concept of supply chain management is really based on integration. The term "integration" refers to control a number of similar economic or industrial processes that were previously been controlled separately. Supply chain integration can be defined as:

"… the extent that a manufacturer has strategic partnerships with supply chain partners and processes within and outside the organization runs, aim to achieve effective and efficient flow of products, services, information, money that lead to decisions which provide maximum value to the customer with low cost and high speed." (Flynn et al, 2010).The extent of Supply chain integration depends on the extent in which a supply chain create a strategic alliance between the supply chain members and managers both across and inside organizational processes ,so that they can attain

efficient and effective flows of products, services, money, information, and decisions .Kwon and Suh (2005, p26) referred to supply chain integration as "a strategic tool, which attempts to minimize the operating costs and thereby enhancing values for the stakeholders (customers and shareholders) by linking all participating players throughout the system, from supplier's suppliers to the customers". The definition stresses that supply chain integration is related to close collaboration and working the different parties as a single entity.

The Integration of supply chain needs both the close synchronization of all daily operational and planning processes and the avoidance of departmental biases and the establishment of strategic congruence and consensus. The integration of physical distribution of product has gone long way to make it practical. The implication of supply chain integration is that companies can work together to properly manage intra and inter-organization processes and to strategically work together with its supply chain partners. The operation of Supply chain is highly significant that its prompt delivery enhances value offerings customers need for fulfillments and as such they dictate the place, the time and the mechanisms these goods are delivered to them and in what manner. Supply chain integration enhances these and leads to increase in market share and business performance (Didia&Nwokah, 2015).The integration activities can be dealt either through forward mechanism which is from a supplier to a buying firm or through backward system going from a customer to a buying firm (Cousins &Menguc, 2006). There are various key processes that can be integrated across the supply chain and some of them are: customers relationship management, customer service management, and demand management, order fulfillment, manufacturing flow management, procurement and product development (Sillanpaa, 2010).An increase in level of SC integration will provide rapid access to required source of information, more sensitivity toward the needs of customers and enabling faster response time creating a competitive edge among competitors. (Sezen, 2008).Lee (2000) suggested that well-integrated SCs create value for the shareholders by decreasing costs and increasing market share.

2.1.3. Theories of Supply Chain Management (SCM)

The base of this study was based on Halldorson(2007:287) four theories of supply chain management specifically; the principal-agent theory, transaction cost analysis theory, the network theory and the resource based view theory.

2.1.3.1. SCM Mitigating Agency Problems-The principal-agent theory (PAT)

The theory is based on the separation of ownership and control of economic activities between the agent and the principal. There are different agency problems that arise due to, difference in terms of information between the principal and the agent, conflicting objectives, differences in risk aversion, outcome uncertainty, behavior based on self-interest, and bounded rationality. The relationship between the principal and the agent is governed by the binding contract between the two parties, and the aim of the theory is to design a contract that can reduce potential agency problems. A contract that had the right mix of behavioral and outcome-based incentives which motivate the agent to act according to the interests of the principal is considered as the "most efficient contract". In supply chain management the issue of alignment of incentives is an important aspect. Mostly the concept of misalignment emanates from hidden actions or hidden information. However, in order to reduce misalignment it is substantial to create contracts with supply chain partners that balance rewards and penalties (Ensermu, 2015). Contracts are used as governance and control mechanisms whilst incentives are provided for meeting the minimum expected standards of the Principle.

2.1.3.2. SCM as Coordination of Transferred Rights of Disposals-Transaction cost analysis (TCA)

The analysis provides a normative economic approach which determines the boundaries of a firm and can be used to present efficiency as motives for entering interorganizational arrangements (Williamson, 1996). An organization may minimize its total transaction costs by cooperating with external partners. From SCM context, this question is addressed as: what are the activities that should be performed within the boundary of each firm, and what are the activities that should be outsourced? The relationships of SCM are represented by the hybrid mode of governance between markets and hierarchies. The most influential attribute of the transaction is asset specificity (Ensermu, 2015). Transaction costs can be influenced by behavioral assumptions of bounded rationality and the risk of exposure to opportunistic behavior from a partner. Bounded rationality may arise from lack of sufficient information, limits in management perception or limitation of capacity to process information. There are different Mechanisms to reduce the risk of opportunism which include safeguards and credible commitments such as long-term contracts, penalty clauses if a partner fails to fulfill the contract, equity sharing, and joint investments. According to

Williamson (1996), trust among parties should have to be based on "calculated risk" and not on simple personal trust between individuals.

In supply chains the analysis of transaction cost has been used widely in make-or-buy decisions. For instance, outsourcing of logistics activities (Halldorsson, 2002), buyer supplier relationships and restructuring of supply chains (Croom, 2001).In essence, TCA is a useful instrument to decide whether a transaction should be performed in the marketplace or in house.

2.1.3.3. SCM as Reciprocated Interactions between Institutions -Network perspective theory

The performance of an organization depends both on how efficiently it cooperates with its direct partners, and on how well these partners cooperate with their own business partners. The theory is used to provide a basis for the analysis of concepts of reciprocity in cooperative relationships (Croom, 2001). Here, the continuous interaction of an organization with other players becomes an important factor in the development of new resources and the interaction combine the resources of two organizations to achieve more advantages than through individual efforts. Such a combination can be viewed as a quasi-organization (Halldorsson, 2002). The value of a given resource is based on its combination with other resources, which is the basic reason for inter-organizational ties and makes more important than possessing resources. Thus, the structure of the supply chain is determined by the resource structure of an organization and becomes its motivating force. The basic contribution of network theory (NT) is to provide an understanding on the dynamics of inter-organizational relations by emphasizing the importance of "personal chemistry" between the parties, through building-up of trust based on positive long-term cooperative relations and the mutual adaptation of routines and systems through exchange processes. Through direct communication, the relationships convey a sense of uniqueness, ultimately resulting in supply chains as customization to meet individual customer requirements. The parties gradually build up mutual trust through the social exchange processes. A network does not need an optimal equilibrium; rather it is in a constant state of movement and change. Links between firms in a network develop through two separate, but closely linked, types of interaction: exchange processes (information, goods and services, and social processes) and adaptation processes (personal, technical, legal, logistics, and administrative elements) (Ensermu, 2015).

2.1.3.4. The resource based view (RBV)

Only a few studies used the resource-based view to the field in focus in order to get the sources of competitive advantage through SCM or to analyze the structure of chains and industrial clusters. The RBV concerns with competitive advantages obtained through the possession of heterogeneous resources (financial, physical, human, technological, organizational, and reputational) and capabilities (combination of two or more resources) by an organization. These resources and capabilities hold the core competence of an organization and serves as source of competitive advantage. The static stream of research focuses on attributes that contribute to the heterogeneity of resources and capabilities. The main barriers that may prevent competitors from imitating a firm's resources and capabilities include: durability, transparency, transferability and replicability. The more dynamic aspects of the RBV consider a firm's core competence to be its ability to react quickly to situational changes and build further competencies (Miller & Ross, 2003).

Hence, a firm's competitiveness is associated with the configuration of resources and capabilities as the markets evolve. However, inter-organizational relationships may also facilitate and advance the learning processes of individual firms. As such, relationships are not only output-oriented but also learning oriented. Efficiency may not only be explained in terms of productivity or operational measures, but also in terms of the opportunity to access another firm's core competencies through cooperative arrangements as an alternative to building such competencies in-house (Ensermu,2015).

The RBV is an implicit assumption in many supply chain decisions. Often, outsourcing decisions are based on the idea of focusing on core competencies and outsourcing complementary competencies to external partners. TPL and outsourcing of standard components and processes to subcontractors are examples. However, outsourcing of design, New Product Development(NPD), or software development is often a way to gain access to other supply members‟ core competencies through inter-organizational collaboration. The PAT stresses issues of inter-firm contracting and ultimately the notion of supply chain transparency. The TCA considers hybrids such as integrated supply chains as the result of a market failure, whereas the NT and the RBV see the supply chains as a means to access resources and competencies outside the focal firm (Skjoett-Larsen, 1999).

2.2. Empirical Review

2.2.1. The Dimensions and Levels of SCI

The horizon of supply chain integration is wide enough ranging from supplier integration to customer integration including central concept of internal integration (Flynn et.al, 2010).Narasimhan and Kim (2002) reviewed integration from the point of internal integration, supplier and customer. Sheu(2006) based on a study of the integration of suppliers in Taiwan defined a model that includes long-term relations, information architecture, performance, suppliers and retailers participation (Li & woo, 2004;Narasimhan et.al, 2002).

2.2.1.1. Internal Integration

Internal integration is the degree to which a manufacturer structures its own organizational strategies, practices and processes into collaborative,synchronized processes, in order to fulfill its customers' requirements (Baofeng,2014). Internal integration focuses on the joint activities and processes wit in a firm that coordinates functions related to procurement,manufacture, and market distribution.Many firms have attempted to integrate internal functionality (Bowesox, 2002)

Internal integration should emphasizes that different departments in an organization should act as an integrated process rather thanacting as functional silos(Afshan,2013) .Internal integration is sharing relevant business information and supportive internal services within a firm in order to create more efficient operations.It is identified as the result of a focus on collaboration of activities within a firm (Teixeira,2012).

Internal integration shows customer needs support at the lowest level of expenditures, internal integration,and integration of all internal operations, materials management, production, sale and distribution. Internal integration is described by the distribution and sale, and requires the integration of all functions controlled by the company in order to reach customer satisfaction. In other words, it has a particular attention to the connection of functional areas such as procurement and purchasing, production, logistics, marketing, sales and distribution. (Saee&Nakhaee, 2006)

An important study conducted by Pagell (2004) supply chain integration of manufacturing companies in USA, emphasized on internal integration and his findings indicate that internal integration is a complex phenomenon driven by a number of factor including the internal structures

and culture, reward systems and the amount of formal and informal communication across the functions.

Internal integration can help functions to leverage each other's resources and capabilities to jointly design products, ensure product quality and reduce duplicated tasks (Flynn et al., 2010; Schoenherr and Swink, 2012). For example, Tan (2001) found that internal integration could create a close link between manufacturing and distribution processes to deliver products and services in a timely and effective manner.

