SUPPLY CHAIN MANAGEMENT: A MODEL FOR IMPLEMENTATION FOR SME'S IN SAUDI ARABIA

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ABSTRACT

With markets going global and competitions turning intense, Organizations are fast realizing the immense potential of a proactive Supply Chain Management (SCM) to improving their market positions in this cut-throat business environment.

The research aims at developing a supply chain framework model that enables SMEs to improve their SCM performance and to have a sustainable business growth in dynamic environment. To fulfill the foremost aim, the following objectives have been set as follows.

To fulfill the foremost aim, the following objectives have been set:

1. To contribute to the bod of knowledge to the both Supply Chain Management and Saudi Arabian SMEs manufacturing by reviewing pertinent literature of the same field. Knowledge in this study refers to as information, understanding and skills that one gain during research and education.
2. To investigate the current SCM practice of Saudi Arabia SMEs manufacturing sector by explorative approach, broad reliable and valid survey questionnaires distributed to 320 SMEs companies (Chapter 4).
3. To identify the gap within the current supply chain dimensions of SMEs against world class companies (Chapter 5) by statistical analyzing the survey questionnaires developed in chapter four.
4. To suggest appropriate methodological design using robust techniques that is to developed framework model (Chapter 6).
5. To develop qualitative assessment approach in the form of focus group to theoretically and practically validate and test the framework model (Chapter 6).
6. To benchmark the developed model with different model in the same field.

A sample of 150 of Saudi Arabia SMEs within the manufacturing sector was surveyed aimed at identifying the gap between SCM practices as adopted by the world class organizations and the actual practices adopted by SMEs under investigation.

The research carried out using multiple research methods, i.e. quantitative and qualitative methods. This is mainly to gain multiple perspectives on the issue and filter out the real problem to be understood and worked upon.

The framework model was developed based on literature review, other works in the same field, and the results of the field work study (survey) and the working experience of the researcher in the manufacturing sector for more than 20 years. The model was validated theoretically and practically with a predetermined selected manufacturing company.

The significance of the research work could be best understood from the overall results which make important contributions to supply chain management system. The study is significant as it aids in better understanding of an issue which is of increasing importance to both the organizational practice and academic literature.

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CHAPTER ONE

INTRODUCTION

This chapter provides the research background by highlighting the importance of the supply chain management and its dimension, followed by the research aim and objectives. The chapter acquaints readers with importance of SMEs industry to the national economy. Subsequently, a glance at the research methodology is presented. Framework model rationale is given. Finally, an overview of the thesis structure is presented.

1-1 Background

Effective Supply Chain Management (SCM) has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations, but among supply chains. It has been pointed out that understanding and practicing (SCM) has become an essential prerequisite to staying in the competitive global race and to growing profitably (Power et al., 2001; Moberg et al., 2002).

A Supply chain consists of all the stages that are required to satisfy the customer request. It starts with the supplier and passes through the manufacturing, distribution, and retailing and finally reaches the customer.

SCM is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer.

In the SCM there are mainly three flows. They are as follows:

- ✓ Product flow: The movement of goods from a supplier to a customer, through the manufacturer, distributor, and retailer.
- ✓ Information flow: It involves transmitting orders and updating the status of delivery. The information flow is useful for the success of the supply chain management.
- ✓ Financial flow: It consists of credit terms, payment schedules, discount information and consignment and title ownership arrangements.

In the SCM the product/ service flows towards the end customer. While the information flows both the sides. And the financial flows towards the supplier, that means the customer pays for the product or service receiving.

There are many benefits of SCM. The main two are as follows:

- ✓ Achieving high level of customer satisfaction
- ✓ Reducing cost, that means achieving the optimum life cycle cost. This involves minimizing the wastage during reaching the customer.

In SCM an organization should concentrate on six major areas in order to achieve the twin benefits of SCM. They are,

1. Supplier Relations Management (SRM)
2. Employee Relations Management (ERM)
3. Customer Relations Management (CRM)
4. Logistics Service Providers (LSP) Relations Management
5. Information Technology
6. Operation efficiency

1-2 Supply Chain Management Definition

The Term SCM has been used to explain the planning and control of materials and information flows as well as the logistics activities not only internally within a company but also externally between companies (Cooper et. al., 1997: Fisher, 1997).

Many authors provide their definitions on a supply chain Management. According to Scott and Westbrook (1991), the term `supply chain' is used to refer to the chain linking each element of the production and supply process from raw materials through to the end customer.

From all definitions (Chapter 2), one can understand the objective of SCM. It is to achieve operational excellence throughout the enterprise by maximizing revenue, minimizing expenses and making full use of all the assets. The result is superior profitability, increased market share and responsiveness to customer demand. SCM enables a comprehensive integration of all business processes within and outside the enterprise that enables the

exchange of information and movement of goods, services and money. SCM is an operational paradigm, which looks at a business as a chain of interconnected entities, thus providing a see-through perspective of the entire business. It holds untapped sources of competitive advantage for organization that need to get their products or services to the market in competition from other organizations.

2- Research Aim and Objectives

2-1 Research Aim

The research aims at developing a framework model that enables SMEs to improve their SCM performance and to have a sustainable business growth in dynamic environment.

2-2 Research Objectives

To fulfill the foremost aim, the following objectives have been set:

1. **To contribute to the bod of knowledge to the both Supply Chain Management and Saudi Arabian SMEs manufacturing by reviewing pertinent literature of the same field. Knowledge in this study refers to as information, understanding and skills that one gain during research and education.**

2. **To investigate the current SCM practice of Saudi Arabia SMEs manufacturing sector by explorative approach, broad reliable and valid survey questionnaires distributed to 320 SMEs companies (Chapter 4).**

3. **To identify the gap within the current supply chain dimensions of SMEs against world class companies (Chapter 5) by statistical analyzing the survey questionnaires developed in chapter four.**

4. **To suggest appropriate methodological design using robust techniques that is to developed framework model (Chapter 6).**

5. **To develop qualitative assessment approach in the form of focus group to theoretically and practically validate and test the framework model (Chapter 6)**

6. **To benchmark the developed model with different model in the same field.**

3- Supply Chain Dimensions

Supply chain dimensions are those dimensions which are mandatory to the success of any organization, in the sense that, if objectives associated with the dimensions are not achieved, the organization will fail. In the context of world class strategy, supply chain management dimensions represent the essential component without which a strategy stands little chance of success. SCM dimension is proposed to be a multi-dimensional concept, and hence viewed as a more comprehensive concept than the narrower view (the supplier side, the internal side or the customer side) taken in most prior research.

Dimensions that have contributed to the successful supply chain management have been well researched over the years by different authors. Injazz and Antony (2004) reviewed over 400 articles from the diverse disciplines which made their study may be the most comprehensive analysis of the multidisciplinary, wide-ranging research on SCM. The result is a set of reliable, valid, and uni-dimensional measurements that can be subsequently used in different contexts to refine or extend conceptualization and measurements or to test various theoretical models, paving the way for theory building in SCM.

All these researches have been made with main purpose which was to develop a reliable and valid instrument.

It should be pointed out that even though the constructs used for this study capture the major aspects of SCM dimensions, they cannot be considered complete. Other factors, such as total quality management dimensions (Tan et al., 2002), internal integration (Pagell, 2004; Braganza, 2002), geographical proximity, cross-functional teams, agreed vision and

goals, and agreed supply chain leadership (Min and Mentzer, 2004) are also identified in the literature.

The author, for the purpose of this study focuses the research around the basic definition of supply chain management. The definition of which looks to a focal company that extent its one arm backward to its supplier and the second arm forward to its customer with two different flows; material and information. Though other dimensions are of great interest, they are not included due to the concerns regarding the length of the survey.

The supply chain dimensions of this study include dimensions related to manufacturing strategy, supplier relationship dimension, customer relation management as foreword relation management strategy. Material mobility, internally and externally forewords and information flow backward of the chain, were also included. Supply chain initiatives were extracted from literature and included in this study, to find out the future strategy toward improving the organizations supply chain. Performance measurements including financial and operational performance were included to assess the supply chain strategy of an organization. These dimensions were the base for the literature review discussed in the second chapter.

4- Small- Medium-sized Enterprise

The Small-Medium-sized Enterprise (SME) sector is an important part of any national economy (Storey, 1994). It contributes to economic growth, both regional and national. In Europe, while industrial giants continue to slash jobs, high-growth SMEs are creating thousands of new jobs in manufacturing and services (Flynn, 1998). They constitute a large part of the economy in most countries, dominate the industrial and commercial infrastructure and have significant roles in economic growth (OECD, 1996; Tetteh and Burn, 1999; Curran and Blackburn, 2001). In developing countries, SMEs continue to play a critical role in their country's industrialization program through the strengthening of both forward and backward industrial linkages.

They are not only providing job opportunities, but also, acting as suppliers of goods and services to large organizations, and any lack of their product quality could adversely affect the competitive ability of the larger organizations (Rose, 2000; Greenan et al., 1997;

Ghobadian and Gallear, 1996; Parkin and Parkin, 1996; Storey, 1994). In manufacturing sector, SMEs act as specialist suppliers of components, parts, and sub-assemblies to larger companies because the items can be produced at a cheaper cost than the large companies could achieve in-house.

With dramatic change towards global market orientation and trade liberalization, most of the business people realize the vital role of SMEs. The SMEs assume these roles by complementing the activities of the large-scale industries through integration into the mainstream industrial development.

4-1 Small and Medium Enterprises Definition

At present, there seems to be no consensus on the definition for SMEs. Variations exist among countries and industries. Storey (1994) argued that there is no single, distinct and uniformly acceptable definition of a small firm. When reviewing the literatures you come across an array of definitions (chapter 3). This is because employment, turnover and capitalization vary among different industries. Additionally, any size definition that relates standard measures of size at a particular activity level may be relatively small or large in comparison to other industries. According to early critical contributions, SMEs must satisfy criteria related to *markets, ownership* and *control.* Another perspective on defining an SME attempts to identify those characteristics, other than size, which distinguish a small enterprise from a larger one, which are: *uncertainty, innovation* and *evolution* Wynarczyk et al (1993).

4-2 Features of SMEs

Although there is neither a simple nor a single definition of an SME yet there are certain features which are used to define them. The defining features of SMEs are the size of the labor force and turnover, while assets and equity are also used as criteria. In general, SMEs are defined by a number of factors and criteria such as location, size, age, structure, and organization, number of employees, sales volume or worth of assets. However, in dimension, most researchers and authors used both the quantitative and qualitative methods to define SMEs. In terms of the quantitative criteria, the number of employees is the most frequently used yardstick to determine the size of a SME in several countries (Hashim and Wafa, 2002; Yusof, 2000; Anthony, 1983).

5- Supply Chain Management and SMEs: What is the link?

The role of supply chain is widely recognized as being a critical determinant in the success and survival of both manufacturing and service organizations in today's competitive environment, and thus, has focused attention on its effectiveness. In a number of organizations, cost-effective supply chain is a matter of survival. The globalization of some sources makes it essential that the professional dimension is improved and regarded as a key element in the preparation of company or organization strategies (Quayle, 1998; Beamon, 1999).

In more recent years the importance of supply chain management to the smaller firms has become a significantly recognized. They participate in value creating activities, especially for larger firms. They supply raw materials, produce products, and distribute finished goods to customers. Through their efforts, SMEs have significant impacts on supply chain processes (Huin et al., 2002). SMEs are often suppliers of goods and services to larger organizations. Increasingly, they have felt the impact of the quality programs imposed on them. The lack of product quality from SMEs adversely affects the competitive ability of the larger organizations. Because of this reason the larger companies have insisted that their small suppliers adopt TQM of their own (Barrier, 1992; Ghobadian and Gallear, 1996).

Many studies found that supply chain could be used by SMEs with considerable success. Studies by Spekman et al (1998) and Quayle (2003) found that the introduction of supply chain has helped in reducing costs without compromising on customer satisfaction levels. According to Alam, A. (1996), the perceived and realized benefits of SCM system consists of tangible and intangible benefits. The tangible benefits of SCM implementation include shortening the product development life cycle, increasing on-time order delivery, reducing production costs, improving quality, reducing inventory, and bettering inventory management. On the other hand, the intangible benefits include improving service quality, faster response to customer needs, sharing and exchanging information, providing information accurately, timely, and consistently. Tan *et al.* (1998) sought a relationship between firms' SCM dimension and their performance. They were able to show positive and significant correlation between certain SCM dimensions and performances of their respondent firms.

6- Research Methodology

There are many ways to approach an identified organizational phenomenon or problem. The choice of methodology naturally relates to the paradigmatic view of the researcher, and the research strategy naturally affects the results (Morgan 1983). In research methods context, there are three main positions; qualitative, qualitative and a combined of both (multiple approach). Each contains important differences which will influence the way in which the researcher thinks about the research process.

In quantitative research methods, the science (social or human) problem is composed of variables, measured with numbers, and analyzed with statistical procedures, in order to determine whether the predictive generalizations of the theory hold true (Creswell, 2005). It

is appropriate where a researcher seeks to quantify relationships between variables of interest, in order to formulate and test hypotheses derived from theories that may therefore be either accepted or rejected on the basis of comparative and statistical analyses. In this way, a quantitative approach is inclined to be deductive.
Quantitative methods focus on the strict quantification of observations (data) and on careful control of empirical variables. Quantitative research often incorporates large scale sampling and the use of statistical procedures to examine group means and variances (Ponterotto&Grieger, 1999). Quantitative studies stress the measurement and analysis of causal or correlation relationships between variables (Denzin& Lincoln, 2000).

In contrast, qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomenon. Miles &Huberman, (1994) define qualitative methods as a set of data collection and analysis techniques that emphasize the fine grained, the process oriented, and the experiential and that provide a means for developing an understanding of complex phenomena from the perspectives of those who are living it. Other scholars like Burns & Grove (1998) state that qualitative research refers to inductive, holistic, subjective and process-oriented methods used to understand, interpret, describe and develop theory on a phenomenon or a setting and is a systematic, subjective approach used to describe life experiences and give them meaning.

Qualitative methods are most often used for theory building. In these cases, a phenomenon exists that is poorly understood, so poorly that the relevant variables and linkages cannot be specified a priori (Pamela, 2004). In these circumstances the researcher would immerse herself in the phenomenon of interest, interviewing participants, observing activities within the organization, and gathering archival information in an attempt to build a better understanding.

While most often used for theory building purposes, qualitative methods can also be used to test theory. For example, Barr et al. (1992) conducted a qualitative analysis of archival documents from two companies to test their hypotheses about the relationship between environmental change, management beliefs, and the timing of strategic change. Their results did support their hypothesis that the organization in which management more rapidly changed their understanding of the environment also was the first to change its strategy.

Using qualitative research method in supply chain management provide the opportunity to identify and explain complex relationships without having to pre-specify either the variables involved, or the nature of the relationship between them. The research will develop more understanding of the phenomena under investigation as he or she immersed deeply in the problem thru using different data collection techniques available. Such understanding will not be available thru using survey questioners.

Pamela (2004) stated that the unique benefit of qualitative methods is the ability to develop detailed understandings and thick descriptions of the phenomenon of interest. Qualitative data are rich and complex, often comprising hundreds of pages of interview transcripts, field notes, and/or archival documents. The end result is a logically compelling analysis that not only identifies and describes key constructs and/or explains the relationships among them, but also contextualizes the findings (Strauss & Corbin, 1998).

In the real world, supply chain is a complex phenomenon that hardly to be solved with a single methodology. Thus, multiple approaches are required in order to develop a holistic understanding of supply chain management phenomena. It is only with multiple perspectives that true picture of a problem could be visualized and understood.

Boyer and Swink (2008), argued that from a methodological standpoint, the right paradigm is one which incorporates multiple, complementary methodologies, in order to triangulate findings (Flynn et al., 1990) and to ensure that the weaknesses of any one methodology are offset by the use of complementary methodologies (McGrath, 1982) within a specific area of inquiry within any research field.

7- Framework Model Rationale

Popper (1994) defines a framework as a set of basic fundamental principles, which can help to promote discussions and actions. The authors have defined framework as a set of simplified theoretical principles and practical guidelines for implementation and adoption, which can enhance the chance of success that are easy to understand.

Frameworks portray through diagrams, flowcharts, and graphical or pictorial representations (Yusof, 2000). A framework is used in research to outline possible courses of action or to present a preferred approach to an idea or thought.

Struebing and Klaus (1997) believed a sound framework should define what the organization does, what it is trying to do, how it is going to do it and ensure that each step is done in the correct sequences.

To improve the SMEs supply chain capability in so dynamic market, a proposed framework model that is believed to level up a company in a better position in the chain is suggested.

The illustration representation given in Figure 7-1 which considered the basis of this study identifies the four major components of the Framework Model. These components are closely inter-related. In many respects, this is a fairly generic framework model that may apply across a number of business settings. A number of typical elements have been identified within each of the four major components. These are the framework model foundation, framework model body, the framework model house roof, and finally the framework model boundary. The components of the framework model are now described hereunder in detail.

- First Component: The framework model house roof

- Second Component: The framework model body
- Third Component: The framework model foundation
- Fourth Component: The framework model boundary

The rationale underlying this research framework model is straightforward. First, the implementation of SCM dimension should be driven and facilitated by management commitment. The management role behind the success or failure of any project initiative is well documented in several studies.

The current dynamic business environment is characterized by high complexity and fiercer competition mainly because of higher levels of manufacturing outsourcing, new technologies, and shorter product life-cycles due to rapidly changing customer preferences. All these and more factors often force companies to assume more ''calculated risks'', risks that managers must accept in order to improve competitiveness, reduce costs and improve profitability. However, the downside potential of the ''calculated risks'' could have adverse consequences that jeopardize the whole supply chain's ability to serve the final customers, thus affecting firms' long-term goal accomplishment (Svensson, 2002).

The business to be sustainable has to be measured. Normally, the business success is measured by financial and operational performance. A higher level of SCM performance will lead to an enhanced competitive advantage and further position an organization in higher level of market lead.

Tompkins et al. (1998) have emphasized the importance of continuous improvement processes within the value chain and subsequently coined the term "Supply Chain Synthesis" (SCS). This is a continuous improvement process that ensures the satisfaction of all players in the supply chain from original raw material providers to the finished product consumer.

8- Thesis Outline

In order to achieve the aforementioned objectives, the thesis is divided into seven chapters, each representing a different stage of the research process.

Chapter One: Introduction. This chapter highlights the importance of the study problem and the methodology to attain the research results. Furthermore, it provides a brief discussion of the aim and objectives purpose of this research. Finally, an overview of the dissertation structure is provided.

Chapter Two: Literature Review. This chapter reviews the critical body of current knowledge which is made up of the relevant studies and knowledge that address the subject area. It aims to provide a comprehensive review of all the literature on the subject under investigation. It is also identify, describes, evaluates, and summarizes the current body of knowledge in the supply chain management dimension.