2.2.1.2. Information Integration

Supply chain information integration suggest two major aspects: the technical aspects (information technology connection), and the social aspects (information sharing and trust). Then we expressed information integration - information technology and information sharing - in supporting integration of material flow (logistics).

2.2.1.2.1. Information Technology (IT)

Over reliance on technology without willingness and trust to share the critical information pertaining to supply chain will not make the firms meaningfully connected; thus, failing to produce logistics integration. Only firms that are capable of building both the technical and social aspects of information integration will see the maximum benefits of logistics integration (Chae, Yen, and Sheu, 2005; Fawcett, Osterhaus, Magnan, Brau, and McCarter, 2007).

Information (and communication) technology plays a central role in supply chain management in the following aspects. First, IT allows firms to increase the volume and complexity of information which needs to be communicated with their trading partners. Second, IT allows firms to provide real-time supply chain information, including inventory level, delivery status, and production planning and scheduling which enables firms to manage and control its supply chain activities. Third, IT also facilitates the alignment of forecasting and scheduling of operations between firms and suppliers, allowing better inter-firms coordination. As such, the problems in coordinating supply chain activities which often are hindered by time and spatial distance can be reduced (Paulraj and Chen, 2007).

Vickrey (2003) explained that integrated information technology, is a key factor for supply chain integration. These technologies include electronic data exchange between organizations and within

organizations through material requirement planning systems. Elahi (2009 Provides a model for explaining the role of IT in supply chain management integration,sixth international conference of information technology and Communications management stated that information technology plays a vital role in the success or failure of the supply chain.When suppliers are scattered across the world, integration of activities within and outside the company become important. This requires an integrated information system, which leads to information-sharing.

2.2.1.2.2. Information Sharing

While the technological aspect of information integration is important, it is the frequency, the quantity and the quality of information that is shared that really matters. Information sharing means “supply chain companies‟ willingness to give accurate, timely, related and common information to each other in order to create harmony at all levels of the supply chain." Information sharing in organizations causes better decisions, capacity allocation, production and materials planning through increased transparency, demand, supply and inventory. Studies show that information sharing acts as a key component in achieving an integrated supply chain. Some results are as follow: Increase coordination, reduce uncertainty, expedite material flow, accelerate order fulfillment, reduced inventory costs, increase customer satisfaction by reliable and fast delivering, improve performance, increase operational effectiveness, reducing bullwhip effect and ..... (Koçoglu, 2011)

Green and Shaw expressed that an important strategy for managing integrated supply chain is information sharing between trading partners. One of the main benefits of information sharing is inventory reduction.Koçoglu (2011) suggested Information sharing significantly reduce supply chain costs, improve communication with partners, increase the flow of materials, fast delivery, order fulfillment, and ultimately improve customer satisfaction, improve coordination and facilitate access to the competitive position.

Create, maintain and improve relations between organizations aim at achieving business goals that organizations cannot achieve lonely. In supply chain configuration, inter organizational relationships is usually obtained through partnerships or buyer – seller relations. Supplier participation in the supply chain shows agreement between manufacturing organizations and their participants. This includes sharing essential information. (Cheng, 2011).Das (2006) when a buyer determines a time for supplier integration in relation to advancement plans, it means this decision will cause improvements in delivery times.

2.2.1.3. External integration

External integration comprises supplier and customer integration (Ragatz, 2002). A multitude of activities between a focal firm and suppliers underpin supplier integration, including information sharing and collaboration in planning and joint production development in dealing with inter-organizational boundaries (Ragatz, 2002).

External integration expands the integration domain to outside of the organization to include suppliers and customers. According to the literature on external integration, there are two major areas that have been thoroughly emphasized: customer integration, supplier integration.Frohlich and Westbrook (2001), studied supply chain integration, according to the dimensions of supplier and customer and investigated its effect on market performance. They found that wider scope of integration is positively associated with improved performance.Efficient external process integration allows manufacturers to speed up product delivery processes, improve production planning and reduce inventory obsolescence using accurate information about customer demands and preferences (Swink, 2007).Further, process integration with suppliers helps manufacturers reduce mistakes and enhance product quality through information sharing and joint planning, which are directly related to the manufacturers' operational performance (Petersen, 2005). Product integration with suppliers and customers can enhance manufacturers' new product development capabilities, promoting product quality, flexibility and innovation in addition to product competitive advantage (Koufteros, 2007; Swink and Song, 2007; Swink, 2007).

2.2.1.3.1. Customer Integration

Customer integration is defined as the collaborative involvement of customers with the buyer organization, strategically sharing information and knowledge about their needs and buyer

organization's product performance, such as quality, delivery time, and cost. Close and collaborative relationship with customers may be an important factor influencing supply chain performance, market performance, and innovation (Teixeira, 2012).Customer integration enhances market expectations and opportunities, leading to more precise and rapid responses to customer needs (Swink, 2007).

2.2.1.3.2. Supplier Integration

Supplier integration refers to the collaborative involvement of suppliers with the buyer organization, providing operational a well as strategic information and supporting activities, such as new product development process (Teixeira, 2012).

Because of its strategic nature, supplier integration can be characterized by the collaborative and long term relationship between buyer and supplier, involving high levels of trust, commitment and information sharing(Teixeira, 2012).

2.2.2. Benefits of SCI

Fawcett(2008) recognized thesubsequentas benefits of SCI. These are respond to customer request, on time delivery, higher customer satisfaction, short order fulfillment lead times, reduce cost of purchased items, enhance firm profitability, handle un expected challenges, reduce inventory costs, reduce overall product cost, improve productivity, enhance overall product quality, reduce transportation costs, create opportunity for market penetration, reduce product innovation lead times and lower costs of new product development.

2.2.3. Challenges and Obstacles of SCI

Supply chain is Meta structure (Meta system), characterized by a dynamic holarchy constituted of holons (business organizations) cooperating with each other. Business entities join in the supply chain by providing a diverse and unique ability or skill; this ability or skill is their characteristics. The more the supply chain expands the less consistent and intimate thecreated system becomes; consequently lack of integration occurs. This results in the internal links and relationships becoming less stable; the cooperation between the entities might be then hindered. The supply chain consists of permanent links, which constitute its core, and dynamically modified licks, for example, appropriate for a specific task. They are referred to as joining links. Following the completion of a given task, the joining links are separated from the core of the supply chain and

the co-operation is discontinued (Awasthi, 2014; Grzybowska 2010a, b). However, participatingina smooth- running supply chains is what is aspired by companies,thereforetoachieve this objective they must overcome certain obstacles.

Some of the most common obstacles include the need for globalization,the need to establish common interests,the need for an inter-organizational system(IOS),the need for multiple supply chains with in a company, and last, but far fromleast,the need for trust among participants(Crandall,2015).(Facett,2008) recognized:-inadequate informationsystems,lack of clear alliance guidelines,inconsistent operating goals,lack of shared risks and rewards, Processes poorly cost, Non-aligned measures,lack of willingness to share information,organizationalboundaries,in appropriate measures of SC contribution,in appropriate measures of customer demands.Lack of employee empowerment and lack of resources for SCM as barriers to effective supply chain integration.(Awad, 2010)on the other hand, also identified the following as Supply Chain integration Challenges at different levels of business environment such as Business Micro Environment, BusinessMacro Environment, and Technical Challenges

Business Micro Environment which includes::Transaction cost, Strategic flexibility management, Strategic planning management, Customer order management, Logistics management, Operational flexibility, Measures of supply chain benefits, Standard of trade, Procurement management, Enterprise integration.Business Macro EnvironmentcomprisesBusiness process integration, Culture and change, Supplier competence requirement, Business transformation oriented to globalization, Effect of globalization. Technical Challenges contains Data and information integration, Application integration, and extranet adoption

2.2.4. Drivers of Supply Chain Integration (SCI)

SCI has been found to improve performance of the supply chain. A study found that integrating with a firm's suppliers and customers along with the firm's competitive strategy will lead to improved operations performance (Zailani, &Rajagopal, 2005). (Won, Kwon, & Severance, 2007) Internal integration is the main strategy for cost reduction in the supply chain while supplier integration leads to better operational performance. Some performance measurements such as improved customer service, internal efficiency, demand flexibility, and product development (Hugos, 2011) are all indicators that firms try to improve and do so through SCI.Many firms seek to enter into new markets to boost their profitability. This has driven them to seek for better

strategic relationships to give them the platform for such marketing opportunity to a larger customer network. According to (Beheshti, Oghazi.Mostaghel, &Hultman, 2014) firms want to create value activities that would reduce their operational costs and boost profitability. This would require internal and external integration of their processes.

The environment in which businesses operate is characterized by quick changing market demands that require firms to enter into partnerships to be able to be responsive to such external factors (Glenn, Chen, Upreti, Fawcett, & Adams, 2009). Meeting the demand of the customers through marketing activities would still involve business processes integration to ensure goods availability (Hilletofth, P. 2011). International competition from other firms, entry to new markets, and international laws and regulations are other globalization factors driving supply chain integration among firms (Goeltz, 2014).

2.2.5. Facilitators of SC Integration

Identifying and understanding factors that facilitate supply chain integration is what a supply chain demands.In the words of Ellinger (2006), priority needs be given to a whole encompassing communication; coordination at the place of work, joint accountability, and senior management involvement, a comprehensive integration among internal operations which takes the right position in facilitating supply chain integration.Some of the other variables which enable -----external collaborative efforts include information sharing, communication, interdependency, and common goals and objectives

There exist different mechanisms in order to enhance the aspects of supply chain integration, for instance, to establish inter organizational teams, designing performance measures, and to create effective communication and information exchange. The establishment of effective alliances and collaboration along cross-company members aids in order to develop strong commitment and alliance that cannot be broken easily and immersed by traditional organization structures. Establishing strong commitment in strengthening relationships across company members provides an organization to become a forerunner in its business activity

(Moberg, 2003) recognized reduced cost of transportation and distribution, a coordinated planning, minimizing the level of inventories, better cycle times, and a prompted customer service, are the most significant outcomes of properly governed relational integration. The existence of effective and better communication open doors in order to design an integrated measurement development

and understanding. Enterprises which had a capability of creating a strong communication with their supply chain partners can develop standards that can enhance better decisions and strong performance (Frohlich and Westbrook, 2001). Generally, in order to facilitate the contribution of supply chain integration a critical improvement is needed on the factor that hinders better operational performance

2.2.6. Supply Chain Decision Making Areas

There are five areas where companies can make decisions that will define their supply chain capabilities. Companies in any supply chain must make decisions individually and collectively regarding their actions in five areas. These are:

1. Production—what products does the market want? How much of which products should be produced and when? This activity includes the creation of master production schedules that take into account plant capacities, workload balancing, quality control, and equipment maintenance.
2. Inventory—what inventory should be stocked at each stage in a supply chain? How much inventory should be held as raw materials, semi-finished, or finished goods? The primary purpose of inventory is to act as a buffer against uncertainty in the supply chain. However, holding inventory can be expensive, so what are the optimal inventory levels and reorder points?
3. Location—where should facilities for production and inventory storage be located? Where are the most cost efficient locations for production and for storage of inventory? Should existing facilities be used or new ones built? Once these decisions are made they determine the possible paths available for product to flow through for delivery to the final consumer.
4. Transportation—how should inventory be moved from one supply chain location to another? Air freight and truck delivery are generally fast and reliable but they are expensive. Shipping by sea or rail is much less expensive but usually involves longer transit times and more uncertainty. This uncertainty must be compensated for by stocking higher levels of inventory. When is it better to use which mode of transportation?
5. Information—how much data should be collected and how much information should be shared? Timely and accurate information holds the promise of better coordination and better decision making. With good information, people can make effective decisions about what to produce and how much, about where to locate inventory and how best to transport it.

Chopra and Meindl (2007:53-56) define these areas as performance drivers that can be managed to produce the capabilities needed for a given supply chain. They further classified these supply chain performance drivers in to two. These are: Logistical drivers and cross functional drivers.

i. Logistical Drivers-which include facilities, inventory and transportation.

a. Facilities- are the actual physical locations in the supply chain network where product is stored, assembled or fabricated.

b. Inventory- encompasses all raw materials, work in process and finished goods within a supply chain. Changing inventory policies can dramatically alter the supply chain's efficiency and responsiveness.

c. Transportation- entails moving inventory from point to point in the supply chain.

ii. Cross Functional Drivers- which include information on sourcing and pricing.

a. Information- consists of data and analysis concerning facilities, inventory, transportation, costs, prices, and customers throughout the supply chain.

b. Sourcing-is the choice of who will perform a particular supply chain activity such as production, storage, transportation or the management of information.

c. Pricing- determines how much a firm will charge for goods and services that it makes available in the supply chain.

Effective supply chain management calls first for an understanding of each driver and how it operates. Each driver has the ability to directly affect the supply chain and enable certain capabilities.

2.2.7. The effect of SCI on firm performance

It has long been recognized that traditionally managed businesses and supply chains, often characterized by high levels of fragmentation and have failed to achieve their true potential in terms of profitably meeting customer expectations. Supply chain integration (SCI) is, to a great extent, concerned with the development of more integrated approaches that hold out the prospect of eliminating many of the inefficiencies directly attributable to supply chain fragmentation.(Tan,2001). Increasing competition not only guides organizations to improve their internal operations (process control and inventory management) but also focuses on the integration of suppliers and customers in the entire processes of chain. Thus, suppliers‟ involvement in delivering value to customers causes competitive capabilities such as quality, delivery, flexibility and cost (Prajogo&Olhager, 2012).

Internal Integration through the use of cross-functional teams is commonly used by organizations interesting in achieving a better performance in terms of quality,innovation,and new product development.Internal integration reduces uncertainty by improving communication between departments. Cross-functional teams composed of specialized employees with different background and knowledge can share information and improve the decision making process.(Teixeira,2012). Customers play a prominent role in the performance of an organization. A close collaboration between manufacturers and customer helps in improving the accuracy of demand information which reduces manufacturers production planning and product design time and inventory obsolescence.Some of the benefits of integrating with customers are lower product development cost,higher quality with fewer defects,fewer engineering changes and shorter time to market and higher responsiveness (Afshan, 2013) Logistics integration decreases various problems such as bullwhip effect and gives the organizations and partners the opportunity to benefit from vertical integration (quality, reliability, planning and control and lower cost). Valizade&Malaki rad, (2011) Improved logistics integration between supply chain partners yields a number of operational benefits, including reduction in costs, lead time, and risks as well as improvement in sales, distribution, customer services, and service levels and customer satisfaction."(Stock et al, 1998) Firms with higher internal integration demonstrated higher relative logistics performance compared with less integrated firms. There is no difference between 'high' and 'low' integration firms on basic service. Harrison (2008);Prajogo&Olhager (2012) wrote improving the logisticsintegration is an important factor for achieving operational benefits such as reduced costs, delays, hazards, improved sales, distribution, customer service, service levels and customer satisfaction. Fox(1993) The Integrated Supply Chain Management System argued logistics is responsible for coordinating companies, suppliers, and distribution centers in order to achieve all possible outcomes and supply chain goals, including timely delivery, and minimizing costs ... logistics includes the flow of materials and goods from the supplier of raw material to consumer of finished goods.

Both research and practice have identified the coordination and integration of activities across the supply chain as key strategies to improve firm performance and to achieve and sustain competitive advantage. Firms with greatest extent of upstream and downstream supply chain integration would have higher levels of performance (Mackelprang, 2014)& (Flynn et al, (2010). Flynn B.et al, (2010)explained external integration as positively associated with operational performance.

Tait(1998) suggested organizations that regard relation with supplier as a priority, are attracting better financial performance and more customer satisfaction

Advantages of integration have been demonstrated via its impact on performance. Gimenez and Ventura (2003) showed a positive correlation between external integration and performance in a survey of large Spanish grocery manufacturers; a conclusion that was also reached by Frolich and Westbrook's (2001) international survey of fabricated metal products, machinery and equipment manufacturers In the words of Bagchi(2005, p. 275) "The conventional wisdom in most SCM literature is that the more integration – the better the performance of the supply chain". Whether it is integration with customers or with suppliers, the majority of the existing studies have found a positive relationship between supply chain integration and performance.

Frohlich and Westbrook (2001) found that the widest degree of arc integration (defined as extent of integration) with suppliers and customers has "the strongest association with performance improvement". Schoenherr and Swink (2012) conducted a new research on supply chain integration of various industries located in North America, Asia-pacific and Europe, the study emphasized on internal integration, supplier integration and customer integration and their findings indicated that internal integration supported external integration and also both supplier and customer integration are important for improved supply chain integration. Devaraj(2007) have concluded that information technology affects information integration and production in supply chain and Supplier integration has a positive impact on organizational performance. Frohlich and Westbrook (2001) found much wider range of integration; the relationship is stronger with improved performance. Sheu(2006) concluded that the higher participation levels leads to operational efficiency in the supply chain system. Li (2009) stated supply chain integration is significantly associated with supply chain performance. A research conducted by Ali (2010) emphasizes to identify the relationship between supply chain process integration and firm performance and their findings are all the three (physical flow integration, financial flow integration and information flow integration) of supply chain process integration were statistically significant for firm performance, but information flow integration shows a greater influence than physical and financial flow integration. However, a recent literature review paper (Fabbe, C. and Jahre, 2008) found that more supply chain integration does not always improve performance, and that more research and improved methodologies are needed

Performance is defined as the act of performing; of doing some things; using knowledge as distinguished from merely possessing it, and any recognized achievement (Oxford Advanced Learners Dictionary, 2000). Business performance is considered as a combination of management and analytic processes which allows managers of an organization to achieve predetermined goals. The management of business performance views business in a holistic way that goes beyond each division and areas that this business possesses. It is a construct that helps to determine the appropriate functioning and status of an organization. The measurement of business performance needs a multidimensional scale because it involves multidiscipline and cross functional aspects of the organization. The dependent variable of this study is operational performance which is predicted based on total integrated activities of the business. Accordingly, performance measurement of a business is described as, a process of proper functioning of organizational processes and applications designed to optimize the execution of business strategy (Nwokah&Maclayton, 2006).Performance measurement is integral in evaluation of any system. It is very important as a strategic tool and also provides means to achieve the objectives required, fulfilling a firm's mission/strategy statement(e.g., Schoenherr&Swink, 2012) (e.g., Flynn et al., 2010) or in separation (e.g., International Journal of Managing Value).There are scholarly opinions in the evaluation of business performance. Nwokah (2006) suggests that, business performance is related to the fulfillment of financial and operational business goals which helps to determine the status of an organization when compared to its competitors. There are many indicators used to understand the performance status of a firm. Business achievements or attributes are considered as strong financial result, satisfied customers and motivated employees, high levels of individual initiative, high level of productivity and the degree of innovation, aligned performance measurement and reward systems. (e.g., Schoenherr&Swink, 2012) either in aggregation (e.g., Flynn et al., 2010) or in separation (e.g., International Journal of Managing Value) In order for the supply chain to efficiently measure the overall performance, it has to distinguish itself from other performance measurement models by including suppliers, distributors etc. thereby making it multiple enterprises multiple measures type model.Various metrics have been considered to measure supply chain performance in the literature. Supply chain performance can be measured in varied dimensions like cost, quality, delivery, flexibility and reliability etc. (e.g., Schoenherr&Swink, 2012) either in aggregation (e.g., Flynn et al., 2010) or in separation (e.g., International Journal of Managing Value).While financial performance measures are more likely to reflect the assessment of a firm by factors outside of the firm’s boundaries, operational measures

reflect more directly to the efficiency and effectiveness of the operations within the firm. These categories of performance reflect competencies in specific areas of supply chain including cost, quality, and flexibility. They also mirror the two arguably most important dimensions of supply chain performance: efficiency, the ability to provide a service at a lowest possible cost, and customer service, the ability to accommodate customers‟ special requests (Fawcett & Clinton, 1996). Operational performance measures provide a relatively direct indication of the efforts of the various supply chain constructs. Therefore, in this study, we will adopt operational performance dimensions to measure the benefits of SCI .Some of the indicators of operational performance will be discussed below:

2.2.7.1. Cost

There are many indexes for improving operational performance of an organization one of the basic is reduction of its cost. The basic reason behind is to minimize the cost for the purpose of efficiency and effectiveness of strategies and policies.Proper cost management implies the optimal use of resources for the efficiency of organization in order to create value for customers. Due to this rationale the satisfaction of customer's and loyalty and long lasting wealth for the organization will be created. Effective way of managing cost is the result of managing decisions (Patterson & Anders, 2013).