Chapter Three: Saudi Arabia Small and Medium Enterprises - This chapter reviews the Saudi Arabia profile. Special focus on the country's SMEs was given. Furthermore, the link between supply chain management and SMEs enterprises is discussed in the last part of this chapter. The discussion attains to show how SMEs benefit from adopting the supply chain management system.

Chapter Four: Research Methodology and Fieldworks - In this chapter, the research philosophy and fieldworks are discussed in details. Firstly, the author discusses different research methodologies, approaches and tools are reviewed. The research quality aspects; reliability and validity are also discussed.

Secondly, the researcher describes in detail the strategy of developing the questionnaires design, sampling, survey administration, and piloting, amendment, developing the final version of the survey questionnaires, distribution and data collection. In addition, the chapter discusses the data analysis tool which used in this research.

Chapter Five: Data Analysis- This chapter is concerned with providing a comprehensive analysis of the empirical data and presents the results of the study by describing the descriptive findings. The chapter starts with giving a detail description of the sample characteristics, followed by data quality assessments are also presented. The descriptive findings of each construct and results interpretation are shown in detail.

Chapter Six: Framework model development and validation- The chapter aims to develop a framework for supply chain system of Saudi Arabia –SMEs. The framework is then validated and tested theoretically and practically, by developing a self-assessment procedure to piloting the study in designated SME in Saudi Arabia, to see whether it works or it doesn't and why.

Chapter Seven: Conclusion, Contribution, Limitation and Future Research. This chapter presents the general conclusions from the existing body of research, and implications of findings for managers and academic researchers. It further, addresses the study limitation and what is to come in terms of the focus of future research.

Fig 1-1Research Outline, ***Source: The author***

CHAPTER TWO
LITERATURE REVIEW

This chapter reviews the critical body of current knowledge which is made up of the relevant studies and knowledge that address the subject area. It aims to provide a comprehensive review of all the literature on the subject under investigation. It also identifies, describes, evaluates, and summarizes the current body of knowledge in the supply chain management dimension.

2-1 Introduction

Increasingly global market, independent of size or industrial sector, is reliant on chains sub-contracting to provide raw materials and facilitate in execution customer orders. The success in such business environment will indeed increasingly be based on quality, cost, delivery and service provided. Globally, increasing competition has caused the business to be improved.

On the other hand, consumer pressures for lower prices and higher quality of service are forcing the main supply chain players; suppliers, manufacturers and distributors to achieve greater business effectiveness and efficiency. Making supply chain efficiency is a key factor in gaining competitive advantage. As a result, both retailers and manufacturers are increasingly looking across the supply chain, beyond their traditional logistics boundaries, to form partnerships, with the aim of creating a seamless flow of goods and information from raw materials supplier to the end customer.

It is well recognized that adoption of supply chain management principle is one approach which has been demonstrated to provide success business competitiveness. It is making an increasing positive impact in world industry.

2-2 Supply Chain Definition

The key ideas and concepts proposed by different authors on SCM are given with a view to understand the main questions and problems. The term Supply Chain Management was originally introduced by consultant in the early 1980s (Oliver and Webber1992) and has subsequently gained tremendous attention (La Londe, 1998), analytically, a typical supply chain as shown in figure. (1) a network of materials, information and services processing links with the characteristics of supply, transformation and demand.

The term SCM has been used to explain the planning and control of materials and information flows as well as the logistics activities not only internally with in a company but also externally between companies.(I.J Chen, Paulraj 2004).

Many authors provide their definitions on a supply chain Management. According to Scott and Westbrook (1991), the term `supply chain' is used to refer to the chain linking each element of the production and supply process from raw materials through to the end customer. Typically such a chain will cross several organizational boundaries. It consists of flows of materials and product through various production and distribution processes in one direction and flows of information to provide control mechanisms, mostly in the other direction. The definition emphasizes on the supply processes and the activities involved.

A supply chain can also be viewed as a system. Towill (1992) outline a supply chain as a system, the constituent parts of which include material suppliers, production facilities, distribution services and customers linked together via the feed forward flow of materials and the feedback flow of information.

Supply chain management could be understood as Network. Christopher (1992) defines a supply chain as the 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 the ultimate consumer. Lee and

Billington (1993) define a supply chain as a network of facilities that performs the functions of procurement of material, transformation of material to intermediate and finished products, and distribution of finished products to customers. Scholar like Davis (1993) looks at a supply chain simply as a network of material processing cells with the following characteristics: supply, transformation, and demand.

The meaning of `network' is made explicit by Axelsson and Easton (1992) who define a network as `a model or metaphor which describes a number, usually a large number, of entities, which are connected. In the case of industrial as opposed to, say, social, communication or electrical networks, the entities are actors involved in the economic exchanges which are themselves conducted within the framework of an enduring relationship. The existence of such relationships is the raison deter for industrial networks. They provide the stability, and hence structure, which makes the network proper.

The above definitions have formed a basis for defining the term of `supply chain' by later authors and this view is also supported by Handfield and Nichols (1999) who state that `Supply chains are essentially a series of linked suppliers and customers; every customer is in turn a supplier to the next downstream organization until a finished product reaches the ultimate end user.'

"The supply chain encompasses all activities associated with the transformation of goods from the raw-material stage to the final stage, when the goods and services reach the end customer." (Janat shah, 1999)

The operating responsibility of SCM is the geographical positioning of raw materials, work in progress, and finished inventories where required at the lowest cost possible. It is through the logistical process that materials flow in to the vast manufacturing capacity of an industrial nation and products are distributed through marketing channels to consumers.

Table 2-1 Supply Chain: Various Connotations

Authors	Connotations
Beamon (1999)	An integrated process where raw materials are transformed in to final products then delivered to customers.
Berry (1995)	A system whose constituent parts include material supplies, production facilities, distribution services and customers linked together by feed forward flow of materials and feedback flow of information.
Brown (1987)	A complex, dynamic network or system of interconnected and interdependent individuals, groups, companies, organizations, and relationships whose goal is to satisfy and add value to their particular customer.
Johnson (1996)	A process of strategically managing the movement and storage of materials, parts and finished inventory from suppliers through the firm and on to the customers.
Towill (1997)	An integrating process based on flawless delivery of basic and cus›mized services.
Hicks (1999)	Systematic effort to provide integrated management to meet customer needs and expectation from the suppliers of raw materials through manufacturing to end-Customers.
Thomas and Griffin(1996)	Management of material and information flows, both in and between facilities such as vendors, manufacturing and assembly plants and distribution centers.

Source: (R.P Mohanty, S.G. Deshmukh, P 2009)

From all definitions above shown in Table (2-1), it could be understood the objective of SCM. It is to achieve operational excellence throughout the enterprise by maximizing revenue, minimizing expenses and making full use of all the assets. The result is superior profitability, increased market share and responsiveness to customer demand. SCM enables a comprehensive integration of all business processes within and outside the enterprise that enables the exchange of information and movement of goods, services and money. SCM is an operational paradigm, which looks at a business as a chain of interconnected entities, thus providing a see-through perspective of the entire

business. It holds untapped sources of competitive advantage for organization that need to get their products or services to the market in competition from other organizations. (Mohanty, and Deshmukh, 2009)

2-3 Supply Chain Dimensions

The role of supply chain is widely recognized as being a critical determinant in the success and survival of both manufacturing and service organizations in today's competitive environment, and thus, has focused attention on its effectiveness. In a number of organizations, cost-effective supply chain is a matter of survival. The globalization of some sources makes it essential that the professional dimension is improved and regarded as a key element in the preparation of company or organization strategies (Quayle, 1998; Beamon, 1999).

Supply chain is also seen as a source of competitive advantage (Karen,2010; Douglas and Judge, 2001), innovation change (Singh and Smith, 2004), and new organizational culture (Irani et al., 2004). Any decline in customer satisfaction due to poor service quality would be a serious cause of organizational failure.

SCM is a philosophy and presents a business system that companies should adopt to achieve organizational excellence. There is a perception that large organizations have traditionally led the way in the implementation of modern management; the smaller ones always being followers and have lagged behind. Literatures survey showed that the majority of SMEs addressed supply chain issues partially and informally.

In more recent years the importance of supply chain management to the smaller firm has become a significantly recognized. They participate in value creating activities, especially for larger firms. They supply raw materials, produce products, and distribute finished goods to customers. Through their efforts, SMEs have significant impacts on supply chain processes (Huin et al., 2002). SMEs are often suppliers of goods and services to larger organizations. Increasingly, they have felt the impact of the quality programs imposed on them. The lack of product quality from SMEs adversely affects the

competitive ability of the larger organizations. Because of this reason, the larger companies have insisted that their small suppliers adopt TQM of their own (Barrier, 1992; Ghobadian and Gallear, 1996).

Supply chain dimensions are those dimensions which are mandatory to the success of any organization, in the sense that, if objectives associated with the dimensions are not achieved, the organization will fail. In the context of world class strategy, supply chain management dimensions represent the essential component without which a strategy stands little chance of success. SCM dimension is proposed to be a multi-dimensional concept, and hence viewed as a more comprehensive concept than the narrower view (the supplier side, the internal side or the customer side) taken in most prior research.

Supply chain dimensions have been well researched over the years by different authors (Veera et. al., 2011). However, much of the current theoretical/ empirical research in SCM dimensions focuses on only the upstream or downstream side of the supply chain, or certain aspects/perspectives of SCM (Shah et. al., 2002).Topics such as supplier selection, supplier involvement, and manufacturing performance (Choi & Hartley, 1996; Vonderembse & Tracey, 1999), the influence of supplier alliances on the organization (Stuart, 1997), success factors in strategic supplier alliances (Monczka, Morgan, 1997; Narasimhan, Jayaram, 1998), supplier management orientation and supplier/buyer performance (Shin et. al., 2000), the role of relationships with suppliers in improving supplier responsiveness(Handfield, and Bechtel, 2002), and the antecedence and consequences of buyer–supplier relationship (Chen, and Paulraj, 2004), have been researched on the supplier side.

Studies such as those by Korpela (Korpela, et al.,2001), Kisperska (Kisperska et al., 2010), and Alvarado and Kotzab (Alvarado and Kotzab, 2001), focus on the downstream linkages between manufacturers and retailers. Also, much of the current empirical research focuses on certain aspect of the internal supply chain, such as total quality management dimensions (Tan et al., 2002), internal integration (Pagell, 2004), agile/lean manufacturing (McIvor, 2001), and postponement (Naylor et al., 1999).

Injazz and Antony (2004) reviewed over 400 articles from the diverse disciplines which made their study may be the most comprehensive analysis of the multidisciplinary, wide-ranging research on SCM. The result is a set of reliable, valid, and uni-dimensional measurements that can be subsequently used in different contexts to refine or extend conceptualization and measurements or to test various theoretical models, paving the way for theory building in SCM.

In the following section the researcher will deeply study and discuss the main components of supply chain dimensions which believed to be a must in any supply chain structure. The discussion starts with manufacturing strategy followed by supplier partnership strategy, customer relation strategy, and information sharing in supply chain, logistics, and supply chain performance measurement. Theses component or dimensions will also be the base for survey questioners as presented in chapter five.

2-3-1 Manufacturing Strategy

Many firms in the supply chain are involved in manufacturing products. Whereas almost all business firms are engaged in procurement and market distribution operations manufacturers add value by converting raw materials into consumer or industries products. They create value by producing and marketing product service bundles to either end customers or intermediate members of the supply chain. For example retailers purchase a wide range of product from varied manufacturers to create an appealing assortment for consumers. This section reviews Manufacturing Strategies (MS) as important part of supply chain management. The objective is to identify its role and content.

Many definitions have been given for manufacturing strategy. According to Skinner (1969), manufacturing strategy refers to exploiting certain properties of the manufacturing function as a competitive weapon. Swami dass and Newell (1987) agreed with the previous definition and defined manufacturing strategy as a tool for effective use of manufacturing strength as a competitive weapon for achievement of business and corporate goals. These definitions looked at MS as a tool to achieve a company strategy. While, Hayes and

Wheelwright (1985) have defined manufacturing strategy as a consistent pattern of decision making in the manufacturing function which is linked to the business strategy. Hill (1987) stated that MS represents a coordinated approach, which strives to achieve consistency between functional capabilities and policies for success in the marketplace. Cox and Blackstone (1998) defined MS as "a collective pattern of decisions that acts upon the formulation and deployment of manufacturing resources. These definitions provide new understanding for MS. It coordinates different functions for strategy achieving.

I- The Role of Manufacturing Strategy

Manufacturing strategy can be vitally important in two ways. First, it can be reactive – but central – to the implementation of an already devised business strategy. This implementation would be seen in key areas such as quality, manufacturing processes, investment requirements, skills audits, capacity requirements, inventory management throughout the supply chain and new product innovation. In this concept, manufacturing's role is important in providing "strategic fit" (Hayes and Pisano, 1996; Johnson and Scholes, 1993) in focusing efforts and resources (Platts, 1993) so that manufacturing strategy is consistent with, and helps to support, the already devised business strategy (Miller and Roth, 1994).

Second, manufacturing strategy can be seen as proactive whereby manufacturing is one of a number of core capabilities/competencies which can be exploited and used to create new opportunities and to target new market (Hayes, 1985). In this approach, manufacturing's contribution would be central to the planning stages of business strategy (Mills *et al.*, 1995). Such an approach equates with stage four of Hayes and Wheelwright's (1984) model whereby manufacturing's role is central in creating strategies to gain competitive advantage. As Hayes and Pisano (1996) conclude, this approach has profound effect on the link between manufacturing and business strategies.

II-Manufacturing Strategy Content

While there may be distinction in the literature between corporate strategy, business strategy and functional strategy the three are not mutually exclusive and will link in the implementation of a particular strategy (Mills *et. al.*, 1995). The phrase "manufacturing strategy" remains noticeable by its absence in mainstream literature on "strategy" (Brown, 1996). The possibility that there might be a manufacturing strategy comes, for some companies, as a surprise (Clark and Hayes, 1988; Hayes and Wheelwright, 1984). In manufacturing literature, the actual explicit term "manufacturing strategy" is relatively new although it can be traced back to Skinner (1969). The term has been used in manufacturing literature since (Hill, 1995; Samson, 1991; Skinner, 1985) and since the 1980s the term "manufacturing strategy" has become increasingly common.

In many manufacturing strategy literature, cost, quality, dependability and flexibility have been found the most representative of the competitive dimensions of manufacturing. A number of studies have been conducted to identify or categorize manufacturing strategy content. Stobaugh and Telesio (1983) derived three groups empirically: cost, technology and market-driven strategies. Similar work has been conducted by Miller and Roth (1994), who have developed taxonomy of manufacturing strategies.

Fine and Hax (1985) examined four principal content issues – cost, quality, delivery, and flexibility. Meyer and Ferdows (1987) used principal component analysis to identify eight dimensions of manufacturing strategy including quality, flexibility, product-process adjustments, and the role of the workforce. These dimensions correspond to specific content issues.

One of the best-formulated approaches is that of Hill (1993). He argues that in each market in which the company operates it should identify those criteria that win orders against the competition. His order-winning criteria include price, delivery, quality, product design and variety. Similar sets of criteria or priorities have been developed by most writers in manufacturing strategy.

Platts and Gregory (1992) in their manufacturing strategy audit, look at the market requirements: delivery lead-time, reliability, features, quality, and flexibility of design, volume and price. Garvin (1993) in proposing strategic manufacturing initiative (SMI) decomposed five strategic priorities namely; cost, quality, delivery, flexibility, and service into thirty six items. His list is considered one of the most comprehensive lists in literature.

A listing of the content issues addressed by different study appears in Table 2-2

Table 2-2 Manufacturing Strategy contents

AUTHORS	COST	QUALITY	FLEXIBILITY	DEPENDABILITY
De *Meyer and*Ferdows 1987[9]			X	
De Meyer *et* al. 1989[10]	x	x		
De Meyer and Ferdows 1991 [11]	x	x		x
De Meyer and Ferdows 1991[121		x		
Ferdows*et* at 1986[13]		x		
Ferdows and Lindberg 1987[14]			X	
Ferdows and		x		

De Meyer 1990[15]				
Fine and Hax1985[16]	x	x	X	x
Galbraith 1990[17]			X	
Horte*et* al. 1987[19]		x		x
Horte*et* al. 1991 [20]			X	x
Lindberg *et* al.1988[21]				x
Lindberg 1990[22]			X	
Lindberg and Trygg 1991[231				x
Reitsperger and Daniel 1990[25]		x		
Schroeder *et* al.1989[29]			X	
Utterback and Abernathy 1975[33				

Source: Elliott D. et al., (1994)

The following is the study of the main manufacturing strategy content ; cost, quality, delivery and flexibility.

1- Cost

Total Manufacturing Cost (TMC) is considered a vital element of manufacturing strategy. It consists of design/ procurement /production/, inventory/ warehousing, and transportation. All of the above costs are impacted by manufacturing strategy. As such, TMC represents the foundation for formulating a market distribution strategy.

Total cost of manufacturing primarily determines the cost competitiveness of products. As such, a firm tries to reduce manufacturing costs. To do so, the cost processes involved in producing a product are to be well calculated. Design is the prime factor in determining what the product costs will be with anything between 70 and 80 per cent of product cost being determined at the design stage Mills (1991). Similarly, product cost is also dependent on the level of product complexity, with Hagel (1988) considering cost to be a direct exponential function of complexity.

The manufacturing cost and procurement declines as quantity increases, reflecting economy of scale associated with make-to-plan (MTP). Inventory and warehousing costs increase, reflecting the impact of larger manufacturing lot sizes. Transportation cost per unit decreases as a result of shipment consolidation. In contrast, Make-To-Order (MTO) strategies reflect high per unit manufacturing and procurement costs which are, in part, offset by lower inventory and warehousing costs. In the MTO strategy, transportation cost per unit is higher, reflecting small shipment and/or premium transportation. The TMC results from functional integration of manufacturing, procurement, and logistics. From a perspective of integrated management it is important for manufacturing firms to design a supply chain strategy that achieves lowest total cost of manufacturing across the entire process.

2- Quality

It is well recognize that quality is essential for success in both large and small manufacturing and service organizations alike. Quality is always being a major consideration for manufacturing strategy. Failing such consideration, the business will flounder and time spent planning, devising and articulating a particular strategy will be futile. In addition, the success of the implementation of a particular strategy will depend, to a large extent, on the capability of the plant in quality.

Product quality is one of the most important factors for a manufacturing firm to be successful in the world market. It is argued that a quality image, once obtained, can improve a firm's ability to compete, as well as its long-term opportunity for success (Pfau, 1989). DuBrin (1995) stated that business strategy development must place a high priority on product quality, which is a crucial hinge for business success or failure in today's quality performance- oriented markets. Therefore, product quality has become a major business strategy (Feigenbaum, 1991).