2.2.7.2. Flexibility

Flexibility is expressed through the capability of a system to undertake proactive and reactive adaptation of settings to deal with uncertainties which occur both internally and externally uncertainty. In the supply chain the main reason for flexibility is to increase the complexity of processes that adds value and to shorten the time of response to the demand of the customer. Into days business world the complexity of business process is rising, so businesses must be customer oriented. Companies can take different measures to improve their products and increase their flexibility and one of the measures is to outsource some of their products to other companies (Singh &Sharma, 2014). Flexibility is described as the ability of a system of an organization in responding quickly to changes occurred both inside and outside the system. The final achievement in the performance of an organization is to gain competitive advantage and creating customers satisfaction.

2.2.7.3. Quality

Quality is highly related with the extent of communication among members of the supply chain. At this point quality of communication is expressed based on the degree of accuracy, adequacy, level of update, and completeness in the process of communication among partners of supply chain. Quality of communication is inferred based on the system of information; outsourcing and other related organizational relationships are considered as key variables in the relationship along partners of supply chain. In order to establish and maintain effective cooperation, the company should strive to create a meaningful and high-level communication with supply chain partners to enhance the quality and involvement along the supply chain.

Quality of communications plays a pivotal role in integrating activities related to organizational system in which quality of effective communications aids to integrate sustainable supply chain. The ultimate point is that, there is an acceptable relationship between quality of communication and supply chain integration in which the effect may be direct and indirect (Lin, 2013) (Patterson & Anders, 2013).

2.2.8. Conceptual Frame work

Supply chain integration (SCI) helps firms to reconfigure their resources and capabilities internally and externally to consolidate their supply chain as a whole in an effort to improve long-term performance (Horvath, 2001). SCI has both operational and financial performance benefits.A conceptual framework is created based on developing four major constructs derived from the theory development of supply chain integration. In the model below to show the effect of independent variables(Internal integration, Information integration, Customer integration and Supplier integration)on performance(cost, quality, flexibility, responsiveness, and delivery time)was used both at internal and external company levels.

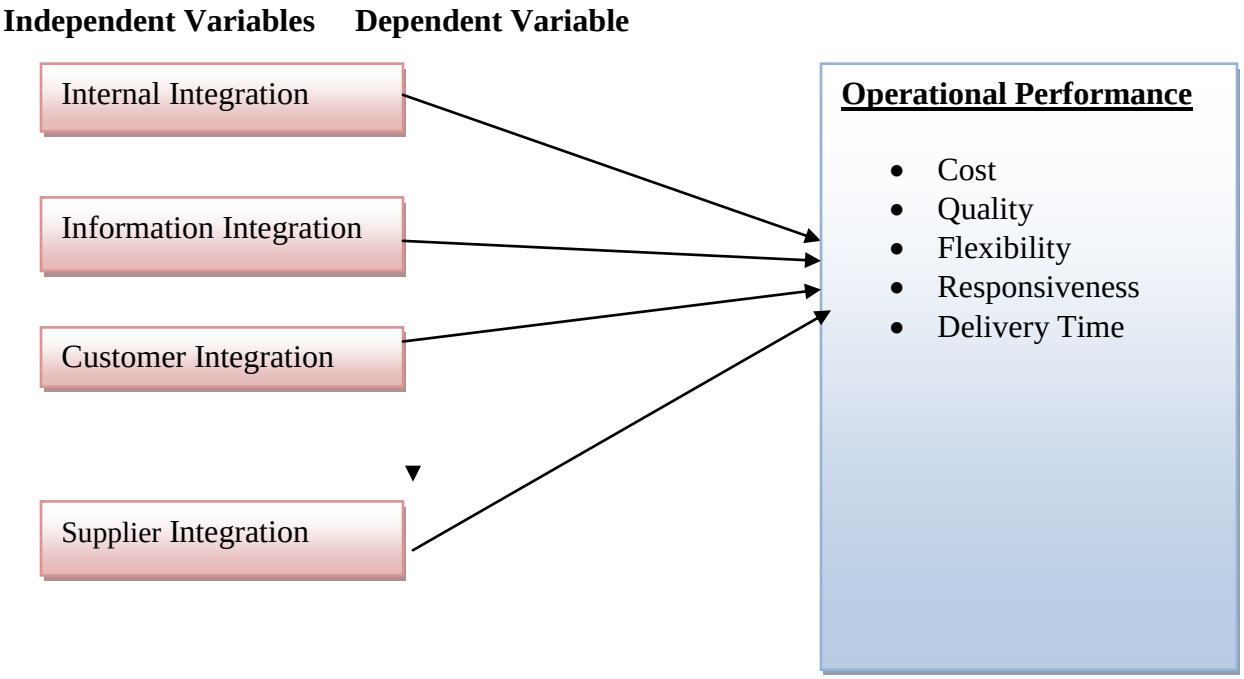

Fig 1.Conceptual frame work adapted fromVikas(2017),Evans &Mose(2013.) and Dr.Ali(2013)

2.2.9. Hypothesis

Based on the assumed causal relationship given in the conceptual model the following hypotheses were developed for testing.

Ho1. Internal integration has a significant influence on the operational performance of the firm.

Ho2.Information integration has a significant influence on the operational performance of the firm.

Ho3. Customer integration has a significant influence on the operational performance of the firm.

Ho4. Supplier integration has a significant influence on the operational performance of the firm.

2.2.10.Literature Gap

Studies that have been conductedto determine the effect and relationship between supply chain integration and operational performance used secondary data from already published journals and the researcher believes that the research conducted so far on these areas is very limited and is not fully articulated and described yet with the difference that each of them studied the topic according to the specific dimension of issue in order to analyze the data. But, this study depends on primary data which allows the researcher to get firsthand information on current business environmental activities and see the effect of supply chain integration on a number of dimensions. This research is therefore an attempt to fill the research gap on the effect of supply chain integration on operational performance.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter explored the research methodology used in carrying out the research study by describing the research process, research design, population and sampling, data collection approaches and instrument, and finally data analysis. Selection of research methods depends on the research objectives, nature of the subject and implementing facilities. The purpose of selection of research methodology is to identify an approach to find out the answer to the research questions more exactly and easily.

3.1. Research Design and Approach

A combination of qualitative and quantitative approach was used to provide an answer for the problem studied in order to decrease the limitation and increase the quality and flexibility of the data (Robinson, 1998).Among the different types of business researches this study used the causal research design. Causal research also termed as explanatory research is the investigation of cause and effect relationships in order to determine causality; to see variation in the variable that is expected to cause the change in the other variable and then measure the changes in the other variable using statistical methods. It allows us to understand the very nature of what we are actually looking at it.

3.2. Population and Sample Design

A representative sample for questionnaire was selected from the employees of the firm based on probability sampling techniques called stratified sampling on random sampling base.It was employed based on the strata of the departments and random table. The reason for using stratified sampling is that first, we can have more precise information inside the sub-population about the variables we studied. And second, we can raise precision of the estimate of the variables of the whole population.

This study applied Taro Yamane's (1973) simplified formula to determine the required sample size at 95% confidence level, and allowable error = 0.05% and number of employees are professional who work within the lines of supply chain of the company are 315.

$$n = \frac{N}{1+N(e)^2}$$

Where **'n'** is the sample size, **N** is the total number of employees in the factory, and **'e'** is the level of precision.

Substitute numbers in formula:

$$n = \frac{315}{1+315(0.05)\ 2}$$

n=176

After calculating the sample size by substituting the numbers into the Yamane formula, the numbers of sample is 176.

Table 1.Sample size proportion in each department.

No	Name of departments	No of employee's	Sample size proportion
1	Facility and Logistics	18	$\frac{21*176}{315} = 10.05\sim10$
2	Ware house , Quality Operation and others (IT ,Administration , HRM, Finance and Research and Development)	124	$\frac{124*176}{315} = 69.28\sim69$
3	Production	157	$\frac{158*176}{315} = 87.72\sim88$
4	Market Operation	16	$\frac{16*176}{315} = 8.94\sim9$
	Total Population	**315**	**176**

Source: Own survey result, 2018

According to the above formula given above, 176 employees became a representative samples for the study. This study considered permanent employees of the company which are selected using simple random sampling.

3.3.Source of data and data collection method

To undertake the study both primary and secondary data were used. Primary data was collected through questionnaires from selected sample respondents. Secondary data related to the subject matter was collected from journal, books, and various published and unpublished sources. Besides, for the sake of developing conceptual frame work the researcher used secondary data sources. These secondary data was obtained from published databases related to the study. To facilitate the study and gather relevant information, a customized standard questionnaire was prepared in accordance with supply chain integration and performance and distributed for all the

employees under study and collected by the researcher.Nachmias and Nachmias (2008) argues that questionnaires are more efficient in that, they require less time to prepare; they are less expensive and permits collection of data from a wide population.

5 point Likertscale was used to assess the respondents' degree of consent on effect of integration dimensions such as internal, customer, supplier, and information integration on firm's performance.

3.4. Research variables

Dependent variables: •Operational performance

Independent variables: •Internal integration •Information integration.

Customer integration •Supplier integration

3.5. Description of variables and measurements

Internal integration: is measured through data integration among internal functions, periodic interdepartmental meetings among internal functions, use of cross functional teams and integrative inventory management (Narasimhan& Kim, 2002).

Information integration: is measured through the level of sharing of accurate information across members of supply chain, the timely sharing of information across supply chain, coordination in the flow of information among partners and level of utilization of information among supply chain partners (Investopedia, 2016).

Customer integration: is measured through follow-up with customer for feedback, level of computerization for customer ordering, frequency of periodic contact with customer and level of linkage with customer through information network (Narasimhan& Kim, 2002; Morash& Clinton, 1998).