The strategic importance of quality is highlighted by the fact that quality is one of the major distinguishing features in manufacturing performance between the West and Japan between 1970 and 1990 (Womack *et. al.*, 1990). The Japanese distinguished their products not only by the cost but also by their low incidence of defects, their reliability, and their durability. The weapons that Japanese used to beat the West products were quality, cycle time, and flexibility.

It has been well recognized that, for SMEs to survive and succeed in very intensive market competition, they should consider quality as one of the main block in their business strategy (Switzer, 2002; Opasanont, 2000). Quality is, therefore, as important as low-cost and innovation strategies (Hay, 1996), as a business strategy to win in an aggressive market situation against a number of global competitors.

Benjamasuthin et. al., (2001), in his study concluded that most exporting Thai manufacturing SMEs preferred to use a quality rather than a price strategy. This

showed a positive attitude by Thai manufacturing SMEs which were mostly interested in quality and tended to implement quality concept as their strategy rather than reduce price. The report on a survey by Lascelles and Dale (1990), carried out on seventy four U.K. executives concluded that more than 85% of leading CEOs in Europe considered the management of product quality to be one of the top priorities for their organization. The quality revolution had brought pressure to bear on developing and under developed countries too. Ahire et. al. (1996) suggested that improving product quality be the prime objective of a firm's quality management efforts, and product quality be used as a primary indicator of the firm's quality efforts.

The quality models are accompanied with well proven quality tools. These are many quality tools that are used to improve product quality. These tools like; Pareto Chart, Cause and Effect, Histogram, Flow Chart, Check Sheet, Scatter Plot, Statistical Process Control, allow us to provide this essential direction and they are shown in Figure 2-1.

In summary, it is important to realize that services and products will only be required as long as they meet the customer's demands. The only other sure thing is that tomorrow's demands will be higher than those of yesterday and that, rather than being a 'winner', excellence will only be a ticket to the game.

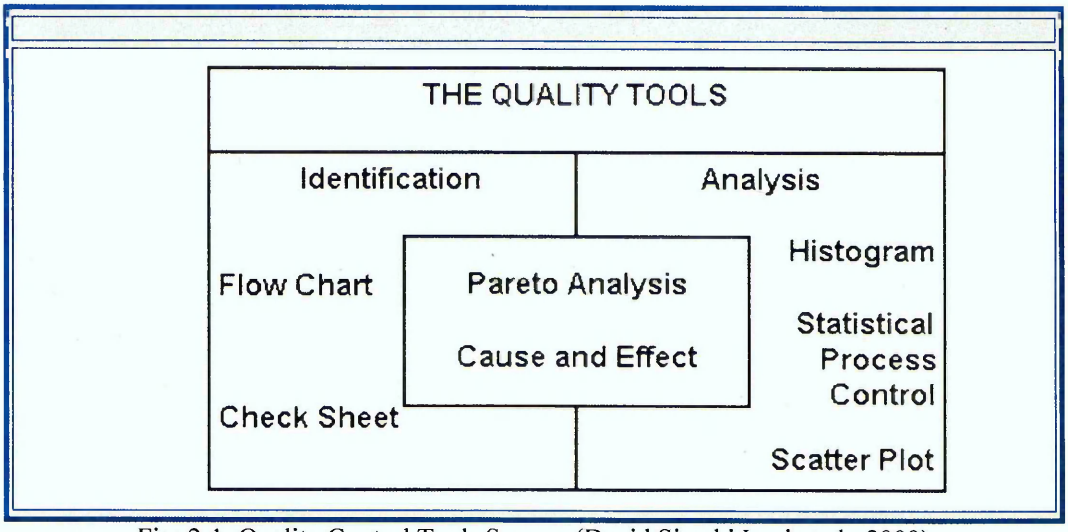

Fig: 2-1: Quality Control Tools Source: (David Simchi Levi et al., 2000)

3- Delivery

Today more than ever—with the globalization delivering raw material, spare parts or finished product on time within the supply chain is critical for suppliers, plants and dealers. Order-to-delivery (OTD) time is something to be watched very closely to meet each market's specific demands.

In today's competitive business environment, customers require dependable on-time delivery from their suppliers. In the short term, delivery deviations – the earliness and lateness from the targeted delivery date - must be analyzed, as both early and late deliveries are disruptive to supply chains. Early and late deliveries introduce waste in the form of excess cost into the supply chain; early deliveries contribute to excess inventory holding costs, while late deliveries may contribute to production stoppages costs and loss of goodwill. Burt (1989) notes that reductions in early deliveries reduced inventory holding costs at Hewlett-Packard by $9 million. In the automotive industry Saturn Levies fines of $500 per minute against suppliers who cause production line stoppages (Frame, 1992). Chrysler fines suppliers $32,000 per hour when an order is late (Russell and Taylor, 1998). When delivery is made on time, however, the costs incurred by the supplier are considered to be "normal costs" and no penalty cost is incurred.

On time delivery is an important part of a supply chain case. That is because it directly impacts customers' satisfaction; hence, measuring and improving delivery is always desirable to increase competitiveness.

Recent empirical research has identified delivery performance as a key management concern among supply chain practitioners (Lockamy and McCormack, 2004; Vachon and Klassen, 2002; Verma and Pullman, 1998). Gunasekaran *et. al.*, (2001) presented a conceptual framework for defining delivery performance in supply chain management. Within the structure, delivery performance is classified as a strategic level supply chain performance measure.

Short delivery lead times can be an important marketing factor, with any reduction in the delivery time increasing sales. Thus attention is often focused on reducing the manufacturing lead time either through the use of advanced manufacturing technology (AMT) or by Japanese approaches (JIT). Yet the overall delivery lead time can also be reduced by a compression of the pre-manufacturing activities.

There are many factors that might affect the delivery performance of a company. Complexity of a product, manufacturing technology, logistic capability, and information technology affect product delivery. To protect against untimely deliveries, supply chain managers often inflate inventory and production flow time buffers. Correcting untimely deliveries in this fashion represents a reactive management style that may introduce additional sources of variance into the supply chain, and further contribute to the bullwhip effect. In the long run, delivery performance is an important component in the overall continuous improvement of supply chain operations.

4- Flexibility

As competition intensified so did the uncertain business environment. For supply chain to be effective and manage their business risk, it should consider manufacturing flexibility within their strategy. Flexibility in supply chains is the possibility to respond to short term changes in demand or supply situations of other external disruptions together with the adjustment to strategic and structural shifts in the environment of the supply chain. Flexibility thus combines agility and adaptability (Lee, 2004).

Slack (1991) concluded in his study the importance of flexibility for the supply chain performance. Flexibility in supply chains may well represent a potential source to improve the company's efficiency and may be a significant measure of supply chain performance (Vickery *et. al.*, 1999). Efficient supply chain flexibility can increase the organization's ability to adapt to the changes in its business environment. The adaptation of the "many suppliers" dimension could increase flexibility generating alternative sourcing for procurement by reducing supply chain risks. Building long-term partnership relations with suppliers and customers also helps to improve the flexibility of the supply chain by creating a mutual understanding among the members (Chang et.

al., 2005). Holding safety stock and sub-contracting could dampen down supply and demand chains uncertainties through delivering from inventory and/or purchasing sub-contracted resources. Outsourcing and 3PL are two of the frequently used SCM dimensions by firms to provide flexibility to internal capacity to ring fence their resources for the core activities.

Supply chain flexibility is defined to encompass those flexibility dimensions that directly impact a firm's customers and are the shared responsibility of two or more functions along the supply chain, whether internal (marketing, manufacturing) or external (suppliers, channel members) to the firm. There are very few studies on supply chain flexibility and there are even fewer studies about the relationship between supply chain flexibility and firm performance, which offers a research opportunity (Dangayach and Deshmukh, 2001).

2-3-2 Supplier Partnership Strategy

Strategic supplier partnership is defined as "the long term relationship between the organization and its suppliers. It is designed to leverage the strategic and operational capabilities of individual participating organizations to help them achieve significant ongoing benefits" (Li et. al., 2006; Eamonn et. al., 2010). Strategic partnerships between organizations promote shared benefits and ongoing collaboration in key strategic areas like technology, products, and markets (Yoshino and Rangan, 1995). For instance, Taiwan Semiconductor Manufacturing Company (TSMC), the world's largest semiconductor foundry, gives suppliers and customers proprietary tools, data, and models so they can execute design and engineering changes quickly and accurately. Porter (1980) suggested that co-operation can enable partners to achieve a stronger position together than they can alone. Metzger et. al. (2001) suggests that the key to effective management in the global environment is to have closer relationships with suppliers. The purpose of strategic partnerships is to enable and enhance coordination between partners in operations, R & D, product launching, and the like. (Fulconis and Pache, 2005)

I- Success Factors of Supplier Partnership Strategy

The success of supplier partnership strategy depends on some of the following six factors:

a) Trust in partnership Strategy
b) Commitment in partnership strategy
c) Supplier selection.
d) Supplier involvement
e) Supplier evaluation, and
f) Supplier-based reduction strategy

All these factors are discussed in detail hereunder;

a)- Trust in Partnership Strategy

In the new era of business corporate environment, companies are required to be responsible not only for their own performance but also for all their partners in the supply chain (Sarkis, 2001). Trust is often emphasized as the most important issue for managing long-term relationships and cooperation, between parties (Min and Mentzer, 2000). Trust exists when one party has confidence in partner's reliability and integrity in a collaborative exchange (Zineldin and Jonsson, 2000).

The development of trust-based internal and external relationships is an important source of competitive advantage for the successful supply chain strategy (Huff & Kelly, 2003; Shockley-Zalabak, Ellis, &Winograd, 2000). This is especially true for companies operating in the global market because of increased risks and uncertainties, and differences in culture, values, goals, policies, and dimensions of partners in the supply chain (Huff & Kelly, 2003). Accordingly, trust is defined as the willingness of a partner (the one who trusts) to be vulnerable to the actions of the other (the trustee) based on the expectation that the trustee will not act in a harmful way towards his business partner (Mayer et. al., 1995). Another source defines trust as "a willingness to rely on an exchange partner in whom one has confidence" (Moorman et. al., 1993). Anderson and Narus (1990) also focus on the perceived outcomes of trust when defining trust as "... the firm's belief that another company will perform actions that will result to positive outcomes for the firm as well as to not take unexpected actions that will result to

negative outcomes".

For Moorman et. al., (1993), trust does exist if this expectation is associated with a behavioral intention. Also, a minimum level of risk or uncertainty is necessary to trust. Without it, there is no need to develop trust. Trust is a non-contractible attribute of a relationship. Barney and Hansen (1994) have argued that trust can be a source of competitive advantage for firms. Buyers will be reluctant to replace trusted suppliers, given that trust-building occurs over a period of time and involves substantial costs.

b)- Commitment in Partnership Strategy

Researchers have been claiming that competitive success would depend on collaborative supply chain (Christopher, and Ryals, 1999; Harps, and Hansen, 2000). The key for effective supply chain collaborative breakthroughs is to establish strong managerial commitment (Akkermans, et al., 1999; Lummus, et al., 1998). Morgan, and Hunt (1994) argued that "... when both commitment and trust – not just one or the other – present, they produce outcomes that promote efficiency, productivity and effectiveness".

Commitment provides a foundation for the development of effective supply chain integration. Commitment must come from all levels of the organization as well as from key channel "partners." Top management, all the way to the CEO, must endorse SCM initiatives and provide the necessary resources (Marien, 2000; Stalk et al., 1992).

Supply chain partners must also exercise their role in sharing commitment between channels. Therefore, it is needless to say, any enduring business transactions among supply chain partners require commitment by two parties in order to achieve their common supply chain goals. Without commitment, business relationship and subsequent transactions become fragile and vulnerable. Accordingly, enduring commitment is a basic requirement for successful supply chain implementation.

The concept of commitment is defined as a desire to maintain a relationship (Moorman, et al., 1992; Morgan and Hunt 1994). Sometimes it is conceptualized as a "pledge of continuity" from one party to another (Dwyer, et. al., 1987). This definition considers commitment as cornerstone to all the relational exchanges between the firm and its

various patterns.

Drawing on previous studies it was argued that SCM commitment was found to be one of the most influential factors on business process SCM integration (Wann et al., 2004). Marketing scholars have identified customers' commitment as a central relationship survival (Garbarino and Johnson 1999; Gundlach, et al., 1995) and performance (Kumar et al., 1994; Noordewier et al., 1990). The fundamental principles upon which relationship marketing is based are mutual value creation, trust, and commitment. Commitment encourages the channel partner firms to resist apparently attractive short-term alternatives in favor of the expected long-term benefits of staying with existing partners (Anderson et al., 1994; Morgan and Hunt, 1994) and to achieve high levels of customer satisfaction through collaboration of the parties involved (Payne et al., 1995).

Commitment and trust are a "key" because they encourage marketers to (1) work at preserving relationship investments by cooperating with exchange partners, (2) resist attractive short-term alternatives in favor of the expected long-term benefits of staying with existing partners, and (3) view potentially high-risk actions as being prudent because of the belief that their partners will not act opportunistically. Therefore, when both trust and commitment are present, they produce outcomes that promote efficiency, productivity, and effectiveness. In short, commitment and trust lead directly to cooperative behaviors that are conducive to relationship marketing success.

Commitment is an important goal for channel and relationship managers (Dwyer et al., 1987). It is essential to developing and maintaining successful relational exchange (Gundlach, et al., 1995). For example, manufacturers require commitment from distributors and retailers in order to carry out coordinated marketing programs (Goodman, and Dion, 2001). More generally, commitment enhances the efficiency and effectiveness of marketing relationships (Morgan & Hunt, 1994). Commitment increases the efficiency of exchange relationships by establishing relational norms that include flexibility and solidarity (Gundlach, & Murphy, 1993). Commitment enhances effectiveness because the parties can maximize their returns over a series of transactions

(Mohr & Spekman, 1994). Commitment is of critical importance in organizational buying behavior and can lead to important outcomes such as decreased customer turnover (Porter et al., 1974) and higher motivation (Farrell and Rusbult, 1981). Empirical research indicates that commitment predicts willingness to cooperate, propensity to leave, and acquiescence and compliance (Morgan & Hunt, 1994). It is clear that commitment is an important construct both theoretically and for practicing managers.

Affective commitment expresses the extent to which customers like to maintain their relationship with their supplier. Affective commitment is based on a general positive feeling towards the exchange partner (Konovsky, Cropanzan, 1991). Calculative commitment, a negatively oriented type of motivation, refers to a firm's motivation to continue the relationship because it cannot easily replace its current partner and because it cannot obtain the same resources and outcomes outside.

Whereas, Fawcett et. al., (2006) have identified four types of commitment which are vital to SCM implementation: top management commitment, broad-based functional support, channel support, and a commitment to infrastructural development and governance.

c)- Supplier Selection

Strategic sourcing has a key role to play in supply chain competitiveness. It is a core process in the larger function of supply chain management. Strategic sourcing is a disciplined approach that improves the value the firm receives from the suppliers. There are four principles that set apart strategic sourcing from traditional tactical purchasing:

1- Define the total value of the relationship between the purchaser and suppliers,
2- Develop solution based on deep understanding of the supplier's economics and business dynamics,
3- Use differentiated purchasing tactics in order to optimize the economic relationship for both purchaser and suppliers
4- Implement the required changes in the organization so the purchaser achieves not only a near-term measurable performance improvement but also the ability to

continuously improve.

In the strategic procurement project, the cross function team is a pre-requisite and implementation is a four step process detailed as follows:

1- Research the industry
2- Evaluate the suppliers capabilities
3- Structure the relationship with suppliers
4- Develop action plan to build required infrastructure

The growing intensity of market competition forces organizations to focus on supply chain management to cope with highly increasing competition. One strategy for effective supply chain is to reduce the vertical range of manufacture and concentrate exclusively on the core capabilities. At the same time, the reduction of the manufacturing depth leads to an increase of the proportion of purchased parts and consequently increases the dependency on suppliers (Marons and Bruckner, 1998).

Therefore, the success of a company is determined to a greater degree by the abilities of its supplier's selection. Suppliers have to be selected carefully, as they can have a very positive or a very adverse impact on the overall performance of the organization.

The importance of supplier selection has been stressed in the literature. Some previous reviews of the subject have been presented by Weber et al. (1991) and De Boer et al., (2001). Ellram (1990) categorized supplier selection research into two different schemes: descriptive, which describing an actual dimension, or prescriptive, which is modelling how suppliers should be selected given with a set of selection criteria. Vonderembse et al., (1999) investigated the extent to which supplier selection criteria and supplier involvement are used by manufacturers. The study provides support for the claim that firms employing these dimensions have enhanced supplier and manufacturing performance. De Boer et al. (2001) studied the supplier selection literature in a more comprehensive manner. They extended previous reviews by classifying the existing literature in a framework. This framework recognized several decision-making steps in the supplier selection process prior to the ultimate choice step. In addition, De Boer et

al. (2001) framework classified the supplier selection literature according to different purchasing situations such as first-time buys, modified re-buys, and straight re-buys.

A research work by Chin-Chun et. al., (2006) suggests that a number of themes emerge from prior literature, which evolved primarily from the purchasing and supply management domain. Much of the early work that focuses on the purchase environment to take a transactional approach to study the underlying criteria used to select suppliers in different purchase situations (Ellram, 1990; Swift, 1995).

The second theme focuses on the strategic issues and examines the strategic implications of supplier selection. The advent of supply chain management as a business paradigm has fundamentally reshaped the role of supplier selection. Manufacturing firms are shifting away from vertical integration toward developing smaller, leaner organizations that focus on exploiting core competencies (Prahalad and Hamel, 1990).(This has led to companies reducing the size of their supplier bases so they can more effectively manage relationships with, and more efficiently leverage capabilities and technologies of strategic suppliers (Tully, 1995).) It has also led to traditional adversarial buyer-supplier relationships being gradually replaced with mutually beneficial partnership relationships; particularly with strategically important suppliers who can positively affect buyer's competencies (Copacino 1996; Mason, 1996).The third, more recent stream of research focuses on the performance issues and examines the impact of supplier selection on measures of the buying firm's performance. Of particular significance is the fact that not only does supplier selection impact both manufacturing and business performance, more commonly used criteria such as cost and quality may have less impact on performance than intangible criteria (Kannan et al., 2002). The extensive list of supplier selection research makes it a daunting task to summarize the findings of the literature. Chin-Chun et. al., (2006) provided a summary of the previous research and their findings.

To build more effective relationship with suppliers, organizations are using supplier selection criteria to strengthen the selection process. It is indicated that the supplier selection criteria is changing with the new challenge to select suppliers who can add long term value to the manufacturer (Lemke et al., 2000).

Relying on a single criterion makes the supplier selection process risky. Therefore, a multi-criteria approach is recommended. Dickson (1966), in his seminal work, identified 50 factors which represented characteristics of vendor performance. His empirical investigation later reduced the total criteria to 23.Weber et al. (1991) reviewed and classified 74 articles that have appeared in the literature since 1966 in terms of the particular criteria mentioned in each article, the purchasing environment, and the decision techniques used to select the best suppliers. In 1991, Weber et al. (1991) reprioritized the 23 criteria identified by Dickson based on 74 articles that have appeared in the literature since 1966 (see Table2-3).

Table: 2-3 Supplier Selection Criteria

Supplier Selection Criteria		
RANK		**CRITERIA**
Dickson (1966)	**Weber et al. (1991)**	
1	3	Quality
2	2	Delivery
3	10	Performance History
4	23	Warranties and Claim Policies
5	4	Production Facilities and Capabilities
6	1	Net Price
7	6	Technical Capability
8	9	Financial Position

9	16	Bidding Procedural Compliance
10	18	Communication System
11	8	Reputation and Position in Industry
12	21	Desire for Business
13	7	Management and Organization
14	14	Operational Controls
15	11	Repair Service
16	12	Attitude
17	20	Impression
18	13	Packaging Ability
19	17	Labor Relations Records
20	5	Geographical Location
21	22	Amount of Past Business
22	15	Training Aids
23	19	Reciprocal Arrangements

Source: Dickson (1966) and Weber et al. (1991)

With the growing trend for longer-term collaborative relationships, a new set of supplier selection criteria began to evolve which consisted not only some of the traditional factors used in previous studies, but also criteria which are longer term and more

subjective in nature. Ellram (1987) identified a number of issues as important in selecting suppliers with which to establish partnership relations. A review of these factors indicated under the category technology issues, the supplier's design capabilities is mentioned, but more from an overall qualitative impression rather than providing specific variables to consider.

The selection of suppliers is critical for several reasons. First, the trend toward "Just- in-Time" manufacturing dimensions has resulted in a supply base reduction (Pearson and Ellram, 1995). Second, the result is due to resource scarcity. There is a need for greater interaction between the buyer and supplier. Third, many firms involve their suppliers early in the planning process so that they are able to deliver superior value to their customers (Trent and Monczka, 1998). In order to release products quickly, supplier selection occurs at the front end of the program, long before the specifications are laid out. P. Humphreys et al., (2007) listed a number of reasons for this trend, including rising global competition, more rapid technical change and the need for the faster development of products with higher quality and reliability. It is virtually impossible for any firm to possess all the technical expertise needed to develop a complex product.

Effective supplier selection enables manufacturers to achieve the four dimensions of customer satisfaction: competitive pricing, product quality, product variety, and delivery service (Morgan, 1996; Poirier, 1999). Empirical research has shown that manufacturing companies that enrich their capacity to satisfy their customers in respect to any of these four dimensions enhance their level of overall business performance (Tracey, 1998; Tracey *et. al.*, 2000). Therefore, it is possible that effective selection and evaluation of suppliers and promoting their involvement in critical supplier chain activities will result to improve firm performance via enhanced customer satisfaction.

d)- Supplier Involvement

Numerous scholars have argued that buyers can benefit from involving suppliers in the development process rather than working independently when it comes to market timing of new products, product quality, development cost, and product cost (Handfield, et. al.,1999). In practice, supplier involvement includes a wide range of collaboration

activities such as Just-In-Time (JIT), delivery, quality improvement, new product design, green purchasing and so on (Krause, 1997). Empirical evidence, however, has provided mixed supports for the proposed positive effects of supplier involvement in product development. Research in the late 1980s initially confirmed positive effects of supplier involvement (Clark, 1989).

The focus of most researches, prior to the 1990s, was on supplier development, selection, and certification. Later to that date, it was found out that a large body of literature focusing on supplier-buyer collaboration, mostly in terms of supplier-buyer relationships (Veloso and Fixon, 2001), trust in supplier relations (Sako and Helper, 1998), contractual aspects (Cox, 1996), organizational learning (Kogut and Zander, 1992) and collaboration between manufacturers and their suppliers in the development of new parts or end products (Bozdogan et al., 1998). Supplier involvement and ESI (Early Supplier Involvement) is an emerging and important research area both for the research community and practitioners (Takeishi 2001). Empirical research (Narasimhan, 2000) provides evidence that supplier involvement on product design teams and in continuous improvement programs is a source of meaningful competitive advantage because it enhances the manufacturer's quality, responsiveness, flexibility, and time-saving capabilities.

Over the last decade, there is an increasing interest on the notion of Early Supplier Involvement (ESI) in New Product Development (NPD) both within the practitioners and academic communities. For instance, Handfield et al. (1999) propose a process model for reaching consensus on suppliers integrate into new product development project. They also provide a framework to facilitate in sourcing and outsourcing decisions. Ragatz et. al., (2002) have developed a conceptual model to test the effect of elements of the supplier integration process on cost, quality, and NPD time, under conditions of technology uncertainty.

Rresearchers have found that a number of benefits are attained through early supplier involvement. Firstly, incorporating suppliers on project teams enhances the information and expertise regarding new ideas and technology (Smith, Reinertsen, 1991). In

addition, it allows early identification of potential problems, thus improving the quality of the final product, eliminating rework and reducing costs (Handfield, 1994; Dow, 1997; Meyer, 1993). Secondly, early supplier involvement provides a possible route for outsourcing that can reduce the internal complexity of projects (Brown, Eisenhard, 1995) and provides for extra resources which can lead to reduction in the critical path of the project (Clark, and Fujimoto 1991). Thirdly, it can improve communication and information exchange that reduces delays and ensures that the project is completed on time. Finally, it can lead to improve buyer–supplier relationships, since suppliers internalise project concerns and subsequently leads to smoother working relationships on future projects (Meyer, 1993).

Three important strategic aspects of early supplier involvement have been identified in the literature (Hartley et al., 1997;Ragatz et al., 2002; Handfield, Petersen, 2002); Liker et al., 1996), consisting the of extent of involvement during the product development phases, the nature of buyer–supplier relationships and the degree of information exchange.

In respect to the extent of involvement during the product development phases, several researchers have investigated the design process, particularly in the automotive industry, and identified early supplier involvement during several phases of product development (Clark, and Fujimoto, 1991; Lamming, 1993). The opportunity to improve product design performance by involving suppliers in the product development process identifies a definite need to understand better the influence of buyer–supplier relationships on ESI. Birou and Fawcett (1994) suggest that environments which are conducive to highly co-operative relationships between buyers and suppliers are more likely to lead to supplier involvement.

By contrast, highly confrontational buyer–supplier relationships are less likely to result in the early inclusion of suppliers in the product development process.

Studies of the effect of buyer–supplier communication on the product development process have found mixed results. Several empirical studies have failed to confirm a relationship between communication with suppliers and product development success (Katz, Tushman, 1979). Just recently, Wynstra et al., (2000) in a series of case studies involving a number of multinational corporations, it was found that in all instances, communication problems were identified during ESI.

Typical issues are mentioned such as, poor guidelines for supplier involvement, poor implementation of integrating suppliers with company systems, and standardization efforts hindered by outdated information. Liker et al., (1998) identified technical communication as another area which caused problems during ESI. Richeson et al. (1995) have identified six areas where enhanced communication can take place: (a) freely exchanged cost, schedule, and quality control information, (b) elimination of purchase orders for each shipment, (c) involving suppliers in the development of design specilcations, (d) the formation of problem-solving task forces, (e) supplier and manufacturer plant visits, and (f) electronic data interchange (EDI).

Researchers have tried to unveil the factors determining the success or failure of supplier involvement in product development. Issues like defining and establishing objectives, processes, and procedures for directing the involvement of suppliers and defining the right organizational coordination mechanisms (Bruce et al., 1995; Ragatz et al., 1997) are considered as critical success factors in overcoming major differences in style, priorities, and motivation between the organizations involved (Tabrizi and Walleigh, 1997). In this context, Takeishi (2001) refers to integrative capabilities, such as architectural knowledge, integrated problem- solving, and internal coordination, as critical factors determining the quality of the design outcome of joint development effort. Another contribution in the same line is made by Brown and Eisenhardt (1995).

They provide a summary of the key variables from the literature, which include:

- Team composition, team organisation of work and group processes,
- Project leadership and senior management support,
- Product concept effectiveness,
- Marketing issues, and
- Supplier and customer integration

In addition, Wynstra, et al., (2001) contribute to this context by providing three critical issues facing the manufacturer in achieving effective and efficient supplier involvement:

- Identifying specific processes and tasks that need to be carried out, aimed at the integration of product development and sourcing processes,
- Forming an organisation that supports the execution of such tasks, and finally,
- Staffing the organisation with people that have the right commercial, technical and social skills.

e)- Suppliers Evaluation

After developing a comprehensive list of potential suppliers, the supply manager's next step is to evaluate each prospective supplier individually. The type of evaluation required to determine supplier capability and capacity, criticality, complexity, and Dollars value of the purchase to be made. The evaluation also varies with the supply manager's or sourcing team's knowledge of the firms being considered for the order.

In some cases, an evaluation is unnecessary. For many uncomplicated, low-Dollars--value purchases, an examination of basic information readily available, such as a mailing or website, is sufficient. For complex, high-Dollar-value, and perhaps critical, purchases, additional evaluation steps are necessary.

For Strategic Sourcing the following guidelines may be followed:

1. Is the supplier strategically important? If the supplier' provides a product, or access to a future product, that is critical to the buying firm's success, take the time.
2. Is the product or service being procured considered strategic? If yes, then take the time to perform the evaluation.
3. Are there other short-term alternatives available? If supply management can modify the request to allow another product, service or supplier to be quickly substituted, then they can reduce the thoroughness of the evaluations.

Steps for complex, high value, and perhaps critical, purchases can include surveys, financial condition analysis, third-party evaluators, evaluation conferences, plant visits, and selected capability analyzes. Usually surveys and an analysis of the financial condition come first. Companies that have positive survey results and *good* financial standing may require facility visits. If required, visits are followed by even more detailed analyzes of the most promising suppliers' management, quality, capacity, service, just-in-time, and information technology capabilities.

f)- Supply Base Reduction Strategy

Supply base management is one of the most strategic areas of responsibility in the purchasing and supply function in organizations. Research has supported the argument that an organization is only as good as its supply base (Reed and Walsh, 2003). Hahn (Hahn, et. al., 1990) supported this notion by stating that "without a competent supplier network, a firm's ability to compete effectively in the market can be hampered significantly". Fine (1998) emphasized the importance of an organization's supply base by stating that supply chain base is the ultimate core competency.

One important decision relating to the design of an organization's supply chain is the number of suppliers used for a given product or service (Lambert and Cooper, 2000; Talluri and Narasimhan, 2005). Consequently, gaining an understanding of the tools used

in creating and managing a supply base should be a top priority for supply management professionals. Supply base reduction is one such tool. For purposes of this research, supply base reduction is defined as the process of and activities associated with reducing the number of suppliers that an organization utilizes. While supply base optimization may involve increasing the number of suppliers used for a given product or service, supply base reduction strictly involves a decrease in the number of suppliers.

While many articles discuss the conceptual benefits of supply base reduction, very little empirical research has been done on the topic. Supply base reduction has been discussed as being a prerequisite to other purchasing strategies such as Just-In-Time (JIT) purchasing, supplier partnerships, and supplier development. However, supply base reduction implementation and the benefits that can be achieved through this purchasing strategy have not been a major research topic in the literature. Most of the coverage of supply base reduction tends to be brief and lack of specifics.

Recently, a significant shift has occurred from the traditional adversarial buyer–seller relationships to the use of a limited number of qualified suppliers (Burt, 1989). Between 1980s and 1990s, purchasing began to be viewed as key player in the corporate strategic planning process (Carlisle and Parker, 1989). Academics had too given unprecedented attention to strategic purchasing (Gadde and Hakansson, 1993; Lamming, 1993; Ellram and Carr, 1994). The ability of purchasing to influence strategic planning has increased in a number of firms due to the rapidly changing competitive environment (Carr and Pearson, 2002), and evidence reveals that purchasing is increasingly seen as a strategic weapon to establish cooperative supplier relationships to enhance a firm's competitive stance (Carr and Smeltzer, 1999). Thus, contemporary purchasing is now best recognized as a fundamental unit of SCM (Gadde and Hakansson, 1994; Fung, 1999).

One important decision relating to the design of an effective supply chain management is the supplier relationship strategy. Supply base reduction was found to be one component of this strategy. Traditionally, most organizations have engaged many suppliers in order to reduce prices (Rittenberg and Tregarthen 1999). However, with new global market competition, this has been changed. Most of the organizations nowadays rely on few number of suppliers used for a given product or service (Lambert

and Cooper 2000; Talluri and Narasimhan 2005).

This has been viewed as a performance characteristic of a good supply management orientation (Cooper and Ellram 1993; Shin, Collier and Wilson 2000).

The necessity of reducing the supply base has been highlighted by many researchers (Dowlatshahi, 2000; Parker and Hartley, 1997; Swift, 1995). The benefits including: (1) fewer suppliers to contact in case of orders given on short notice (Fisher, 1997), (2) reduced inventory management costs (Trevelen, 1987), (3) volume consolidation and quantity discounts, (4) increased economies of scale based on order volume and the learning curve effect (Hahn et al., 1986), (5) A small supply base reduces supplier development costs (Dowlatshahi, 2000), (6) reduced logistical costs (Bozarth et al., 1998), (7) coordinated replenishment (Russell and Krajewski, 1992), (8) an improved buyer–supplier product design relationship (De Toni and Nassimbeni, 1999), (9) improved trust due to communication, (10) improved performance (Shin et al., 2000), and (11) better customer service and market penetration (St. John and Heriot, 1993). More benefits of such strategy could be found literatures.

Many world class organizations have put supply base reduction strategy in action and gained better business advantages. For examples;

Xerox

From 1981 to 1985, Xerox reduced its supplier base from 5000 to 400.1 from 1981 to 1984; net product costs were reduced by about 10 percent per year. Rejects of incoming material were reduced by 93 percent. New product development time and cost were reduced by 50 percent. Production lead times were reduced from 52 weeks to 18 weeks (Burt, 1989).

Nissan

Nissan plans to halve its worldwide supplier base to 4000 by 2002 and then leverage its increased business with the remaining suppliers to reduce prices paid by 20 percent (Magnier, 1999).

IBM

"In1993 IBM had about 4,900 production suppliers. Now about 85% of IBM's $17.1 billion in production purchases is with 50 suppliers." "Commodity councils that leverage IBM purchasing worldwide have resulted in IBM sourcing parts at price[s] that are 5%–10% below industry averages." "Leveraging has had a big impact on the bottom line. In the year of 1998, little over $1.5 billion on $21 billion we spent was saved, by leveraging, negotiating, and moving business to our preferred set of suppliers'".

"All other things being equal, we would source with a supplier who has multiple capabilities and we tell them that" (Carbone, 1999).

Supply base reduction activities helped establish closer, or stronger, relationships with the suppliers that remained after such efforts. Reducing the number of suppliers allows companies to utilize long-term contracts and improve buyer-supplier communication as part of win-win relationships.

Suppliers receive several benefits as part of these win-win situations. First, supply base reduction efforts allow suppliers to receive a larger revenue base due to the increased volume being purchased through them. Second, suppliers receive the opportunity to earn additional business by bidding on new requirements that arise. Third, suppliers receive forecast and parts usage information which helps them better plan and manage their inventory levels. Fourth, suppliers are able to increase margins and be more competitive with other customers because of lower costs through volume purchases. Fifth, suppliers get detailed feedback from the buying organization that helps them improve their products or processes.

2-3-3 Customer Relationship Management

In today's business environment, organizations are experiencing an increasingly aggressive competition, from local market as well as from international market. Notably, there have been a number of signs that suggest the power of the brand – in both consumer and industrial markets – is in decline (Brady and Davis, 1993). In the new paradigm of marketing, the emphasis changes from brand value to customer value. All

that and more demand enterprises become more skilled at managing customers.

In such business scenarios, organizations worldwide need to look at customer relationship management (CRM) as a strategic approach that can help realize improved customer value and to achieve corporate goals and stakeholder returns. Customer Relationship Management (CRM) can be understood as a revolving process during which companies interact with their customers, thereby generating, aggregating, and analyzing customer data, and employing the results for service and marketing activities (Seybold, 2001).

The motivation for companies to manage their customer relationships is to increase profitability by concentrating on the economically valuable customers. From this, one can understand that the purpose of CRM is to efficiently and effectively increase the acquisition, growth and retention of profitable customers by selectively initiating, building and maintaining appropriate relationships with them.

CRM has attracted the expanded attention of practitioners and scholars. More and more companies are adopting customer-centric strategies, programs, tools, and technology for efficient and effective customer relationship management. They are realizing the need for in-depth and integrated customer knowledge in order to build close cooperative and partnering relationships with their customers.

CRM is based on the principles of Relationship Marketing (RM) which is regarded as one of the key areas of modern marketing and has generated great research interest (Sheth, 2000). Others view CRM as a paradigmatic shift in marketing (Parvatiyar and Sheth, 1997). The increased interest in 'one to one' marketing (Peppers and Rogers, 1993) raised the potential for shifting from a mass to individualize or 'one-to-one' marketing. Relationship-based approaches have been increasingly advocated over the last fifteen years (Vargo and Lusch, 2004). With its roots in RM, CRM is a relatively new management discipline. Parvitiyar and Sheth (2002) point out the two terms are often used interchangeably. Contributors to this literature emphasize the key role of multiple stakeholders (Gummesson, 1999). Others propose that RM is concerned with relationships with multiple stakeholders, while the focus of *customer* relationship management should be primarily on the customer.

I- Defining CRM

Customer Relationship Management is a word that every marketing professional thinks or assumes as a known term. However, when it comes to explaining the same each individual tends to give one's own perspective, leaving behind the dimensions and realities of various organizations implementing CRM and facing daunting tasks aside.

Agarwal (2003), in his treatise explaining the CRM concepts, identifies four ways of viewing the term CRM. They are:

- CRM is a contemporary response to the emerging climate of unprecedented customer churn, waning brand loyalty and lower profitability (Cockburn, 2000);

-CRM is central to the task of making an organization customer-centric (Gamble, Stone & Woodcock, 2006);

-CRM is the surest symbol embracing information technology in business (Gordon, 2002); and

-CRM is the most certain way to increase value to the customers and profitability to the practicing organizations (Reichheld, 1996).

The importance of CRM may be gauged from the statement of Curry and Eckerson, quoted as "the effective CRM dimensions can mean the difference between the success and failure of a business across all industries, particularly for mid-size enterprises (Curry, 2000). He concludes that in the present era more companies are seeking to understand the concept and mechanics of the CRM.