Supplier integration: is measured through the level of information exchange with suppliers through internet, establishment of quick ordering system with major supplier, level of strategic partnership with major supplier and stable procurement through network with major supplier (Narasimhan& Kim, 2002; Morash& Clinton, 1998).

Operational performance: is measured through the speed of response by the company to changes in market demand, on time delivery of products by the company to customer, the level of customer

service by the company and level of lead time for fulfilling customer order (Frohlich& Westbrook, 2001; Beamon, 1999; Vickey, 2003).

3.6. Data analysis and the statistics used

The data of this study was analyzed using computer through package software (SPSS: Statistical Package for Social Sciences .v21). Some statistical methods employed were:

- ✓ In this research data was analyzed using computer through software package called SPSS (Statistical Package for Social Sciences), version 21. The following are some statistical methods the researcher employed while conducting this research.
- ✓ The demographic background information of the respondents was analyzed and presented using descriptive statistics in form of frequency and percentage.
- ✓ To assess the practice of supply chain integration, measures of central tendency such as mean and standard deviation was used.
- ✓ Pearson correlation and simple linear regression were used to determine the relationship between supply chain dimensions and firm performance and test research questions to analyze the effect of supply chain integration on firm's performance from 4 dimensions of integration.
- ✓ The scoring of questionnaire was analyzed using five-pointLikertscale.

3.7. Reliability and Validity Test

Reliability

According to Golafshani (2003) reliability is defined as the extent to which results of a study are consistent over time and there is an accurate representation of the total population under study. Toke,(2012) said that the aim of reliability analysis is to find the extent to which a measurement procedure produced the same result if the process is repeated over and over again under the same conditions. The Chronbach Alpha statistics the most pressing techniques used in the literature to assess the scale's reliability and stability. Chronbach Alpha should be over 0.70 to produce a reliable scale and any scale with Chronbach Alpha less than this standard should be eliminated Sekaran (2005). To ensure the measurement and assessment of the real situation in the MW plastic products manufacturing, the researcher conducted survey on the questionnaire by taking 10 employees. The researcher did this by himself. Having the respondents comment and suggestion, the researcher made all the necessary improvements (adjustments) on both questionnaires mechanically as well as content wise.

Reliability Statistics :Dependent variable

Cronbach's Alpha	N of Items
.846	5

Reliability Statistic: Independent variables

Cronbach's Alpha	N of Items
.782	20

Validity

As per Mugenda(1999) for a research tool to be valid it needs to have three components, the first one is construct validity which deals with the consistency of the questions with the responses intended by the researcher. Structuring the questionnaire as per the specific objectives will assure this components of validity .Content validity is the second component which means the ability of an instrument to gather the data required for the analytical techniques suggested (Peil, 1996).Using close ended question will assure avoidance of irrelevant answer. To ensure internal validity of the questionnaire, the researcher gave the draft questionnaire to the supervisors for review and recommendations which are to be made portion of the final questionnaire. Internal validity is assured by rearranging the questions according to the comments to be given by the respondents in order to keep the flow of questions

3.8. Ethical consideration

To safe guard confidentiality names of respondents or other identifiers were not recorded .The respondents were informed and asked about their willingness and consent to cooperate while the data collection process carrying out. In addition to this, any information composed via the instrument would never be adopted for any other purpose other than its educational intent which means the data would be kept confidential. The respondents were informed to know before it is revealed and will be provided a copy of the publication.

CHAPTER FOUR

RESULTS, INTERPRETATION AND DISCUSSION

4.1. Introduction

Under this chapter the analysis and interpretation were carried out based on the data collected through questionnaire from four departments (i.e. Facility and Logistics,ware house and Quality Operation, production and Marketing operation) which work along the line of supply chain..Based on the methodologies, research design and tools of the proposal, the data was analyzed. The data was meant to collect from 176 respondents. However, only 167 of them returned the questionnaires. Therefore, 167 were effectivelyused for analysis that shows a response rate around 95 percent. This is a good response rate based on Fowler (2002), 75 percent response rate is considered adequate.

Data analysis, discussion and interpretation of the results are presented in the followingsubheadings: presentation of demographic data and frequency of respondents, analysis of mean, analysis of correlation and analysis of simple linear regression.

4.2. Demographic data presentation and analysis

Observing the demographic trend or characteristics of our sample population before starting the data analysis is useful to make the analysis more meaningful for the reader. This part of the questionnaire requested limited amount of information related to personal and demographic status of respondents.

The purpose of demographic analysis in this research is to describe the characteristics of the sample such as proportion of male and female in the sample, department of respondents, academic qualification of respondents and experience of respondents. Accordingly these variables are summarized and described in tables shown below.

Table 2. Demographic profile of respondents

Variable	Frequency	Percent
Gender of respondents : Male	107	64.1
Female	60	35.9
Total	167	100
Department:		
Facility & Logistics	10	6
Ware house and quality operations	68	40.7
Production	81	48.5
Market Operation	8	4.8
Total	167	100
Academic Qualification:		
Certificate	73	43.7
Diploma	46	27.5
First Degree	41	24.6
Masters degree	7	4.2
Total	167	100
Experience of respondents :		
< 1 year	7	4.2
1-5 years	67	40.1
6-10 years	68	40.7
>10years	25	15
Total	167	100

Source: Own survey result, 2018

As the above table depicts that the gender distribution of respondents in MWPPMC covers 64 percent of male and 35.9 percent of female, respectively. This implies that the gender distribution MWPPMC is dominated by male employees.

The respondents were also asked to indicate the departments they had assigned while they are in MWPPMC and the result implied that, the department of production counts 48.5 percent and ware house and quality operation covers 40.7percent, respectively. And also the department of market operations and facility and logistics take same 10.8 percent.Accordingly, the dep't of warehouse operation and quality Operations together withproduction departments accommodate about 89 percent of the total employees in the supply chain.

Concomitantly, the results of respondents associated with their educational background show that, 43.7percent of the respondents have certificate, 27.5 percent of the respondents have Diploma, 24.6 percent are first degree holders and 4.2 percent have Masters Degree.This indicates that more than 50 percent of the total population have diploma and above which paves them a way to adopt a better supply chain practice in the company by providing relevant and accurate information needed for the study.

Ultimately, the output in Table 1.shows that, 40.1 percent of the respondents indicated that they had work experience of 1 to 5 years while 40.7 percent of the respondents said that they have a work experience of 6-10 years. Besides,15 percent of the respondents have a work experience of > 10 years. The results indicates > 55 percent of the total population have a work experience more than 6 years so that they can understand the effect of supply chain integration on their operational performance so the researcher believe that most of them understand and provide informationwhat the questionnaire required to complete. The respondents experience helped them aware of the modern application and implication of supply chain procedures at the company level and therefore they gave the correct and accurate information the researcher needed for the study.

4.3. Descriptive Analysis

The mean or average is a measure of central tendency that offers a general picture of the data without unnecessarily covering one with each of the observations in the data set. The mean of respondents in each dimensions of supply chain integration suggest that the average amount that each dimension has positive or negative response of respondents. In this case, the mean of each item together with their respective dimension overall mean/average mean was calculated in order to conclude the overall supply chain integration of MWPPMC. The mean statistical values of the

items were based on the 5 point likert scale and will be illustrated through the following assumptions: if the mean (M) score is below 3 it implies that the respondents‟ disagree with the statement, if the mean score is equal to 3 it indicates that the respondents‟ prefer to stay Neutral, and finally if the mean score is above 3 it implies that the respondents" agree with the statement.Accordingly, the mean scores have been computed for all the four supply chain integration dimensions that includes supplier integration, information integration, customer integration, internal integration and also the dependent variable operational performance by equally weighting the mean scores of all the items under each dimension. The average means result of each supply chain integration dimension together with their respective variables was separately presented, analyzed and interpreted as follows.

4.3.1. Internal Integration

Table 3depicts the average mean value with regard to the use of cross functional teams in process improvement scored (M=2.72,SD=.962 which is the least of all the other internal integration dimensions. Followed by the level of integrative inventory management with a mean value of (M=3.16, SD=.996) respectively.The results indicated that the internal integration of the firm within the department and across other departments requires better improvement.This is consistent with the theory of integration which suggests that there is a need for integration amongst the functional departments in order to enhance the operational performance of the firm because; the proper functioning of internal activities had a great contribution in the enhancement of the performance.(Pagell, 2004; Chen, 2007; Kocoglu, 2011; Basnet and Wisner, 2012).

Table3. Mean value of Internal Integration

Items	Mean	Std.Deviation
Ensuring data integration among internal functions	4.17	1.141
Enterprise application integration among internal functions	3.84	1.037
The level of utilization of periodic interdepartmental meetings among internal functions	3.45	1.250
The use of cross functional teams in process improvement	2.72	.962
Integrative inventory management	3.16	.996
Average mean value	3.46	

N=167

4.3.2. Information Integration

Information integration is another core dimension of supply chain integration. The following table 4 pinpoints the mean value of each item related to information integration with its aggregate average.

The respondents are under complain due to there is strong utilization of information among supply chain partners with a mean and standard deviation score of (M=2.11, SD=0.864) respectively.

The effect of information integration is reflected in poor utilization of information among supply chain partners. However, Koçoglu(2011) states that, sharing of information across the chain is a key and critical component in achieving an integrated supply chain because it is believed that SCI increases collaboration, minimizes uncertainty, increases the speed of material flow, accelerate order fulfillment, reduction of inventory costs, increases the satisfaction of customer through reliable and fast delivery of products. The other problem that arises due to poor integration of information is a fragmented coordination on the flow of information which results for ineffective utilization of information. So, from the outputs we can easily infer that there is a poor utilization and coordination of information in MWPPMC.

Table 4.Mean value of Information integration

Items	Mean	Std.Deviation
Timely sharing of information across the members of supply chain	3.53	.849
Strong coordination in the flow of information among partners	3.39	.924
There is strong utilization of information among supply chain partners	2.11	.864
The firm informs trading partners in advance of changing needs.	3.16	.996
The firm partners share proprietary information with us.	3.31	.955
Average mean value	3.10	

N=167

4.3.3. Customer Integration

The other critical dimension of supply chain integration is the integration of customer. The table below depicts that there is better customer integration withthe mean of > 3.00. Finally, the respondents expressed their disagreement on the establishment of quick ordering systems with customer mean score of (M=2.98, SD=1.001) respectively.

Customer integration significantly influences the operational performance which aligns with the finding of Christina (2011) and Devaraj(2007). With a low level of customer integration, a focal firm is more likely to receive inaccurate or distort supply and demand information, which results in high level of inventory and poor delivery reliability (Lee, 1997).

Table 5.Mean value of Customer integration

Items	Mean	Std.Deviation
The level of linkage with your customer through information networks	3.16	.996
The level of computerization for ease of customer ordering	3.53	.849
The level of communication with major customers	3.39	.924
The establishment of quick ordering systems with your major customers	2.98	1.003
The level of sharing of available inventory with the	3.20	.983
The level of sharing of market information from major customer	3.07	1.001
Average Mean value	3.87	

N= 167

4.3.4. Supplier integration

Table 3, illustrates responses to the first item of supplier integration which shows the respondents disagreement about the level of strategic partnership with supplier and the level at which your supplier share their production capacity.These items have a mean and standard deviation score of (M=2.11, SD=0.864) and (M=2.78, SD= .939) respectively.

In the supplier-facing component of integration, a number of studies have found a positive association between supplier integration and operational performance (e.g., Petersen et al. 2005; Devaraj et al. 2007).

As the results acquired from MWPPMC indicated that, there is no strong integration with the level of strategic partnershipand the level at which your supplier share their production capacity which in turn affects the operational performance of the firm. In today's business environment, companies are expected to perform in collaboration rather than competition where the integration among businesses plays a central role. Moreover, the results obtained depict that Supplier integration has a significant influence on operational performance of the enterprise which aligns with the finding of Ragatz et al. (1997)Rosenzweig, 2003; Devara, 2007; Zhao *et al*., 2011).

Table 6.Mean value of Supplier integration

Items	**Mean**	**Std.Deviation**
The level of information exchange with your major supplier through information networks is high	3.43	.868
The level at which your supplier share their production capacity with you	2.78	.939
The level at which your supplier share their production schedule with you	3.08	1.064
Sharing your production plan with your supplier	3.02	.782
The level of strategic partnership with your supplier	2.11	.864
Average mean value	**2.884**	

N=167

4.3.5 .Operational Performance

As per table 7 from the dimensions of operational performance we can conclude that the majority of the respondents agreed that the firm upgrade products to meet major customer's requirement, introducing new product in the market, quickly respond to changes in market demand, has an outstanding on-time delivery record to its customer, and provided a high level of customer service to its major customer.

Table7.Mean value of Operational performance

Items	Mean	Std.Deviation
Our firm can quickly modify products to meet our major customer's requirement	**3.89**	**1.018**
Our firm can quickly introduce new product in the market	**4.17**	**1.141**
Our firm can quickly respond to changes in market demand	**3.84**	**1.037**
Our firm has an outstanding on-time delivery record to our customer	**3.45**	**1.250**
Our firm provides a high level of customer service to our major customer	**3.93**	**1.059**
Average Mean value	3.856	

N=167

Internal integration can help functions to leverage each other's resources and capabilities to jointly design products, ensure product quality and reduce duplicated tasks (Schoenherr and Swink, 2012). For example, Tan (2001) found that internal integration could create a close link between manufacturing and distribution processes to deliver products and services in a timely and effective manner. Efficient external process integration allows manufacturers to speed up product delivery processes, improve production planning and reduce inventory obsolescence using accurate information about customer demands and preferences (Swink., 2007). Further, process integration with suppliers helps manufacturers reduce mistakes and enhance product quality through information sharing and joint planning, which are directly related to the manufacturers' operational performance (Petersen. 2005). Product integration with suppliers and customers can enhance manufacturers' new product development capabilities, promoting product quality, flexibility and innovation in addition to product competitive advantage (Koufteros, 2007).

Many studies have investigated the relationship between SCI and financial performance, and it is generally accepted that the former enhances the latter. For example, Frohlich and Westbrook (2001) concluded that manufacturers with the widest degrees of supplier and customer integration achieve the best performance improvements in terms of market share and profitability. Droge et al. (2004) found that both internal and external integration were related to financial performance

through time-based performance. Zailani and Rajagopal (2005) noted that manufacturers with the greatest degrees of external customer and supplier integration achieved the highest overall performance improvement.

Furthermore, it indicates that operational performance plays an important role in the relationship between SCI and financial performance.

The overall calculated mean scores except supplier integration all the other supply chain and operational performance dimensions that have discussed above indicated better practice as all the mean scores of each supply chain dimension is above3.00.

4.4. Correlation Analysis

Under research investigation it is expected to understand concepts beyond the mean and standard deviations of the dependent and independent variables so any one needs to know howone variable is related to another which comes with the concept of correlation. Correlation isthe relationship between two variables. So, the researcher would like to see the nature, direction, andsignificance of the bivariate relationship of the variables used in the study. The BivariateCorrelationsprocedure computes the pair wise associations for a set of variables and displaysthe results in a matrix. It is useful for determining the strength and direction of the associationbetween two scale and ordinal Bivariate Correlations. As noted above, a Pearson correlationmatrix indicates the direction, strength, and significance of the bivariate relationships of allthe variables in the study. The significance of the table is to diagnose collinearly problem for multi collinearly cases. This can pick up on problems with multi collinearly that may not be evident in the correlation matrix. Tolerance and VIF are tools measure collinearly statistics, Tolerance level:is an indicator of how much of the variability of the specified independent is not explained by the other independent variables in the model and is calculating using the formula 1-R2 for each variable. With its cuts off less than 0.10 for point and VIF (1.907,4.289,2.395 and 3.636) for both measurements there is no value less than 0.10 in tolerance level and there is no point greater than 10 points in VIF value. These result enabled the researcher to say that the correlation of each independent values are consistent with the multi collinearly assumption.

Hence, in this study Bivariate Pearson Coefficient (r) was used to examine the relationshipbetween the four supply chain dimensions by using a two-tailed test of statistical significanceat the level of 95% significance, $P< 0.05$.

Interpretation of correlation coefficient (r) size is as follows: if the correlation coefficient fallsbetween 0.1 to 0.20, it is slight correlation or small; if it is between 0.20 to 0.40 is lowcorrelation or weak relationship, if it lies between 0.40 to 0.70 moderate; if it falls along 0.70to 0.90 high correlation or substantial relationship and if it is within 0.90 to 1.00 it is veryhigh correlation or very strong correlation between variables (Burns, 2008).

Table8. Correlation of independent variables with dependent variables.

Correlations

		MSI	MCI	MII	MINF	MOP
MSI	Pearson Correlation	1	.340**	.358**	.599**	.255**
	Sig. (2-tailed)		.000	.000	.000	.001
	N	167	167	167	167	167
MCI	Pearson Correlation	.340**	1	.664**	.731**	.090
	Sig. (2-tailed)	.000		.000	.000	.249
	N	167	167	167	167	167
MII	Pearson Correlation	.358**	.664**	1	.363**	.744**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	167	167	167	167	167
MINF	Pearson Correlation	.599**	.731**	.363**	1	-.023
	Sig. (2-tailed)	.000	.000	.000		.771
	N	167	167	167	167	167
MOP	Pearson Correlation	.255**	.090	.744**	-.023	1
	Sig. (2-tailed)	.001	.249	.000	.771	
	N	167	167	167	167	167

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

Table 8. Shows the correlation coefficient of the four factors measuring supply chainintegration

The internal integration is positively and strongly correlated dimensions with supplier integration, customer integration and information integration and it is statistically significant with a confidence of 99 percent. This is displayed in the table as (r=.358, p <0.01), (r=.664, p<0.01) and (r=.363, p<0.01). It is also positively correlated against operational performance at(r=.744,p<0.1).

Information integration with supplier integration, customer integration and internal integration is still another dimension and it is statistically significant with a confidence of 99 percent. This is displayed in the table as (r=.599, p <0.01), (r=.731, p<0.01) and (r=.363, p<0.01). It is negatively positively correlated against operational performance at(r=.-0.023, p<0.1)

Customer integration dimension is still has a positive association with supplier integration, internal integration and information integration and it is statistically significant with a confidence of 99 percent. This is displayed in the table as (r=.340, p <0.01), (r=.664 p<0.01) and (r=.731, p<0.01). It is also positively correlated against operational performance and has no statistical significance at p>0.1.

Supplier integration has a positive relationship with customer integration, internal integration and information integration. It isstatistically significant with a confidence of 99 percent. This is displayed in the table as(r=.340, p <0.01), (r=.358, p<0.01), (r=.599, p=<0.01).It has a positive relationship with operational performance and has no statistical significance at (r=.255, p<0.01).

4.5. Regression Analysis

Regression analysis is a way of predicting an outcome variable from one predictor variable (simple regression) or several predictor variables (multiple regressions) (Andy field, 2009). The model of regression shows how much of the variance in the measure of supply chain integration is illustrated by the underlying dimensions of predictors of supply chain model. If the value presented as tolerance less than 0.1 and the value of VIF above 10 it is required to remove one of the highly correlated interdependent variables from the model.

Table 9.Multi co linearitycoefficients

Model	Collinearity Statistics	
	Tolerance	VIF
Supplier Integration	.526	1.900
Customer Integration	.241	4.146
Internal Integration	.447	2.235
Informational Integration	.271	3.686

a. dependent Variable: operational performance

Source: Own survey Result, 2018

Based on this figure, however theresults of tolerance are not less than 0.1 and VIP not greater than 10. It is therefore possible to conclude that there is no multicollinearly effect and the inter relationships among independent variables doesn't cause concern so that multi co linearity is not the problem of the study.

Table 10.Model Summary

Model	R	R square	Adjusted R square	Std. Error of the Estimate
1	.925	.855	.851	.14723

a.Predictors: (Constant), internal integration, supplier integration, customer integration, information integration.

b.Dependent Variable: Operational Performance

Source: Own survey result, 2018

The model summary displays the significance and percentage of variation in supply chain integration which is caused by independent variables.