He raises the most critical question: "What is customer relationship management (CRM) all about? Is it a new jargon in our vocabulary or is it really a new paradigm?" While we try and find few answers for the same, the topics of developing a relationship with customers using the IT tools appear ubiquitously from every corner. Any cursory search on the term CRM leads to an array of IT based solutions, applications and tools and services surface, while few also voice the criticality of the database and its development and management in CRM. At any rate, the broad definition for CRM may be developed on the following lines using Agarwal's framework. 'CRM is the information technology

face of the business processes that aim to establish enduring and mutually beneficial relationships with customers in order to drive customer retention, value, and profitability up'.

II- What is CRM?

In simple words, CRM is nothing but database marketing emphasizing the promotional aspects of marketing, linked to database efforts. Shani and Chalasani (1992), Bickert (1992) define CRM as the technological tool to build relationships with customers through a network of specific customers, with the objective of augmenting the marketing efforts of a firm for mutual benefit. Jackson (1985) however, applies the term to mean "Marketing oriented toward strong, lasting relationship with individual customers. Several authors have expressed similar views.

Berry (1995) and McKenna (1991) have a strategic role expected out of CRM, while they stress that CRM has a role in attracting new customers, it has a lot to do with developing closer relationships with these customers to turn them into loyal customers to the organization in long term. As such, Berry proposed that CRM might mean attracting, maintaining and enhancing customer relationships.

Dwyer (Dwyer et. al., 1987) have expected CRM to build a cooperative relationship with the marketing organization. Few others have focused on the select set of customers for an organization on the basis of their business volumes and criticality towards the marketing activity, with an emphasis on identifying and managing a relation with them for continued profitability of the organization.

While these and several similar other views are put forward, it remains to be seen as to which of these get established as the core functions of CRM. It would suffice here, if we set a fairly broad framework to study this area and explore the possibility of using this as a strategy and operational tool for organization. Therefore, we may define CRM as "a tool, process and strategy for a marketing organization which deals with the task of identifying, acquiring, nurturing and retaining customers for long term interactive and mutually beneficial association between customers and the marketing organization.)

As it is implied in the above definition, the purpose of CRM is to improve marketing productivity. Marketing productivity is achieved by increasing marketing efficiency and

by enhancing marketing effectiveness (Sheth and Sisodia, 1995). In CRM, marketing efficiency is achieved because cooperative and collaborative processes help in reducing transaction costs and overall development costs for the company. Two important processes of CRM include proactive customer business development and building partnering relationships with the most important customers. These lead to superior mutual value creation.

CRM emphasizes that customer retention affects the company's profitability because it is more efficient to maintain an existing customer relationship than create a new one. Also, customer Relationship Management (CRM) systems can help organizations manage customer interactions more effectively. To achieve the CRM objective, there is a series of aspects involved:

- The processes through which the customer relates with the organization, according to Thompson, are: marketing, sales, and service. In addition to these processes, and depending on the area of business, there are other processes which are directly affected and that must also be considered. The latter processes, however, are the most common and, generally, of broader scope.
- The human factor (people) with a key role within the CRM strategy, both on behalf of employees within the organization (who must be immersed in a cultural change) as of the customers.
- The technology is what facilitates implementing the CRM strategy; thus, it is necessary to know which of these technologies are and how they favor the CRM strategy.

III- CRM and SCM

The above definition of CRM captures the essence of present day management mantra, SCM too. It says, CRM is meant for a common cause of business and their customers, which is also the understanding that the concept SCM focuses on. In order to link the customer with the supplier, it networks the various players and using the tools for managing the information and products, it tries to achieve the goal of customer

satisfaction. As such, the concept of CRM is hand in glove with the dimentions that go well with SCM based management dimentions. CRM calls for capturing pertinent data about the prospective and current customers in respect of their buying pattern, shopping behaviour and usage habits of the products and services and to use the information to commence a two-way dialogue with them. That means, the essence of CRM is customer and continuity, and it goes well with the goals of Supply Chain Management.

2-3-4 The Value of Information sharing in Supply Chain

Supply Chain Management (SCM) is concerned with alignment of firms that bring products or services to the market (Lambert et. al., 1998), to improve the performance of the whole supply chain by considering their individual needs. One of the important issues of the coordination is to share product and production information among themselves (Helena et. al., 2010).

Information sharing at different levels of supply chain is considered to be basic ingredient to solve this issue. Lee and Whang (2000) therefore suggest that information sharing is a key enabler for supply chain management.

Information sharing strategy can be defined as that strategy adopted by the headquarters of an organization to integrate and coordinate the network (Barry and Venkatachalam, 2003). Several factors influence that strategy:

- product and competitive market;
- classification of the outsourced activity;
- global reach;
- efficiency and responsiveness;
- centralization or decentralization; and
- single and multiple sourcing

Many research works are devoted information sharing within the supply chain (Barrat, 2004). Lee and Whang (2000) describe information sharing as the enabler for tight coordination among trading partners. According to Stein and Sweat (1998), supply chain

partners who exchange information regularly are able to work as a single entity. Moreover, Tompkins and Ang (1999) consider the effective use of relevant and timely information by all functional elements within the supply chain as a key competitive and distinguishing factor. Kelle and Akbulut, (2005) have emphasized the importance of sharing supply chain information between supply chain partners in order to increase supply chain effectiveness and efficiency. McLaughlin et. al., (2003) demonstrate how one US manufacturing company shared information to improve its external downstream supply chain operations.

Lee and Whang (2000) describe information sharing as the enabler for tight coordination among trading partners. Sharing sales information has been viewed as a major strategy to counter the so-called "bullwhip effect" (Lee et. al., 1997). Cachon and Fisher (2000) studied the value of sharing data in a model with one supplier. Chen *et al.* (2000) quantified the bullwhip effect for a simple two-stage supply chain and demonstrated that centralizing demand information can significantly reduce the increase in variability. Raghunathan (2003) researched the value of demand information sharing between a single manufacturer and N retailers. Liu and Kumar (2003) found that some supply chain collaboration such as Third-Party Logistics (3PL), Vendor Managed Inventory (VMI), and Two-tier Collaborative Planning, Forecasting, and Replenishment (CPFR) rely more on inventory information than other information. Davis (2004) researched the influence of capacity, demand, cost, and retailer policy on the value of information sharing while sharing the retailer's inventory position and demand in a single supplier and a single retailer model. Several studies have emphasized the importance of sharing information between customers and suppliers in supply chains, especially point-of-sale (POS) and forecast data (Kelle and Akbulut, 2005; Christopher and Towill, 2000; Cachon and Fisher, 2000).

A supply chain is in the form of an extended enterprise, where firms collectively organize the supply, production, and distribution of products and services. Information sharing is a well-accepted technique for this purpose. Many research works are devoted to answering the question on 'what information to share'. Li et al. (2006) offer four types of data to be shared across SC, namely, order information which includes demand

information from the end customer to suppliers and the size and date of the order, inventory information includes on-hand inventory, backlogs, and work-in-process inventories with the level of inventory, unit cost, and policy used, and shipment. Lambert and Cooper (2000) identify SC issues that need to be managed, such as customer service management, order fulfillment, returns, etc. In addition, Lee and Whang (2000) describe certain types of information that are shared between partners. They specifically address inventory level, point of sale data, order status for tracking, sales forecasts, and production and delivery schedules. Walton and Marucheck (1997) consider five types of information in supply chain: forecasts, planned orders, planned production, capacity information, and inventory status. A more exhaustive listing of the types of information that organizations might share is provided by Froehle (1997). The paper contains a broad classification of shared information types into strategic, demand, technical, and performance information and lists many example of information of each type. Huang et al. (2003) provide classification of information in the supply chain. They classified information in the supply chain into six categories: product, process, planning, inventory, order, and resource. The classification of information is shown in Table 2.4.

Table: 2-4 Classification of production information model (PIM)

Classification of Production Information Model (PIM)	
CATEGORY	**PIM**
PRODUCT	Product structure
PROCESS	Material lead-time, Variance of lead-time, Order transfer lead-time, Process costs, Quality, Shipment, Set-up cost
PLANNING	Demand forecast, Order schedule, Forecasting model, Time fence
INVENTORY	Inventory level, Holding cost, Backlog cost, Service level
ORDER	Demand, Demand variance, Order batch size, Order due date, Demand correlation

RESOURCES	Capacity, Capacity variance, Supply

Source: Huang et al, 2003

Product information: This includes the characteristics of products manufactured and the production process. An example of product structure is a bill-of-materials (BOM), which may include cost data. However, product information is not an actively researched category in information sharing in a supply chain.

Process information: This includes the business processes in a supply chain that actually add value in fulfilling the customers' demand. General processes in a supply chain are ordering, production, and shipment. Process information may contain the mean and variance of the lead-time and set-up time, costs, policies, and the quality of the process. Tsung (2000) investigated sharing quality information of a supplier in a two echelon supply chain and concluded that real-time quality information sharing was most beneficial compared to no information sharing as well as one-way and two-way information sharing. Li et al. (2005) researched sharing the downstream customer's outbound shipment data, which represented "the amount of a product each stage immediately ships to its customer in response to a customer order after previous backorders are met." They found that sharing shipment data is beneficial when a supply chain has a relatively high service rate.

Planning information: This includes demand forecasts and order schedule. Finding effective technique of forecasting and sharing the data obtained is important. The order schedule denotes order quantity, which includes production order and purchase order, of in advanced time period. However, sharing planning information in a supply chain has not been studied much in the literature.

Resource information: This includes capability and capacity. Capability indicates the available number of products or processes that each member of a supply chain can sustain. Capacity indicates "the ability of satisfying future demand" (Huang et al., 2003). Within the information available in a supply chain, the most important information to be shared is demand and inventory information. By sharing either

demand information or inventory level, the whole chain can expect to reduce and find optimal amount of inventory that lead to reduction of total cost of the chain.

In summary, Information sharing among the members of the supply chain includes any type of data that could influence the actions and performance of other members of the supply chain. Ideally, such information should be accessible by the appropriate parties on a real-time, on-line basis without significant effort.

I- Benefits of Information Sharing

Engaging and exploiting the opportunities offered by IT is one of the hot topics for almost any modern organization. The importance of IT within a business environment increased significantly during recent years. Aviv (2001) examines the benefits of increased information sharing in the form of improved forecasting. Xu et al., (2001) concluded that collaboration and information sharing reduce inventory within the supply chain and improve efficiency in terms of resource utilization. Specifically, they find that sharing of the demand information is beneficial when the forecasting errors of the supplier are greater than those of the retailer before collaboration. Cachon and Fisher (2000) find that firms share information are able to gain competitive advantages by matching buyers with sellers before others can do it.

It can be claimed that many potential benefits can accrue from the proper share of information between business partners. These include but not limited to; improved customer service, increased sales, decreased administrative costs, decreased manufacturing costs, decreased inventory costs, improved data control, and reduced clerical errors that result in improved productivity, enhanced competitive advantage, reduced financial exposure, and better cash management.

II- Information Aspects; the quality and quantity

1- The Quality Aspect

Information sharing has two aspects: quality and quantity. Both aspects are important for the dimensions of SCM (Li et. al., 2006) and have been treated as independent constructs in the past SCM studies. For supply chain partners those depend on information, the information quality is one of the key determinants of the quality of their decisions and actions.

While information sharing is increasingly becoming a critical resource for an organization, the significance of its impact on SCM depends on what information is shared, when and how it is shared, and with whom. Literature is replete with example of the dysfunctional effects of inaccurate/delayed information, as information moves along the supply chain.

Information quality has been referred to constantly as information which must satisfy the needs of the user. There are two significant definitions of information quality. One is its inherent quality, and the other is its pragmatic quality. Inherent information quality is the correctness or accuracy of data. Pragmatic information quality is the value that accurate data has in supporting the work of the enterprise.

According to Strong et. al., (1997) quality information is the information that is fit for use by the supply chain partners. The quality or usefulness of data is dependent on the individual who is going to be using it. Good quality data would therefore meet the requirements of its intended use. The concept of quality is therefore relative, depending on the different perceptions and needs of the users of the data. There are various opinions of information usefulness and quality. Recently, Ballou et. al., (2004) suggest that information quality characteristics can be nebulous, with perfect information quality being difficult to achieve. The authors indicate that information quality tends to be shaped by the application environment in which users utilise that information – hence, user perceptions govern the quality attributes. Ballou et. al., (2004) identify information attributes such as accuracy, completeness, timelines and consistency as reflecting a

quality dimension that tends to be perceived as sufficient for user needs. Monczka, et. al., (1998) propose that information quality includes such aspects as the accuracy, timeliness, adequacy, and credibility of information exchanged. Information may have descriptive characteristics that relate, for example, to accuracy, completeness, relevancy and persistency – attributes that have information content dimension (O'Brien, 2001; Pipino et. al., 2002). Information may also be directly related to a time dimension (O'Brien, 2001; Cappiello et al., 2004) that includes descriptive characteristics such as timeliness, frequency and currency. Lee et al. (2002) grouped business information quality attributes into four categories – intrinsic, contextual, and representational and those that addressed accessibility. The authors suggested that information attributes that exhibit intrinsic quality are pure and inclusive of quality features, whilst contextual information attributes are those that are used within the user's sphere of application and add value because of timeliness, completeness, relevance and appropriateness attribute. The representational and accessibility dimensions reflect the importance of information systems per se in that they allow easy storage and retrieval of data – information quality values in these two dimensions encompass accessibility, interpretability, consistency and conciseness. Lee and Strong (2004) focussed on five types of information quality in an attempt to investigate relationships between knowledge and work performance. Information attributes that reflected quality in the view of these authors were accessibility, which directly reflected data availability; relevancy which is associated with how the information is applied to a specific task; a timeliness dimensions reflecting the creation date of the data; accuracy that Information quality attributes.

Helena Forslund (2007) in his "transition" study from the general studies towards Forecast Information Quality (FIQ) variables, defined and described FIQ with the four information quality variables: in time, accurate, convenient to access, and reliable. Forecast information being in time means that it is in the agreed time, when the information customer wants it. It is also concurrent to the situation, i.e. that the state of information used for decision making corresponds to the situation, so the data represented is not time-phased with regard to when it was registered and presented. Accuracy concerns the degree of obvious mistakes in the information. Forecast information coming from a customer might be impaired by obvious mistakes, which

must be corrected before being entered into the supplier's planning system. Convenient to access, deals with the ease of accessing the data without further processing. Processing could mean adapting an item code or entering it manually into the supplier's planning system. The fourth variable, reliability, refers to the probability that a forecast will remain unchanged. Unreliable information means uncertainty to the supplying company, which has to be absorbed by safety mechanisms.

2- The Benefits of Quality Information

Quality information within the context of a seamless supply chain structure is established as a key strategy for dampening demand amplification effects across value chains to help improve supply chain responsiveness. The commercial implications of this concept of quality information sharing implies a higher than normal because, the higher the quality information shared the greater achieving customer satisfaction. On other hand, poor information quality costs organizations a significant of operating revenue in process failure and "information scrap and rework" in direct costs with missed opportunity costs often greater. Indeed, a 5 percent reduction in supply chain costs can yield a 50 percent increase in profits (Taylor, 2003). Therefore, managing quality information is essential in sustaining competitiveness (Lee, 2000). Quality information sharing contributes positively to customer satisfaction (Spekman et al., 1998) and partnership quality (Lee, et al., 2002). Quality information sharing impacts the supply chain performance in terms of both total cost and service level (Zhao et al., 2002). According to Lin et al. (2002) the higher level of quality information sharing is associated with the lower total cost, the higher order fulfilment rate and the shorter order cycle time.

The rapid growth of distributed information systems has led to an exponential growth in corporate data collection and, consequently, a rapid deterioration in the quality of the information collected. This has resulted in:

- The capturing and use of poor or incorrect data increases operational costs.
- An inability to realise the value of the information collected

The consequences of distorted quality information effects are significant to the management of supply chains and have been identified as a significant barrier to efficiency and effectiveness of such chains. The presence of distorted quality information can drive excess inventory, capacity, and labour and therefore cost. It also has detrimental effects on customer service and responsiveness (Lee et al., 1997). As the objective of supply chain management is to synchronise supply with demand in order to drive down costs whilst increasing customer satisfaction (Christopher and Towill, 2001), the relative scale of distortion can act as a key indicator of the overall effectiveness of the supply chain.

This continuing trend means that businesses need to develop and implement information quality processes to ensure that the information they receive and store about their customers is not only accurate, reliable, complete and not duplicated, but that it can also be linked across different supply chain partners. This in turn ensures that the information stored in corporate databases can be successfully realised as a valuable and strategic business asset. Apart from reduced overall supply chain costs, the real benefits in implementing an information quality solution are derived from the improvement in business processes and the fostering of better customer relationships.

3- Information Quantity

Quantity aspect of information sharing refers to the extent to which critical and proprietary information is communicated to one's supply chain partner (Monczka et al., 1998). Seidmann & Sundararajan (1997) identify four level of information sharing based on the impact of shared information on each participating party. Higher levels of information sharing subsume lower levels. The first level of information sharing involves the sharing of only transactional data such as order and price. There are no joint decisions and each party acts independently to improve its own efficiency. The second level involves the sharing of some operational information such as inventory levels. An example of this level of information sharing is a Vendor Managed Inventory (VMI) system in which a supplier is responsible for buyer inventory management. The supplier

can gain benefits from better production schedules and lower inventory and the buyer benefits from better product availability hence increasing service level and lowering inventory costs. The next level is sharing strategic information. The shared information has minimal values to the party that owns information but can bring benefits when used by other party. Sharing point-of sales data is an example of this level of information sharing. By sharing actual sales data, the supplier can increase forecast accuracy and operational efficiency that can be valuable for both parties. The fourth level is sharing both strategic and competitive information. At this level, shared information has minimal value to the party who owns the information but can provide significant strategic and competitive benefits to the other party who receives the information.

III- Information Technology

A key goal of SCM is the integration of supply chain players' efforts, activities, capabilities and resources to create competitive advantages over the competitors. Although other characteristics and tools may be needed, the realization of this 'integration' is clearly enabled by information technology (Hill and Scudder, 2002; Kim and Narasimhan, 2002, Craighead and LaForge, 2003). Investment in IT for managing supply chains has been an effective way of obtaining competitive advantage (Kwan, 1999).

IT is used to transfer the information within the supply chain can be defined, which combines the definitions of Martin et al. (1999) and www.whatis.com:

> *Information technology is a term that encompasses all forms of technology utilized to create, capture, manipulate, communicate, exchange, present, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived).*

In other words, this definition of IT includes computer hardware, software, and communication systems, whereas some authors also include personnel and resources dedicated to supporting these capabilities (King et al., 1989; Stump and Sriram, 1997).

Another source defines IT as "encompasses the information that businesses creates, uses as well as a wide spectrum of increasingly convergent and linked technologies the process the information" Handfield & Nichols (1999).

There is a substantial amount of research conducted that addresses the role and impact of IT in managing supply chains. John McLaughlin et al., (2003) examines the role of IT in managing complex carrier service and rate structures, as well as outbound shipping scenarios for one of US manufacturing company implemented a transportation planning and optimization system to enhance their external downstream supply chain operations. The benefit derived from the study was an improvement in carrier and service mode selection. The project was able to determine benefits by comparing the most likely carriers to be chosen by the traffic coordinators for a group of loads with the optimizer's selection. Using the "rate shopping" function, the freight costs of each selection were recalculated manually and compared. Other area of study is the relation between IT adoption and organization performance (Andersen and Segars, 2001; Baker and Abrahams, 2001; Fisher, 2001; Da Silveira and Cagliano, 2006). The research continue to study different aspect of ICT: the use of EDI (Hill and Scudder, 2002), designing CPFR (Danese, 2007), the implementation/use of ERP (Wu and Wang, 2006), or the learning effects in on-line ordering (Kull et al., 2007).

Information technology is classified either internally oriented or outwardly directed (Stump and Sriram, 1997). Information systems that do not directly involve external organizations are called internal IT. Internal IT falls into the domains of office and factory automation systems that organize work more efficiently. The category of internal IT encompasses all information systems that are only used within the organizational boundaries. These systems can support the entire organization, or specific tasks or functions within the organization. Applications that are basically used inside the organization are office automation, transaction processing systems, enterprise resource

planning systems, data warehousing systems, groupware applications, intranets, and executive information systems. These are the information function, communication function, and decision support.

Ricky, et al (2004) show in their study the internal and shared IT and their benefits to an organization. They are summarized in the following tables 2-5 and 2-6 respectively.

Table: 2-5 Applications of internal IT and their benefits

Applications of internal IT and their benefits	
SYSTEMS APPLICATIONS	**BENEFITS**
Office automation	Reduction of processing time Improvement of quality Reduction of time-consuming routine work
Transaction processing	Reduction of overhead Faster response to customer demands
Enterprise resource planning	Force business process reengineering Reduction of cost Improvement of customer service
Data warehousing	Improved customer care Better planning of future developments
Groupware	Improved flow of information Reduction of redundant work Improvement of work-quality
Intranets	Provide additional organization-intern services Improved flow of information Better customer service
Executive information	Provide additional organization-intern services Improved flow of information Better customer service

Table 2-6 Applications of shared IT and their benefits

Applications of shared IT and their benefits	
SYSTEMS APPLICATIONS	**BENEFITS**
Inter organizational systems	Reduction of transaction costs Increased customer responsiveness Increase efficiency Differentiated products and services Increased bargaining power
Electronic data interchange	Reduction of costs for order processing Reduction of inventory and inventory costs Elimination of labor-intensive tasks Enhanced communication
Extranets	Strengthens closeness between participating organizations Reduction of operational costs Enhanced communication Reduction of cooperation costs

Source: Ricky, et al (2004)

Many information technologies assist with the integration and coordination, Inter-organizational systems, EDI and extranets are of the most popular shared IT tools.

EDI is the electronic transmission of information or documents such as invoices, bills of lading, or purchase orders between computer systems in different organizations based on a standard, structure, machine retrievable format. EDI can improve the buyer–supplier relationship through a more systematic and fluid interchange of information. EDI allows companies to exchange information electronically with little or no need for human intervention to transform or input data (A. Martínez and Sánchez, 2005).

Many studies have researched the effects of EDI on trading relations (Hill and Scudder, 2002; Nakayama, 2003); however, it is yet to be determined how EDI effects the SC

performance components (i.e. inventory levels, stock-outs, order cycles, fill rates). Firms view EDI as a tool for improving efficiencies, rather than as a tool for facilitating SC integration (Hill and Scudder, 2002). The supply chain can realize the difference between the effectiveness of an EDI-SC and a manual SC. More specifically, an electronic (EDI) SC is more effective than non-electronic (manual) SC. SCMS benefits may be classified as either more strategic- or operational-oriented. Other authors have made similar classifications (Dearing 1990, Subramani 2004).

There are additional categories used by software suppliers, many of which have coalesced with the rise of SCM. They include SCM itself (*Supply Chain* Management), *ERP* (Enterprise Resource Planning), CRM (Customer Relationship Management), PDM (Product Data Management), CRP (Capacity Requirements Planning), MES (Manufacturing Execution Systems), and APS (Advanced Planning & Scheduling).

Companies use these systems to manage control and automate complex information flows within or between firms (Kalakota,2000; Kalakota and Robinson, 2000), for key supply chain operations such as warehousing, transportation and back-office functions. The back office operations consist of the many transactions fundamental to the business. Examples are personnel records, booking sales, and ordering materials.

The sudden increase in electronic commerce and the Internet have resulted in new opportunities to improve the performance of the supply chain. The Internet can provide for the exchange of information crucial to efficient SCM, either in the form of Web pages accessible only to specific vendors or by means of an intranet enabled by the Internet. The Internet also has given rise to another feature of SCM in providing a venue for business-to-business product and services sales. Business-to-business e-commerce grew much more quickly than did the market for consumer goods (William M.2004). The Internet also has given rise to another feature of SCM in providing a venue for business-to-business product and services sales. Business-to-business e-commerce grew much more quickly than did the market for consumer goods. Armstrong and Hagel (1996) maintain there is beginning to be an evolution in supply chain towards online business communities. The Web enables all suppliers in a supply chain to identify and co-ordinate data transfers with each other. Research laboratories, pharmaceutical

distributors and end-users, for example, can all swap information on new product developments, specific diseases, and treatments within these settings.

2-3-5 Logistics Strategy

I- Introduction

The scope and influence of logistics has evolved in the late 1940s. In the 1950s, and 60s, military was the only organization which used logistics. It has been extended beyond the army, as it has been recognized as one of the important tools for developing competitiveness. Competitive advantage means the company has the ability to differentiate itself, in the customer's eyes, and also is operating at a lower cost and greater profit.

Logistics facilitates in getting products and services as and when they are needed and desired by the customer. It also helps in economic transactions, serving as a major enabler of growth of trade and commerce in an economy (Ismail et. al., 2010).

Logistics has come to be recognized as a distinct function with the rise of mass production systems. Production and distribution were earlier viewed as a sequential chain of extremely specialized activities (Emel et. al., 2011). The role of logistics is to ensure availability of all the required materials before every step in this chain. Obviously inventory of raw materials, semi-finished and finished goods is a must, across this chain to ensure its smooth functioning.

The concept of logistics has its base upon the systems approach. There is a single chain, with flow of materials starting from the supplier, to the plant and finally the end customer, and also these activities are done sequentially in order to achieve customer satisfaction at low cost.

With reference to an organization, an organization gets a concrete shape due to its structure. In the earlier times, the suppliers in distribution activities were spread across the entire structure, thus resulting in an overlapping of activities and finally in unaccountable authority and responsibility. In today's process driven organization,

where the focus has shifted from functions to process, logistics has become an essential part of the process.

Globalization of corporations and international orientations of management that sweeps national boundaries has introduced new challenges on the ability of organizations to deliver customer-adapted products all over the world quickly and on time. This has placed a number of demands on the logistics system and has become a rapidly developing area of investigation.

Logistics has evolved over the years to the points where logistical competency is frequently viewed as a strategic resource (Mantzer at al., 1989). It found a competitive edge in gaining and maintaining profitable customers which in turn result in increased market share and revenue. Most of the world class organizations emphasis logistics service as a competitive differentiator (Stern et al., 1993; Kwong et. al., 2011). These organizations focus on creating or adding value for the customer. As firms become more sophisticated and more adopted at leveraging logistical abilities, they move along the continuum from initial efforts targeted to customer service and on to re focusing toward achieving customer satisfaction and eventually, may shift to emphasizing customer success (Bowersox and closs, 1996).

II- Logistics Definition

Logistics has traditionally been defined as the process of planning, implementing, and controlling the efficient flow and storage of goods, services, and related information as they travel from point of origin to point of consumption (Council of Logistics Management, 1998). In this integrative approach, a cross-functional senior management group coordinates physical and informational resources to optimize efficiency and effectiveness. It manages both the purchasing (or inputs) side of the resource stream, and the distribution (or outputs) side of the stream as a single integrated flow. This flow typically encompasses customer service, physical distribution, materials management, information management, and their related, highly complex sub-processes: order processing and order tracking, production planning and supplier management,

purchasing, warehousing, transportation, and electronic supply-chain communications/payment systems.

Philip Kotler defines logistics as "planning, implementing, and controlling the physical flows of materials and finished goods from point of origin to point of use to meet the customer's need at a profit". Logistics is all pervasive.

III- Goal of logistics

Logistics have the following objectives:

- Reduction of inventory
- Economy of freight
- Reliability and consistency in delivery performance
- Minimum damage to products
- Quicker and faster response

IV- Logistics integration

The change in today's business environments encourage adoption of integrated logistics management and integrated information systems throughout the entire channel system (Kenderdine and Larson, 1998). Integrated logistics focuses on co - coordinating all logistics activities in a system that will simultaneously attempt to minimize total distribution cost and maintain desired customer service level (Gopal and Cypress, 1993). The results are increased efficiency and productivity (Larson, 2000). Benefits in the form of inventory reduction, shorter lead times, customer service enhancements, and improved forecasting and scheduling have been identified (Muller, 1990). Better supply chain performance (Gustin et al., 1994; Christopher, 1998; Ellram and Cooper, 1993; Christiansee and Kumar, 2000) and competitive advantage (Christopher, 1998) also have been highlighted as a results of proper logistics integration.

A key to logistics integration is the transparent flow of information from one end of the chain to the other. Supply chain partners are able to respond more rapidly to known demand with lesser inventory and hence lower cost by sharing information. A responsive supply chain is highly integrated. They integrate internally across functions and externally integrate with suppliers and downstream customers. A lot of companies are attempting to become more agile and responsive due to an encroached functional structure. They have a fragmented approach to the marketplace and thus manage functions rather than processes. It is also difficult for firms like these to reflect external integration when they lack internal integration. Companies that have got over this are now looking to design close linkages with their supply chain partners.

The following are the imperatives for successful integrated logistics:

- **New Culture**: Enabling employees to adapt to the new operating realities in cross-supply chain collaboration are a key component of integrated logistics. Core capability teams, which consist of professionals, must be focused on key integrated logistics activities, which synchronize activities across the entire supply chain. Senior executives entrusted with the task of integration and synchronization has to articulate the strategy for a new cross supply chain culture, which will be shared by all partners.

- **Agreements on cost-sharing and revenue-sharing**: Building a benefit structure balancing rewards with each partner's understanding of their contribution is important for maintaining close partnering relationships. A generally agreed upon framework for equitable revenue and cost sharing amongst all participants is necessary. Analyzing the supply chain economics examines the role and costs of each of the different participants of the supply chain. Detailed dimensions and performance metrics will help in understanding the participant's competitive advantage.

- **Establish Transparency**: Establishing of an integrated logistics system is challenged by participants' unwillingness to forgo any degree of control, which is a symptom of lack of trust. This lack of trust will hinder acceptance of integrated logistics while lack of standard communication and business processes will hinder implementation.

V- Need for Integration

A significant feature of a responsive organization is the priority the organization attaches for integration. Not only integration within the organization but also integration upstream with suppliers and downstream with distributors and customers is important. There is also a lot of emphasis on linking organizations through information. Information systems nowadays drive companies to reconsider their relationships with customers and suppliers. Process integration is achieved through logistics integration, which means both upstream and downstream integration. The objective in an extended enterprise is creation of an 'end-to-end' process so that innovative products are created and delivered at higher levels of quality and in lesser time frame to markets. This is achieved through the following means:

Rationalization of supply base: Companies try to rationalize their supply base by reducing the number of suppliers. In fact, companies are looking at these suppliers to provide systems rather than components. For example: the automotive sector is trying to integrate tier 1, tier 2 and tier 3 suppliers.

Centralized inventory: The extended enterprise not only includes upstream suppliers but also the downstream flow of finished products through dealer networks. Traditionally, when dealers did not have the product demanded by customers, they used to swap this with another dealer who had that product variety in stock. Today, enterprises have centralized inventory and also take responsibility for its management. The dealers have only demonstration models; they have on-line access of the enterprise supply system and can give the customer an immediate confirmation about the availability of the product of their choice and when it can be delivered. For those products not available from stock, dealers enter order directly into the production schedule and the product required is made to order.

Integrated Information Systems: The benefits of a fully transparent information system are being considered with the use of Electronic Data Interchange (EDI) together with the growing acceptance of 'just-in-time' philosophy. Suppliers can now manage the flow of materials into the plant on the basis of advance notification of a

company's production schedule. With integrated information systems, there are no manual orders, invoices or delivery notes. A single source of information provides the basis for a timely physical response, which automatically triggers payment to the supplier.

Supplier Development Programs: Supplier development has replaced the traditional purchasing function. A cross functional team of specialists work closely with suppliers and seek improvements in supplier processes as well as in the interfaces with the enterprise's processes.

Supplier involvement: Innovations in industries are supplier originated. By bringing suppliers closer to the process of new development, it has been found that innovation can be embodied in new products continually and simpler cost effective designs can be created.

Fig: 2-2 Logistics Integration (Source: Bowersox&Closs, 1996)

Logistics integration, Figure 2-2 can be described by two dimensions internal and external depending on the nexus of integrative activities. Stevens (1989) suggests that companies integrate internally first, and then, extend integration to other supply chain members. Internal integration consider the inter relationships and trade-off within the firm (Staude, 1987). In today's business complexity, integrated logistics generally is considered to have much boarder applicability. As La Londe and Power have noted, "Logistics executive of the future will require both horizontal (cross- functional) and Vertical (supply chain) information capability to effectively contribute to the competitiveness of the firm" (La Londe and Power, 1993). More detail discussion of the two types of logistics integration is given below.

1- Internal integration

Internal integration refers to the coordination, collaboration and integration of logistics across functional boundaries within a firm (Stock et al., 1998). Bowersox and Daugherty (1989) implicit in the recognition of the stages of integrated logistics is the notion that benefits, especially cost benefits, will be realized by companies that operate their logistics processes as an integrated system rather than by optimizing functional subsystems. Internal integration basically means making the internal operation smoother which is equivalent with decreasing the `internal transaction costs.

Such collaboration and coordination means that these functional areas must have formal teamwork and share ideas, information and other resources. Integration also means that there is a joint planning to anticipate and resolve operative problems, a joint establishment of objectives, a joint development of the understanding of responsibilities and a joint establishment of decisions about how to improve cost efficiencies.

The extent of internal integration would be reflected by the extent to which logistics activities interact with other functional areas, as well as the extent to which logistics is or is not a separate functional unit. For example, indications of higher levels of internal integration would include increased coordination of logistics activities with other departments in the firm, increased communication electronic and interpersonal between logistics and other departments, increased importance of logistics in the overall business strategy, and a blurring of the formal distinction between logistics and other areas of the firm (Mc-Ginnis and Kohn, 1990).

2- External integration

External integration is the second dimension of logistics integration in which the logistics activities across suppliers and customers are integrated (Stock et al., 1998). External integration is a relatively new concept and reflects a transformation of the manufacturing enterprise to encompass the entire supply chain, not an individual company. To compete effectively, supply chains must act as a cohesive entity, in effect changing from a collection of unrelated firms to a set of firms that form a productive enterprise. This form of manufacturing organization would necessarily require a greater

number of inter-firm operational interactions, as well as changes in the nature of these interactions.

External integration would be reflected by the extent to which the logistics activities of a firm are integrated with the logistics activities of its suppliers and customers. For example, many companies have created dedicated ''inter-firm'' logistics approaches, such as electronic data interchange, that link their manufacturing functions with particular suppliers of components.

Indications of higher levels of external integration would include:

1. Increased logistics-related communication both computer and interpersonal with suppliers and customers;
2. Greater coordination of the firm's logistics activities with those of its suppliers and customers; and
3. More blurred organizational distinctions between the logistics activities of the firm and those of its suppliers and customers.

VI- Supply Chain Management versus Logistics

Logistics management is that part of the Supply Chain Management processes that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.

These are the boundaries and relationships of Logistics Management adopted by the Council of Logistics Management: "Logistics Management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfillment, logistics network design, inventory management of third party logistics services providers. To varying degrees, the logistics function also includes sourcing and procurement, production planning and scheduling, packaging and assembly, and customer service. It is involved in all levels of planning and execution -- strategic, operational and tactical. Logistics Management is an integrating function, which coordinates and optimizes all logistics activities, as well as

integrates logistics activities with other functions including marketing, sales manufacturing, finance and information technology."

SCM encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies.

These are the boundaries and relationships of Supply Chain Management adopted by the Council of Logistics Management: "Supply Chain Management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing.

There are four different schools in defining the SCM:

1- Traditionalist

The traditionalist positions SCM within logistics, i.e. SCM is one small part of logistics. They have variously addressed the concept of supply chain management (SCM) as an extension of logistics, the same as logistics, or as an all-encompassing approach to business integration.

Stock & Lambert (2001) observed that the logistics community has tended to view SCM as ''logistics outside the firm''. This reduces SCM to a special type of logistics, external or inter-organizational logistics. Traditionalist practitioners may create new ''SCM analyst'' positions within the logistics group. SCM analysts would broaden the scope of logistics analysis, perhaps linking the logistics effort to other functions within the firm, as well as other firms in the supply chain.

2- Relabeling

The relabeling perspective simply renames logistics; what was logistics is now SCM. Leenders & Fearon (1997) describe ''logistics management, or supply chain management'' as an organizational strategy. Tan et al., (1998) discuss an evolution of logistics into ''integrated logistics'', which is now often called ''SCM''. Moreover, according to Jones & Riley (1985), SCM techniques ''deal with the planning and control of total materials flows from suppliers through end users''. This notion of SCM overlaps heavily with the Council of Logistics Management (CLM) definition of logistics. More recently, Simchi-Levi et al., (2003) confessed that they ''do not distinguish between logistics and supply chain management''. They also use supply chain and logistics network as synonymous terms. Relabeling narrows the scope of SCM, since SCM equals logistics.

Gammel et. al., (2001) reported results of a survey of supply chain managers. The survey included the following open-ended question: ''Please briefly describe what a supply chain manager does''. A large group of responses to this question reflected the relabeling perspective (supply chain manager as logistics manager).

3-Unionist

The logistics discipline is evolving with the SCM concept (Bechtel and Jayaram, 1997). The Council of Logistics Management (CLM) defines logistics as "that part of supply chain process that plan, implements, and controls the efficient and effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers' requirements" This requires coordination of activities both within and between companies in the supply chain.