Multiple correlations R of .925 represent the combined correlation of all the independentvariables. Adjusted R_2 tells us that 85.10%of the variation in supply chain integration cans beexplained by variation in the four independent variables taken together. This leaves 14.90%unexplained.

Table 11.ANOVA

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20.657	4	5.164	238.252	.000[b]
	Residual	3.511	162	.022		
	Total	24.168	166			

a. Dependent Variable: Operational performance

b. Predictors: (Constant), internal integration, supplier integration, customer integration, information integration.

Source: Own survey result, 2018

In the ANOVA sub table we have the F value of 238.252 which is significant with p <1.This informs us that the four independent variables taken together as a set are significantly related to the dependent variable. The chance of obtaining these results assuming the null hypothesis to be correct is less than 10 in 1,000. The multiple correlations are therefore significant.

In order to see the contribution of factors that affect supply chain integration, regression analysis of operational performance were employed.

Table 12. Beta coefficient and significance.

Coefficient[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.489	.168		20.762	.000
	Supplier integration	.029	.061	.020	.474	.636
	Customer integration	-1.077	.079	-.832	-13.643	.000
	Internal integration	.960	.034	1.245	27.821	.000
	Informational integration	.136	.065	.121	2.102	.037

a. Dependent Variable: operational performance

Source: Own survey result, 2016

The standardize beta value shows the number of standard deviations that the outcome will change as a result of one standard deviation change in predictor. The standard deviation units are directly comparable; therefore, they provide a better insight in to the importance of a predictor in the model. Ignoring any negative sign the large the value of beta coefficient in an independent variable means the more important determinant the variable is in predictingthe dependent variable.The standardize beta value for internalintegration dimension is 1.245. This implies that, this variable has relatively strong degree of importance for analyzing the effect of supply chain integration followed by customer integrationand information integration whose beta value equals 0.832 and 0.121, respectively.

When you look at the above table, variables with higher beta values have higher level of significance so that they can contribute a lot in explaining the dependent variable. Also variables with a lower beta coefficient have a lesser level of significance and cannot contribute a lot in explaining the dependent variable.

R-square value indicates only the variance in the operational performance as it is explained by independent variables. The coefficient table depicts that the significant regression coefficients of internal integration and information integration significance at p=0.01 and customer integration at p< 0.05 , except supplier integrationThis significance level tells us that those variables uniquely contribute to the regression equation there by making a significant contribution to the prediction, but supplier integration doesn't.Since, coefficients of predictor variables are statistically significant

at less than one percent for supplier integration only and hypothesis related tothese dimensions are accepted. Others dimension of integrations are not significant and as a result nullhypothesis related to this dimension is failed to reject.

Table13. Summary of the overall outcome of the research hypothesis

	Hypothesis	Result	Reason
A	H0: Supplier integration has no significant influence on the operationalperformance of the company within a supply chain. H1. Supplier integration has a significant influence on the operationalperformance of the companywithin a supply chain.	H0:accepted H1:Rejected	ß=0.02 p>0.01
B	H0. customer integration has no significant influence on the operational performance of the enterprise H1:customer integration has a significant influence on the operational performance of the company	H0:Rejected H1: Accepted	ß=-832 p<0.01
C	H0. Internal integration has no significant influence on the operational performance of the company. H1:internal integration has a significant influence on the operational performance of the company	H0:Rejected H1:Accepted	ß=1.245 p<0.01
D	H0: Information integration has no significant influence on the operationalperformance of the company H1:Information integration has a significant influence on the operationalperformance of the company	H0:Rejected H1:Accepted	ß=0.121 p<0.05

Based on the indication of variables it can be possible to conclude that customer integration, internal integration and information integration are significantly affect the operational performance of the firm.Whereas, supplier integration has a positive relationship with operational performance but it's not significantly affect the performance of the firm.This could be due to the lesser attention the firm has given to the level of strategic partnership the firm needs to have and in developing skill of sharing of production capacity with strategic Suppliers , so that it could not get any benefit of stability of procurement and a room for adopting new technology in the production process which in turn affected the operational performance of the company.

The result of these research findings is consistent with (Stank et al. 2001) that he reported no direct association between supplier integration and operational performance or supplier integration and business performance (e.g., Flynn et al. 2010), others scholars such as (e.g., Stank et al. 2001; Swink et al. 2007) also found a negative associationbetween supplier integration and operational performance

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides the summary of major findings, conclusions and recommendation of the study.

5.1. Summary of the findings

Across the research process, the researcher investigated the effect of supply chain integration on operational performance in case of MWPPMC ,exemplified the relationship that exists between the operational performance and supply chain integration dimensions,analyzed the dimensions of supply chain integration with the intent of knowing the strength of the relationship of the dimensions in this particular case. So as to achieve the stated objectives, a combination of both quantitative and qualitative approach and regression analysis were used based on the data collected from the employees of the company.

The analysis result represents that the mean score values for supply chain integration dimensionswere below the average mean value actuallyshows thesupply chain integration of MWPPMC is ineffective or poor. Whereas, the mean score values for supply chain integration dimensions for internal integration information integration and customer integration were above the mean average which indicates that the practice of supply chain integration in the company is at a better position.

The demographic characteristics of the respondents revealed that the lion share (64.1%) was taken by male and the remaining (35.9%) was of female respondents. The company profile of the company also certified this.In addition, the large number of respondents who participated in the study survey was from the department of production weighing about half of the total participants which is 48.5%. Regarding their qualification level, more than 50% of the respondents had an award of diploma and above. At last, when we come to the work experience of the respondents, > 55% of the respondents 6 years and more which gave them adequate exposure to the work area and had a potential of bringing change to the firm which reasonably increase the validity (as a whole the quality) of this research.

The analysis result depicts that the mean score values of dimensions of supply chain such as internal integration, information integration and customer integrationexcept supplier integration were above the average mean value.The internal integration is positively and strongly correlated dimensions with supplier integration, customer integration and information integration and it is statistically significant with a confidence of 99 percent. This is displayed in the table as (r=.358, p

<0.01), (r=.664, p<0.01) and (r=.363, p<0.01). It is also positively correlated against operational performance at(r=.744,p<0.1).Information integration with supplier integration, customer integration and internal integration is still another dimension and it is statistically significant with a confidence of 99 percent. This is displayed in the table as (r=.599, p <0.01), (r=.731, p<0.01) and (r=.363, p<0.01). It is negatively positively correlated against operational performance at(r=.-0.023, p<0.1). Customer integration dimension is still has a positive association with supplier integration, internal integration and information integration and it is statistically significant with a confidence of 99 percent. This is displayed in the table as (r=.340, p <0.01), (r=.664 p<0.01) and (r=.731, p<0.01). It is also positively correlated against operational performance and has no statistical significance at p>0.1. Supplier integration has a positive relationship with customer integration, internal integration and information integration. It is statistically significant with a confidence of 99 percent. This is displayed in the table as(r=.340, p <0.01), (r=.358, p<0.01), (r=.599, p=<0.01). It has a positive relationship with operational performance and has no statistical significance at (r=.255, p<0.01). Finally, the value of regression analysis shows that customer integration, internal integration and information integration have statistically significant effect on the operational performance of the company. Whereas, supplier integration has a positive relationship with operational performance but does not affect the performance of the company significantly.

5.2. Conclusions

Currently supply chain is a key business process of great importance for the realization of business strategy. It determinesvarious key performance indicators of an organization and has a major influence on its profitability and competitiveness. Therefore, supply chain can be considered as the most suitable operational framework for a transformation process to be based on. Overall organizational performance is meant to reflect the satisfaction rate of all interested parties (customers, employees, stakeholders, suppliers and social partners)..

Four research questions were developed and addressed in this research and unfortunately except supplier integration all the dimensions were rated above the average mean value of 3.00. In other words, it shows a supply chain integration practice at the required level of its employees' .andbetter existence of supply chain practice in MWPPMC.The study also found a positive correlation among the four (internal integration, information integration, customer integration and supplier integration) supply chain dimensions. They are statistically significant at 99 percent.Therefore, it is possible to conclude that there is a significant and positiverelationship among the four supply chain integration dimensions which this study was reliedon.Based on the indication of variables in regression analysis, it can be possible to conclude thatinternal integration has a positive and significant effect on operational performance of the company, information integration has a positive and significant effect on operational performance of the company, and customer integration has a positive and significant effect on operational performance of the company, Whereas, supplier integration has a positive but nostatistically significant effect on operational performance of the company.This could be due to the lesser attention the firm has given to the level of strategic partnership the firm needs to have and in developing skill of sharing of production capacity with strategic suppliers , so that it could not get any benefit of stability of procurement and a room for adopting new technology in the production process which in turn affected the operational performance of the company. The result of these research findings is consistent with (Stank et al. 2001) that he reported no direct association between supplier integration and operational performance or supplier integration and business performance (e.g., Flynn et al. 2010), others scholars such as (e.g. Swink et al. 2007;Stank et al. 2001) also found a negative associationbetween supplier integration and operational performance.

5.3. Recommendation

The focus of this research was about dimensions of supply chain integration and the result pointed out the existence of positive and significant relationship between customer integration, supplier integration, internal integration, information integration and performance of the company.

Managers should therefore improve the extent of integration of the four variables.

Based on the findings of this study the researcher suggests the subsequent points as plausiblerecommendations to the problem identified.

- The integration of internal function within the firm is a primary activity in any organization. The enterprise should have to give a critical emphasis on alignment among departments through better data integration and creating continuous interdepartmental contact among internal functions. Besides, the enterprise should have to equip itself with modern technologies like enterprise resource planning systems which benefits the company through better integration.
- Information integration within upper and downstream of SC partners is a major activity in SCI. The firm should have to work closely with SC partners keep itself from the issues that affect its business like bullwhip effect
- Without the integration of customer into the firm it is impossible to survive in the market. Linking the customer through information network with the company to get feedback from the customer and creating an access of computerization for customer ordering is crucial factors while considering the integration of customer.
- Building a long term strategic supplier relationship with the right supplier for strategically important items which are effectively categorizing based on their level of significance is a useful strategy to get the benefit the company gains from technical support in the production process,new technology assistances ,reduction of longer lead times, and minimizing supply disruptions.
- The findingsof the study indicate that internal integration,information integration and customer integration have contributed much more to the performance of the manufacturing firms.So efforts should be made to better integrate with suppliers and analyze the impact derived from higher strategic supplier relationship formation by doing so suppliers will be empoweredto have a direct impact on the company's performance.