Giunipero & Brand (1996) expressed similar view with the following statement: ''SCM is more than logistics''. According to Konezny & Beskow (1999), the components of SCM are: logistics (inventory, warehousing, packaging, distribution, transportation, customer service, purchasing, production planning and demand forecasting); strategic planning; information technology; marketing; and sales. Others develop SCM as an interdisciplinary concept drawing on fields such as marketing, economics, logistics and

organizational behavior (Hobbs, 1996). Moreover, New (1997) concluded that it is important to study social, political and ethical aspects of SCM. For some authors, the term ''SCM'' alone is not enough! For instance, Sandelands (1994) defines total SCM as ''gathering and exploiting quality information for all business areas, such as finance, marketing, and human resource planning''.

Stock & Lambert (2001) suggest ''SCM is the management of eight key business processes: (1) customer relationship management, (2) customer service management, (3) demand management, (4) order fulfillment, (5) manufacturing flow management, (6) procurement, (7) product development and commercialization, and (8) returns''. These processes subsume or include much of logistics, purchasing, marketing and operations management. According to Mentzer et al. (2001), ''all the traditional business functions should be included in the process of SCM''. In their model of SCM, these traditional business functions are marketing, sales, research and development, forecasting, production, purchasing, logistics, information systems, finance and customer service.

4- Inter-sectionist

Giunipero & Brand (1996) hinted at this idea with the following statement: ''SCM is not a subset of logistics but is a broad strategy which cuts across business processes both within the firm and through the channels''. The intersection concept suggests SCM is not the union of logistics, marketing, operations management, purchasing and other functional areas. Rather, it includes strategic, integrative elements from all of these disciplines. For instance, in the purchasing area, negotiating a long-term arrangement is a strategic element and transmitting a purchase order is tactical. The supply chain manager would be involved in the negotiations, but not the purchase order transmission. Similarly, in the logistics area, hiring a third-party logistics (3PL) provider is a strategic decision, while picking and packing in the warehouse are tactical. At the intersection, SCM co-ordinates cross functional efforts across multiple firms. SCM is strategic, not tactical.

In practice, inter-sectionist organizations may appoint a supply chain council, consisting of key executives across functions (e.g. logistics, marketing and purchasing) and

institutions (e.g. manufacturer, retailer and 3PL). The council would break down barriers to SCM and seek opportunities to apply SCM concepts to improve overall supply chain performance. A small, consultative SCM group, operating in a staff (rather than a line) capacity, would also be indicative of the inter-sectionist perspective. Logistics, marketing, operations and purchasing do not report to SCM. Rather, these departments draw on the SCM group for research, intelligence and consulting support. Despite a growing base of literature and experience, there appears to be no consensus on the relation between logistics and SCM.

2-3-6 Performance Measurement

> *When you can measure what you are speaking about, and express it in numbers, you know something about it ... [otherwise] your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in thought advanced to the stage of science. (Lord Kelvin, 1824-1907)*

1- Introduction

Performance measurement systems (PMS) have been an area for study and research for decades. Such research studies admit that performance measurement systems (PMS) allow an organization to align its business activities to its strategy, and to monitor performance toward strategic goals over time. It is for such reason; it can play a key role in supporting managerial growth in an organization either for small and medium enterprises (SMEs) or large enterprises (Garengo *et al.*, 2005; Chin et. al., 2010).

Performance measurement is an essential element of effective planning and control, as well as decision making. It can provide necessary feedback information to reveal progress, enhance motivation and communication, and diagnose problems (W.H. Ip et. al., 2011). According to Chan (2003), it reflects the need for improvement in areas with unsatisfactory performance. Thus efficiency and quality can be improved.

Neely (1994) defines performance measurement system as the set of metrics used to quantify both the efficiency and effectiveness of actions. The terms efficiency and

effectiveness are used precisely in this context. Effectiveness refers to the extent to which customer requirements are met, while efficiency is a measure of how economically the firm's resources are utilized when providing a given level of customer satisfaction. This is an important point as it identifies two fundamental dimensions of performance. In terms of effectiveness, achieving a higher level of product reliability might lead to greater customer satisfaction and in terms of efficiency, it reduces the cost incurred by the business through decreased field failure and warranty claims.

In SCM context, performance measurement can further facilitate inter-understanding and integration among the supply chain members. The measurement results reveal the effects of strategies and potential opportunities in SCM (Nudurupati, et. al., 2011) .

There are many publications that have addressed performance measurement in SCM. The literature on business performance measurement (BPM) emphasizes poor use of PMS in SMEs, but little research investigates the reasons for this. Some of the reasons mentioned in the literature include shortage of human and capital resources, lack of strategic planning, misconception of the benefits of performance measurement and an overly technical orientation (Barnes *et al.*, 1998). There are two main measures into the performance measurement field; the traditional performance measure and the non traditional performance measure (Operational performance measure). The researcher discusses the two types of performance measurements in more detail in the following sections.

I- Traditional Performance Measure

Traditionally, performance measures have been primarily based on management accounting systems. It focused on the financial indicators such as profit, return on sales, price variances, sales per employee, and return on investment. This approach received considerable criticism since the stress was only on the financial indicators. Critics argued that focusing on financial indicators only may lead to promoting short-term thinking (Hayes and Garvin, 1982; Kaplan, 1983). Johnson and Kaplan (1987) were among the first authors to criticize the traditional performance measurement cost

accounting-based approach, thus underscoring the need for integrated performance measurement approach. Carlos F. G. et. al (2006) states that the cost accounting approach focused on the minimization of variance rather than continuous improvement.

For the purpose of further understanding of these different financial performance indicators, a brief description is given.

1-Return on Investment

Profits/Investment (ROI) is probably the single most commonly used and studied measure of financial performance. Much of the popularity of ROI undoubtedly arises from its simplicity and ability to be generalized. ROI provides a performance measure that can be applied (at least conceptually) to virtually any business. The primary disadvantage of ROI concerns its sensitivity to accounting dimensions. In the process of simplifying the evaluation of an entire business operation down to profits/investment, many inexact accounting measurements are combined.

2-Market Share

Market share is often used as a key indicator of industry growth (David, 2001). It also used to describe the position and success of a firm in an industrial sector. Gale and Buzzell (1993) suggest that market share can be an important determinant of profitability in the medium to long term.

While the impact of market share is not always reflected in a firm's profitability or performance, many firms see it as an important organizational goal. The analysis shows that firms with increased market share are likely to have higher performance and in particular achieve enhanced financial performance, greater customer retention and customer satisfaction. This applies to all firm sizes. The implication is usually that the bigger the market share, the more successful the firm. This is not surprising, as firms with market leader status tend to derive profitability from their economies of scale capability as well as their established branding (Armstrong and Collopy, 1996).

3-Cash Flow

Many managers have replaced evaluation techniques based on profits (ROI) with techniques based on cash flows. The prevailing argument for this switch is that cash in hand, not accounting profits, is what can be spent or invested, and cash flow is therefore the more important financial measure to monitor. There are two primary categories of techniques based upon the analysis of cash flows:

1) Discounting projected cash flows, and

2) Balancing cash flows across a portfolio of diverse business units.

The literatures highlighted number of limitations with financial performance. These limitations could be classified into two categories: general limitations due to the overall characteristics and limitations specific to certain traditional performance measures such as productivity or cost. Both of these types of limitations make traditional performance measures less applicable in today's competitive market.

Alaa et. al.,(1996) discussed the main eight most commonly cited limitations; The most significant limitation of traditional performance measures is that they are based on traditional management accounting systems in which labor was the major cost driver that management accounting systems emphasized and other costs were de-emphasized by putting them together in one overhead category. However, today the average labor cost component rarely exceeds 12 per cent while overhead is usually 50-55 per cent of the manufacturing cost. Since in this case overhead is allocated based on the minor cost element of direct labor this allocation approach is not valid.

Lagging metrics The financial reports are generally compiled on a monthly basis. Therefore, they are lagging metrics that are the result of past decisions. As a result, it is considered too old to be useful for operational performance assessment.

Corporate strategy: Traditional performance measures do not incorporate strategy. Rather the objectives have been to minimize costs, increase labor efficiency and machine utilization.

Relevance to practice: Traditional performance measures try to quantify performance and other improvement efforts in financial terms. Yet, most improvements efforts are difficult to quantify in dollars (i.e. lead time reduction, adherence to delivery schedule, customer satisfaction and product quality). As a result, traditional performance measures are often ignored in dimention.

Inflexible: Traditional financial reports are inflexible in that they have a predetermined format which is used across all departments.

Expensive: The preparation of traditional financial reports requires an extensive amount of data which is usually expensive to obtain.

Continuous improvement: Fisher (1992) argues that setting standards for performance measures in general conflicts with continuous improvement. "If standards were not carefully set, they had the effect of setting norms rather than motivating improvement. Workers may hesitate to perform to their maximum if they realize that the standard for upcoming periods may be revised upward by current results."

Customer requirements and management techniques: Maskell (1998) argues that traditional performance measures are no longer useful, since, in order to meet customer requirements of higher-quality products, shorter lead time and lower cost management have given the shop floor operators more responsibility and authority in their work. Consequently, traditional financial reports used by middle managers do not reflect a more autonomous management approach.

II- Non - Traditional Financial" Performance Measures

Under the today influence of globalization and in spite of shortcoming of the financial performance measure which fails to clearly distinguish various levels such as strategic, tactical and operational especially in a supply chain. There is pressure to identify and report new, non-traditional, and "non-financial" measures of performance to get at newly recognized dimensions of enterprise value, success, and significance. These new demands emerge from a belief that social, environmental, ethical, and geopolitical factors materially impact the ability of a company or enterprise to perform favorably.

Kaplan and Norton, among others, argue that a firm needs a balanced set of measures covering the financial and non-financial dimensions of performance.

The use of non-financial metrics is crucial in measuring and fostering improvement of performance of supply chains. The main advantages of these non-financial measures include their flexibility and ability to take into consideration soft aspects linked to empowerment, trust and continuous improvement. It helps decision makers evaluate the success of the company's strategy and identify potential problems (Kaplan and Norton, 1996). Betchel and Jayaram (1997) claim that integrated measures, which are cross functional have to be used as they avoid optimization at one point in the chain without considering the potential consequences at other points on the chain. Remko (1998) argues that non-financial measures have to be developed as they supplement financial measures. They are very crucial and include a wide range of organizational and supply chain participants.

The characteristics of emerging performance measures have been discussed recently in the literature. The characteristics that have been mentioned include: measures related to manufacturing strategy; primarily non-financial measures (i.e. operational) so they can provide managers, supervisors, and operators with information required for daily decision making; simple measures so that shop floor operators can easily use and understand them; measures should foster improvement versus just monitor it; and measures should change as is required by a dynamic marketplace.

Alla *et al.* (1996) has outlined the major attributes of non-financial measures which is their greater emphasis on a holistic and strategic approach. They should therefore be:

- based on organization's strategy and needs;
- applicable to concepts such as JIT, TQM, SCM and other approaches used by the organizations;
- intended for all employees;
- lead to employee satisfaction;
- flexible; and
- Vary between locations of the organizations.

The differences between traditional and non-traditional performance measures are summarized in Table 2-7.

Table 2-7: Differences between Traditional and Non-Traditional Performance Measures

Differences between Traditional and Non-Traditional Performance Measures	
TRADITIONAL PERFORMANCE MEASURES	**NON-TRADITIONAL PERFORMANCE MEASURES**
Based on outdated traditional accounting system	Based on company strategy
Mainly financial measures	Mainly non-financial measures
Intended for middle and high managers	Intended for all employees
Lagging metrics (weekly or monthly)	On-time metrics(hourly ,or daily)
Difficult, confusing and misleading	Simple, accurate and easy to use
Lead to employee frustration	Lead to employee satisfaction
Neglected at the shop floor	Frequently used at the shop floor
Have a fixed format	Have no fixed format (depends on needs)
Do not vary between locations	Vary between locations
Do not change over time	Change over time as he need change
Intended mainly for monitoring performance	Intended to improve performance
Not applicable for JIT, TOM, CIM, FMS, RPR, OPT, etc.	Applicable
Hinders continuous improvement	Help in achieving continuous improvement

Source Alla *et al.* (1996)

2- Performance Measurement Models

Different supply chain performance measurement models have been developed in order to give an overall view of companies' performance and to guard against sub-optimization (Dong, 2011).These integrated systems are appropriate for a world-class manufacturing firm in many aspects. The following sections will discuss three such systems.

2-1 Supply Chain Operational Reference (SCOR) Model

The Supply Chain Council developed a straight forward framework for identifying, evaluating, defining and implementing performance measurement system. The model was created to respond to three primary practitioner needs:

1. Common definitions, processes and measurements.

2. A methodology linking business objectives, strategic and tactical with supply chain operations

3. A systematic approach for identifying, evaluating and monitoring supply chain improvement projects.

The starting point for the SCOR Model is a process description that is based on four basic management processes (Plan, Source, Make, Deliver), Figure 2-3. From these four processes a hierarchical model has been developed that can describe any supply chain by describing the elements and relationships within that chain. It is important to note that the process elements and descriptions associated with those elements are provided in standardized descriptions within the Model. The hierarchical model extends through three levels allowing the modeling organization to configure its modeling efforts to its unique supply chain and organizational elements.

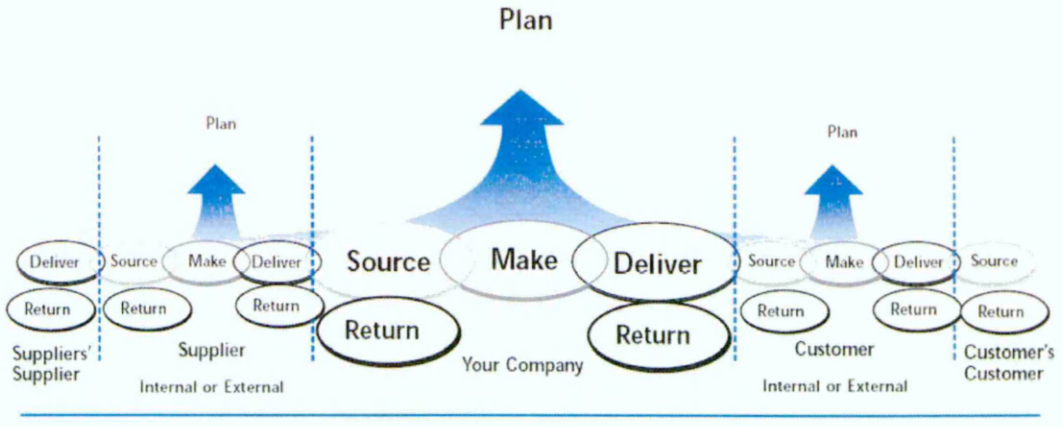

Fig: 2-3 Supply Chain Operational Reference (SCOR) Model (Source: http://www.scpiteam.com/S)

2-4 SCM and SMEs: What is the link?

The globalization has changed the business environment and behavior all over the globe. The globalization has led to an increasingly competitive marketplace. Organizations competing in an increasingly global market, independent of size or industrial sector, are reliant on SMEs to provide sub-contracting facilities. The Success in such business environment will indeed increasingly be based on quality, cost, delivery and service provided. Globally, increasing competition has caused the business to be improved.

On the other hand, consumer pressures for lower prices and higher quality of service are forcing the main supply chain players; suppliers, manufacturers and distributors to achieve greater business effectiveness and efficiency. Making supply chain efficiency is a key factor in gaining competitive advantage. As a result, both retailers and manufacturers are increasingly looking across the supply chain, beyond their traditional logistics boundaries, to form partnerships, with the aim of creating a seamless flow of goods and information from raw materials supplier to the end customer.

It is well recognized that adoption of supply chain management principle is one approach which has been demonstrated to provide success business competitiveness. It is making an increasing positive impact in world industry.

SMEs are not exempted from the pressure of globalization and market competition. Drihlon and Estime (1993) argue that improving competitiveness is now an imperative for small and large businesses alike regardless of their industry or location.

However, many SMEs firms have been strongly and positively impacted by the growing tendency of the larger pressure firms to outsource some of their activities. The role of the smaller firms as suppliers to the larger firms places a substantial burden on the small companies to become world class and embrace the principles of supply chain (Simons and Kerr, 1993). That means if an SME wants to be a key player and any supply chain process wants to prosper into the twenty-first century, they need to be aware of the importance of their competitive advantage and performance improvement (Forza and Filippini, 1998) and exert conscious and sustained effort to continuously improve all facets of their business operations in order to increase their competitiveness. Empirical evidence supports the argument that focusing on supply chain management not only can substantially improve its performance (Peters and Austin, 1985); but may well be the key to survival.

The role of supply chain is widely recognized as being a critical determinant in the success and survival of both manufacturing and service organizations in today's competitive environment, and thus, has focused attention on its effectiveness. In a number of organizations, cost-effective supply chain is a matter of survival. The globalization of some sources makes it essential that the professional practice is improved and regarded as a key element in the preparation of company or organization strategies (Quayle, 1998; Beamon, 1999).

Supply chain is also seen as a source of competitive advantage (Powel, 1995; Hackman and Wageman, 1995; Douglas and Judge, 2001), innovation (Singh and Smith, 2004), change and new organizational culture (Irani et al., 2004). Any decline in customer satisfaction due to poor service quality would be a serious cause of organizational failure.

Supply chain management (SCM) is a philosophy and presents a business system that companies should adopt to achieve organizational excellence. There is a perception that large organizations have traditionally led the way in the implementation of modern

management; the smaller ones always being followers and have lagged behind. Literatures survey showed that the majority of SMEs addressed supply chain issues partially and informally.

In more recent years the importance of supply chain management to the smaller firm has become a significantly recognized. They participate in value creating activities, especially for larger firms. They supply raw materials, produce products, and distribute finished goods to customers. Through their efforts, SMEs have significant impacts on supply chain processes (Huin et al., 2002). SMEs are often suppliers of goods and services to larger organizations. Increasingly, they have felt the impact of the quality programs imposed on them. The lack of product quality from SMEs adversely affects the competitive ability of the larger organizations. Because of this reason the larger companies have insisted that their small suppliers adopt TQM of their own (Barrier, 1992; Ghobadian and Gallear, 1996).

Many studies of supply chain management focus on the practices of large firms, while small firms are treated mostly from the viewpoint of larger firms (Chopra and Meindl, 2001; Kukalis, 1989; Lambert and Cooper, 2000).

Various suggestions have been made to help small to medium-sized enterprises (SMEs) implement SCM (Ghobadian and Gallear, 1996; Brown, 1993; Lee and Oakes, 1995; Husband and Mandal, 1999). Literatures suggest that smaller organizations with limited resources can equally apply the supply chain principles with measurable success, and without undue expense.