5.4. Further Research for

The subsequent areas of further studies are recommended:

- A study that will assess the challenges affecting supply chain integration in theplastic products manufacturing industry so that it will expose the effect that need to be addressed for improved performance.
- The researcher recommends that researchers need to undertake a comparative analysis on the effect ofsupply chain integration on operational performance with other similar businessesthat are found in the country.
- Future researches should also conduct a study that will assess the barriers of implementation of supply chain integration strategies in plastic manufacturing industry. This study will be important in that it will help the firm to identify areas within the market that require to be polished in order to increase the performance.
- The study is limited to manufacturing firms and hence the model might not work in other sectors of the economy.So future researches might focus on replicating this model in the service and other sector of the economy.
- Additionalsupply chain dimensions and operational performance outcomes needs additional attention while doing future researches on the subject matter.
- Although the finding clearly shows supply chain integration-performance relationship from the perspective of the focal firm, there is a room for future researches to investigate the effect of supply chain integration on the whole supply chain partners or network.

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ANNEXES

Correlation

	MSI	MCI	MII	MINF	MOP

MSI	Pearson Correlation	1	.340**	.358**	.599**	.255**
	Sig. (2-tailed)		.000	.000	.000	.001
	N	167	167	167	167	167
MCI	Pearson Correlation	.340**	1	.664**	.731**	.090
	Sig. (2-tailed)	.000		.000	.000	.249
	N	167	167	167	167	167
Innew	Pearson Correlation	.358**	.664**	1	.363**	.744**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	167	167	167	167	167
MINF	Pearson Correlation	.599**	.731**	.363**	1	-.023
	Sig. (2-tailed)	.000	.000	.000		.771
	N	167	167	167	167	167
MOP	Pearson Correlation	.255**	.090	.744**	-.023	1
	Sig. (2-tailed)	.001	.249	.000	.771	
	N	167	167	167	167	167

Model Summary[b]

Model	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
1	.855	.851	.14723	.855	238.252	4	162	.000	.395

a. Predictors: (Constant), MINF, iint, MSI, MCI

b. Dependent Variable: MOP

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.657	4	5.164	238.252	.000[b]
	Residual	3.511	162	.022		

Total	24.168	166			

a. Dependent Variable: MOP

b. Predictors: (Constant), MINF, innew, MSI, MCI

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	3.489	.168		20.762	.000	3.157	3.821					
	.029	.061	.020	.474	.636	-.092	.149	.255	.037	.014	.526	1.900
	-1.077	.079	-.832	-13.643	.000	-1.233	-.921	.090	-.731	-.409	.241	4.146
	.960	.034	1.245	27.821	.000	.892	1.028	.744	.909	.833	.447	2.235
	.136	.065	.121	2.102	.037	.008	.264	-.023	.163	.063	.271	3.686

a. Dependent Variable: MOP

Descriptive Statistics

	N	Mean	Std. Deviation

The level of information exchange with your major supplier through information networks	167	3.43	.868
The level at which your supplier share their production capacity with you	167	2.78	.939
The level at which your supplier share their production schedule with you	167	3.08	1.064
Sharing your production plan with your supplier	167	3.02	.782
The level of strategic partnership with your supplier	167	2.11	.864
Valid N (listwise)	167		

Descriptive Statistics

	N	Mean	Std. Deviation
The level of linkage with your customer through information networks	167	3.16	.996
The level of computerization for ease of customer ordering	167	3.53	.849
The level of communication with major customers	167	3.39	.924
The establishment of quick ordering systems with your major customers	167	2.98	1.003
The level of sharing of available inventory with the major customers	167	3.20	.983
The level of sharing of market information from the major customer	167	3.07	1.001
Valid N (listwise)	167		

Descriptive Statistics

	N	Mean	Std. Deviation
ensuring data integration among internal functions	167	4.17	1.141
Enterprise application integration among internal functions	167	3.84	1.037
The level of utilization of periodic interdepartmental meetings among internal functions	167	3.45	1.250
The use of cross functional teams in process improvement	167	2.72	.962
Integrative inventory management	167	3.16	.996
Valid N (listwise)	167		

Descriptive Statistics

	N	Mean	Std. Deviation
Timely sharing of information across the members of supply chain	167	3.53	.849
Strong coordination in the flow of information among partners	167	3.39	.924
There is strong utilization of information among supply chain partners	167	2.11	.864
The firm informs trading partners in advance of changing needs.	167	3.16	.996
The firm partners share proprietary information with us.	167	3.31	.955
Valid N (listwise)	167		

Descriptive Statistics

	N	Mean	Std. Deviation

Our firm can quickly modify products to meet our major customer's requirement	167	3.89	1.018
Our firm can quickly introduce new product in the market	167	4.17	1.141
Our firm can quickly respond to changes in market demand	167	3.84	1.037
Our firm has an outstanding on-time delivery record to our customer	167	3.45	1.250
Our firm provides a high level of customer service to our major customer	167	3.93	1.059
Valid N (listwise)	167		

ANNEX I

CONSENT TO PARTICIPATE IN A RESEARCH WHICH STUDIES THE EFFECT OF SUPPLY CHAIN INTEGRATION ON OPERATIONAL PERFORMANCE IN CASE OF MW PLASTIC PRODUCTS MANUFACTURING COMPANY (MWPPMC).

Greetings!

My name is BediluMandefro from Addis Ababa University School of Commerce. I am conducting a research study on the effect of supply chain integration on Operational Performance in case of **MWPPMC**.

Purpose of the Study

The study will examine the practice of supply chain management, currently used in **MWPPMC** and the integration of supply chain both internally and externally.

Participation

If you agree to join the study, you will be required to answer all the questions that will be asked by the investigator through questionnaire.

Confidentiality

All information that will be collected from you will be treated confidential and will not be used for any other purpose other than this study.

Risks

I do not expect any harm will happen to you because of joining this study.

Rights to Withdraw and Alternatives

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will continue to be treated normally. You can stop participating in this study at any time, even if you have already given your consent and if for any reason you would wish to come back into the study after withdrawal, we will be ready to accept you to continue with the study. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

Taking part in this study you will contribute towards showing the effect of supply chain integration on the performance of business. Your information and others participating in the study will collectively be used by policy makers in addressing this problem hence scientificutilization of supply chain practices. You will receive the new information about this study uponcompletion.

Who to Contact

If you ever have questions about this study, you should contact the following:

Mr. BediluMandefro(Principal Investigator)
Addis Ababa University, Faculty of Business and Economics,
School of Commerce
Email: bedilumandefro2010@gmail.com
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Busha Temesgen (Study advisor)
Assistant Professor of the Addis Ababa University,
Addis Ababa University Faculty of Business and Economics,
School of commerce
Email:
Mobile: 0911869719

Do you agree to participate? Write the word 'Yes' if you agree……..

I, _____ have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of investigator _____

Date of signed consent _____

ANNEX II

QUESTIONNAIRE TO BE FILLED BY EMPLOYEES OF MWPPMC

Dear respondent,

First I want to put my gratitude for your time in responding to the research questions provided below. I'm a postgraduate student at Addis Ababa university school of commercefrom thedepartment of logistics and supply chain management, currently working on thesis project. Theresponse you provide me gives a critical input to my research "**The Effect of Supply ChainIntegration on Operational Performance in Case of MWPPMC**

You have been identified as one of the respondents for this study and you are kindly requested tofill the questionnaire. Information given will be held with confidentiality and will be used purelyfor research purposes.

Instruction: *Please tick inside the boxes as appropriate*

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1**. Gender**

a) Male b) Femal

2. Department:

Facility and logistics Quality Operations

Production Operation

3. **Qualification:**

CertificateDiplomegreeMastree

PhD

4. Experience

Less than 1 year1 6-10 years More than 1

SECTION B: THE EFFECT OF SUPPLY CHAIN INTEGRATION ON OPERATIONAL PERFORMANCE IN MWPPMC.

.

With regard to your firm, please tick the appropriate number to indicate the extent to which you agree or disagree with each statement. The item scales are five-point Likert type scales with 1 **=** strongly disagree,2 **=** disagree, 3 **=** neutral, 4 **=** agree, 5 **=** strongly agree

S.N	Levels of Integration	1	2	3	4	5
A	**Internal Integration**					
1	Ensuring data integration among internal functions					
2	Enterprise application integration among internal functions					
3	The level of utilization of periodic interdepartmental meetings among internal functions					
4	The use of cross functional teams in process improvement					
5	Integrative inventory management					
B	**Information integration**					
1	Timely sharing of information across the members of supply chain					
2	Strong coordination in the flow of information among partners					
3	There is strong utilization of information among supply chain partners					
4	The firm informs trading partners in advance of changing needs					
5	The firm partners share proprietary information with us.					
C	**Customer integration**					
1	The level of linkage with your customer through information networks is high					
2	The level of computerization for ease of customer ordering is high					
3	The level of communication with major customers is high					
4	The establishment of quick ordering systems with your major customers					
5	The level of sharing of available inventory with					

	the customer is high					
D	**Supplier Integration**					
1	The level of information exchange with your major supplier through information networks is high					
2	Your supplier share their production capacity with you					
3	Your supplier share their production schedule with you					
4	Sharing your production plan with your supplier is high					
5	The level of strategic partnership with your supplier is high					
E	**Operational performance**: please indicate the degree to which you agree to the following statements concerning your company's Performance with respect to your customer. (1=Strongly disagree,2=Disagree,3=Neutral ,4=Agree,5=Strongly agree)					
1	Our firm can quickly modify products to meet our major customer's requirement					
2	Our firm can quickly introduce new product in the market					
3	Our firm can quickly respond to changes in market demand					
4	Our firm has an outstanding on-time delivery record to our customer					
5	Our firm provides a high level of customer service to our major customer					