Many studies found that supply chain could be used by SMEs with considerable success. Studies by Spekman et al (1998) and Quayle (2003) found that the introduction of supply chain has helped in reducing costs without compromising on customer satisfaction levels. According to Alam, A. (1996), the perceived and realized benefits of SCM system consists of tangible and intangible benefits. The tangible benefits of SCM implementation include shortening the product development life cycle, increasing on-time order delivery, reducing production costs, improving quality, reducing inventory, and bettering inventory management. On the other hand, the intangible benefits include improving service quality, faster response to customer needs, sharing and exchanging

information, providing information accurately, timely, and consistently. Tan *et al.* (1998) sought a relationship between firms' SCM practice and their performance. They were able to show positive and significant correlation between certain SCM practices and performances of their respondent firms. Soonhong Min et al (2005) argued that, Supply chain improves Business chain collaboration. The expected outcomes of supply collaboration could be Supply chain capabilities that include better demand planning (McCarthy, T.M., Golicic, S.L. (2002), inventory visibility ((Sabath, R.E., Fontanella, J. (2002), and new knowledge and skills Verespej, M. (2005); Supply chain efficiency measured in reduced inventory and cost savings (Sabath, R.E., Fontanella, J. 2002), and Supply chain effectiveness including improvements in customer responsiveness (Sabath, R.E., Fontanella, J. 2002), and better access to target market segments McCarthy, T.M., Golicic, S.L. (2002).

2-5 Summary

In summary, this chapter reviewed the existing literature in the supply chain management field. It found that supply chain management evolved from different disciplines. The literature provided a historical evolution background for better understanding the subject. The literature provided different definitions and descriptions of supply chain management that developed over the time. The body of knowledge in this subject presented numbers of benefits that organization could gain for the effective adoption of proper dimensions.

Supply chain dimension is a key concept in the supply chain literature. The dimensions aimed at effectiveness the organizations through the appropriate selection and implementation.

Different supply chain dimensions were discussed and research survey questionnaires were developed by reviewing the existing literature. These survey questionnaires are now taken forwards in chapter four.

CHAPTER THREE

SAUDI ARABIA BACKGROUND AND MANUFACTURING SMEs SECTORS

This chapter gives a glance on Saudi Arabia profile. It reviews the geographical and economical position of the country. The chapter sheds light on the country's SMEs and the role of its manufacturing enterprises in the economy and the employment prospects. Furthermore, it discusses the support strategy of the country to its SMEs in order to contribute better o the country economy. In second section of this chapter, small and medium enterprises sector is discussed in more detail. Definition, characteristics, the importance and roles are the studied areas .The link between supply chain management and SMEs enterprises are discussed in the last part of this chapter. It attempts to show how SMEs benefit from adopting the supply chain management system.

3-1 Background /Geographical Factors

Saudi Arabia, formally known as the Kingdom of Saudi Arabia, is identified as the birthplace of Islam and the site of Islam's two holiest shrines in Mecca and Medina. The modern Saudi Arabia was founded on September 23, 1932, which is commemorated as its National Day. Saudi Arabia is the largest among the Arabian Peninsula countries. It is approximately 830,000 square miles (2 million square kilometers) in size. It is bounded on the north by Jordan, Iraq and Kuwait, the east by Qatar, and The United Arab Emirates, the west by the Red Sea, and the south by Oman and Yemen. Riyadh is the capital of Saudi Arabia. Saudi is comprised of 13 provinces and has five major geographical regions, namely:

- The great *Rub al Khali*: a sand desert taking up the entire south/southeast area.
- The *Nejd*: an enormous, infertile plateau situated in the center of Saudi and stretches out to the northeast.
- The *Hejaz* and *Asir*: mountainous areas that run parallel to the coastal plain along the Red Sea, and which gradually increase in elevation.
- The *Eastern Province*: the location of Saudi's rich oil reserves situated along the Persian Gulf.

Saudi Arabia has one of the highest population growth rates in the world, and increased from about three million in the 1950's to almost 28 million in 2010. Its growth rate is estimated as 1.848% in 2009 and is projected to continuously grow with almost same rate. The Figure below (Figure 3-1) shows ten years population growth change from the year 2000 to 2010.

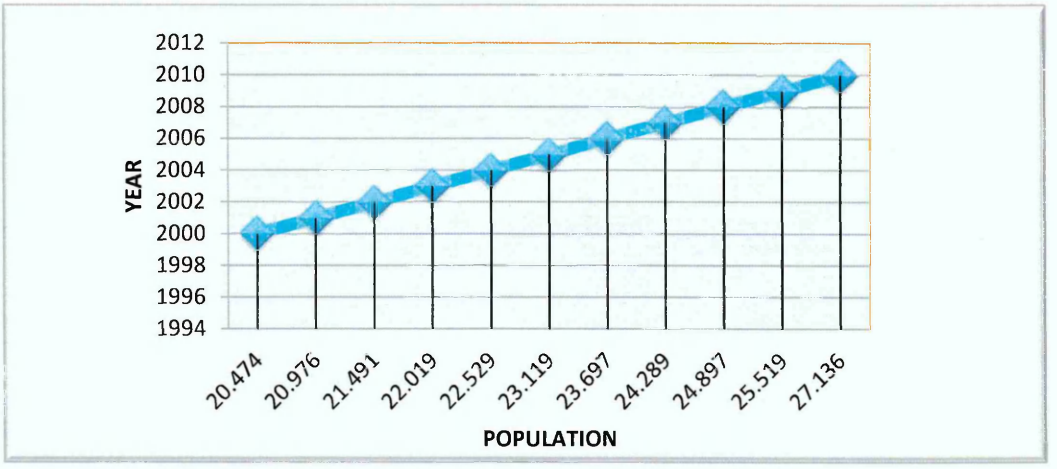

Fig: 3-1 Ten years population growth changes from the year 2000 to 2010.

Source: Ministry of Planning, 2009

An overwhelming majority of the Saudi population is young. According to the Saudi Ministry of Planning, 46 percent of the population was under 15years. Another 38 percent was under 40 years. Those over 40 years accounted for only 16 percent of the population.

Saudi Arabia needs to create a work force from among its own nationals which has the skills necessary to meet the requirements of the modern global economy. Labor force will grow from 3.1 million workers in 1999 to 4 million in 2020 an estimated growth rate of 89.2% in the coming 20 years.

Saudi Arabia is considering investing $400 billion in 2008-2013 to improve infrastructure and build new industries to accommodate the rising numbers of young adults entering the workforce.

Approximately 100,000 Saudis enter the job market every year and this number grows, particularly as more young generation take up their position in the labor force. The

government is encouraging private sector growth - especially in power generation, telecommunications, natural gas exploration, and petrochemicals - to lessen the Kingdom's dependence on oil exports and to increase employment opportunities for the swelling Saudi population. Private sector represented by SMEs is believed to be the destination to absorb the rising population growth.

3-2 Country Economy

Saudi Arabia's economy is oil-based with strong government controls over major economic activities. Saudi Arabia possesses 25% of the world's proven petroleum reserves, ranks as the largest exporter of petroleum, and plays a leading role in OPEC. The petroleum sector accounts for roughly 75% of budget revenues, 45% of GDP, and 90% of export earnings. About 40% of GDP comes from the private sector. Table 3-1 shows the general Saudi Arabia's economic index for the period of 2003-2011F. This index is extracted from different economic reports produced by the Saudi Arabia Monetary Authority (SAMA).

Table 3-1 Key Economic Data and Forecasts

	2010F	2011F
Nominal GDP ($ billions)	414.4	448.0
Total export revenues	221.8	231.9
Imports	88.2	97.0

GDP per capita ($)	15871	16675

Source: JADWA INVESTMENT, 2010

I- Saudi Arabia Export

Oil accounts for more than 90% of the country's exports and nearly 75% of government revenues. Non-oil exports increased to $16 billion in 2005 from $12.8 billion the previous year and went over $30 billion in 2008, making a growth of 10% over the previous year (export centre, 2010). The total export value for oil and non- oil products is shown in the Figure 3-2.

Fig: 3-2 The total export value for oil and non- oil products,
Source: Trading Economics, 2010

While petrochemical production from Jubail and Yanbu accounts for about two thirds of Saudi industrial non-crude oil exports, sectors such as metal products, electrical goods, machinery and industrial equipment, construction materials, wood products, textiles and garments as well as food and beverages are growing in importance.

II- Saudi Arabia Import

The Government of Saudi Arabia uses oil revenues to aid in building the country infrastructure and to increase the import of commodities and general goods. The government expenditure rose from 55% of GDP in 2003 to 60% in 2007. Saudi Arabia remains a key market for most countries in the world.

The Kingdom of Saudi Arabia imports different commodities and goods. The most significant imports in 1995 for example are capital goods with electrical and mechanical equipment providing 22% and transport equipment (cars and other transportation) 14% of total import values. Imports of foodstuffs stood at 16% of import values, with textiles and clothes at 8%. The structure of imports changes from year to year depending on the needs and varies from sector to sector.

Saudi Arabia's imports have strong correlation with the government expenditures (Figure 3-3). For example, the import values in 1983 represented almost 50% of the value of Gross National expenditure; by 1995 this proportion had fallen below 25%. Consequently, imports have become much less important to the Saudi economy resulting from the growing self-sufficiency-that is import substitution has taken place.

Fig: 3-3 Saudi Arabia Import, Source: Trade Economics, 2010

3-3 Saudi Arabia Support for SMEs

Saudi Arabia aims to ensure that future growth will continue to be sustainable, benefiting all citizens, maximizing its integration in the global economy. Therefore, the Government intends to reduce the dependence on the production and export of crude oil,

which is a delectable resource and is subject to fluctuations of the world markets, and diversify its economic base. Toward that end, the government became concerned about the key success factors needed to build a successful and sustainable economic strategy plan. These factors were highlighted in the Seventh Development Plan emphasized development of human resources, provision of work opportunities, and expansion of citizens' participation in ownership of productive assets, as well strengthening the role of the private sector. Privatization of some public services and facilities was started within the framework model of a comprehensive privatization strategy. The government Ninth Development Plan called for independent authority for small and medium enterprises (SMEs) in the light of their importance in economic development (www.zawya.com).

The government's interests shifted from controlling to a supporting strategy for SMEs. This support for the SMEs owed to its role in achieving strategic and economic goals of the country and their success was needed to sustain competitiveness, quality growth, and lasting prosperity. The government has adopted several measures and initiatives to support and develop the SMEs including the development of the required infrastructure, construction of Jubail and Yanbu industrial cities, and construction of industrial cities in various regions of the Kingdom. Also, founding the Saudi General Investment Authority (SAGIA), the Saudi Industrial Development Fund (SIDF) sponsors SMEs, and Saudi commercial banks provide loans to SME's implementation, and continued provision of other industrial support and incentives. The response and cooperation of the private sector with the governmental plans and efforts have an effective impact on actualization of the industrial development's achievements. The role of the government initiatives toward supporting the SMEs sector is described below.

I- The Saudi Industrial Development Fund (SIDF)

The Saudi Industrial Development Fund (SIDF) was established in 1973 with the specific objective of supporting the development of the private industrial sector. SIDF accomplishes this objective through provision of financial assistance in form of short-term loans to industrial investment along with technical, administrative, financial and

marketing advices to borrower enterprises. The specialized advice rendered positively contributes to improvement of projects' performance and assists them in overcoming the problems they encounter.

Among SIDF's prime objectives in the context of industrial development in the Kingdom are;

- The achievement of a good return on investment
- A suitable added value
- Replacement of imports by local products
- Promotion of non-oil industry related exports
- Realization of industrial integration
- Creation of employment opportunities for Saudi nationals
- Exploitation of the Kingdom's natural resources and raw materials
- The attraction of foreign capital as well as the transfer of technology
- Protection of the natural environment

SIDF's main achievements *(By the end of 2006)*

- US$ 15.5 billion total loan commitments.
- 1,999 Industrial projects.
- 558 Industrial Join-Venture projects.
- Foreign capital share in SIDF Financed Projects represents 32% of their capital.

II- The Saudi Arabian General Investment Authority (SAGIA)

The Saudi Arabian General Investment Authority (SAGIA) was created by the Saudi Government on April 10, 2000 as part of measures geared towards formalizing the process of economic liberalization. SAGIA is responsible for managing the investment environment in the Kingdom. Its objective is to achieve rapid and sustainable economic growth by creating a pro-business environment, providing comprehensive services to investors and fostering investment opportunities in key sectors of the economy, including energy, transportation, ICT and knowledge-based industries.

The institution is committed to supporting new and growing business in the country. Toward this commitment, SAGIA with other international institutions like Bahrain-based Islamic investment bank Venture Capital Bank, and international investment house Global Emerging Markets have signed a memorandum of understanding to establish an independent venture capital investment company.

The objective of the new company is to provide growth capital and late stage financing to venture capital opportunities and SMEs in Saudi Arabia.

Venture Capital Bank is the main promoter of the new company, whereby the Bank owns a significant stake in the new company and raises the rest of the capital from strategic Saudi investors, and high-net-worth individuals and corporate investors from other GCC countries.

Venture Capital Bank also serves as an advisor to the new company. It utilizes its strategic relationship with Global Emerging Markets to ensure that the new company follows international best practices, according to a statement.

III- Chamber of Commerce

The Small and Medium Enterprises Development Centre at Asharqia Chamber of commerce function as a strategic channel for the development of SMEs in the country. The Center was established as stated in its web site, with the objective of strengthening the spirit of initiatives between the people of the Province as well as supporting an active and important economic sector, the small and medium enterprises. The center aims to reach this objective by offering incentives and various programs, among them an award presented in the promising economic sectors in order to promote the society of initiators and business owners by working hand in hand to allow them to take more steps forward with greater success. The centre's mission is to provide high quality and valuable services to enhance the competitiveness of SMEs.

The Small and Medium Enterprises Development Centre at Asharqia Chamber established to help the SMEs with the following activities;

- ✓ To provide information to help startups and SMEs.
- ✓ To adopt innovative business ideas and give the opportunity for the implementation.
- ✓ To help launching new businesses through franchising.
- ✓ To provide free consulting and advisory services in fields such as: finance and marketing for start-up and existing SMEs.
- ✓ To hold lectures, seminars, and workshops that help increase the awareness about the important role of SMEs in the economy and interested issues.
- ✓ To provide investment opportunities and feasibility studies.
- ✓ To organize the chamber's entrepreneurship development programs to help potential entrepreneurs start their business in right way.
- ✓ To provide specific short-term training programs in selected topics to enhance the competitiveness of SMEs.
- ✓ To arrange the chamber's best performance SMEs award in selected sectors.
- ✓ To coordinate with the financial and supporting institutions to help start up entrepreneurs & SMEs.

IV- Small and Medium Enterprises Funding Guarantee Program

Inability to obtain appropriate funding comprises a major obstacle of development of the small and medium enterprises sector. Commercial banks are unwilling to provide the necessary funding for these enterprises. They believe that extending loans to such enterprises incorporates high credit risks stemming from the followings:

- ✓ Inability of small & medium enterprises to provide the required guarantees.
- ✓ Lack of credit history especially for start-up enterprises.
- ✓ Low or weak managerial skills & poor planning for sponsors of SMEs.

The program is established to close the gap and resolve the market shortage in the Kingdom and thus help small and medium enterprises get the appropriate funding through minimizing credit risk.

The program was established with a capital of SR 200 million. The Ministry of Finance contributed a hundred million; current ten local banks contributed the remaining amount. Hence, the program stands on three pillars:

- ✓ The government, represented by the Ministry of Finance and the Saudi Industrial Development Fund.
- ✓ The commercial banks and funding institutions.
- ✓ Small and medium enterprises (SMEs).

The program's primary function is to provide guarantees to financial institutions to minimize the risk inherited in lending to this sector. Therefore, the program will guarantee 75% of the loan amount in exchange for collaterals including mortgage on the fixed assets of the enterprise in favor of the lending institution. These collaterals are held in the position of the Fund until the loan is fully repaid after which they are released to the enterprise.

V- New Initiatives

The Kingdom's Ninth Development Plan is to be implemented from 2010 to 2019 by the Ministry of Economy and Planning. In the Ninth Plan, a major emphasis is being placed on balanced development of human, social, economic and environmental resources.

The development plan also focuses on improving the living standard of citizens, developing local human resources, ensuring an integrated development in all regions and creating competitiveness among manufacturers of national products.

3-4 The Current State of Industry in Saudi Arabia

Saudi Arabia has a robust economy that experienced rapid growth but remains largely dependent on the production and exportation of oil. However, since 1973, the Saudi Arabian economy has experienced a rapid shift from oil sector to non-oil sector activity (Al-Sahlawi, 1991; AlFarsy, 1991). The seventh plan (2000-2004) focuses more on economic diversification and a greater role of the private sector in the Saudi economy.

SMEs in Saudi Arabia are the main source of private sector investment. Their role in industrialization has been largely focused mainly to light and medium-sized manufacturing units operating in the service, trade, and manufacturing sectors. SMEs in Saudi Arabia represent almost 93 percent of total enterprises and employ over 80 percent of the work force. There are estimated 500,000 registered SMEs in the Kingdom, about a third of them are in Eastern Province. They are expected to contribute more than 50% of total industrial production. They are the only means by which the Saudi economy can diversify itself.

Saudi Arabia has played an instrumental role in developing the manufacturing sector of the country by directly investing in industrial plants in Jubail and Yanbu, mainly in the basic industrial sector, such as petrochemical, steel, and other large manufacturing enterprises.

In 1975 the Royal Commission for Al Jubail and Yanbu was developed. The commission was given authority to plan, construct, manage, and operate the infrastructure needed to support the basic industries the government intended to build and to satisfy the community needs of the work force employed in these industries. The commission was also to promote investment in secondary and supporting industries, to develop effective city government, and to train Saudis to take over as many jobs as possible.

The commission started by developing the basic industry under the name SABIC. SABIC was founded in 1976 as the fruit of an ambitious vision of the government of Saudi Arabia toward less dependence on the oil and gas industry. Natural gas, a previously useless by-product of oil extraction has historically been wasted through environmentally damaging flaring. The vision has been to transform it into valuable petrochemical products that could be supplied to the world. There are twenty one companies operating under SABIC umbrella which most of them use the wasted natural gas in their production.

In addition to the development of the basic industries in Jubail and Yanbu, the commission encourages the private sector to invest in support industries. As result of

this initiative, by 1999, it had more than 17 basic industrial plants, 13 secondary industrial plants and 110 supporting and light industries plants. Al Jubail benefited from the massive petrochemical projects of the Saudi Basic Industries Corporation (SABIC).

Yanbu is a major industrial site with a modern port from which products manufactured locally and in other areas of the Kingdom are exported. Yanbu had thirty six (36) secondary industrial plants and 108 supporting and light industrial plants by the end of 1999.

Stage one of the $5.9B development of Jubail Industrial City-2 will be completed by the end of 2023 for the all three stages.

The development is expected to generate foreign direct investment totaling $56B and provide employment for 55,000 people as well as another 330,000 indirect job opportunities.

The government's efforts to promote the industry in the country extended to the private sector.

Under the guidance of the government, the Saudi Industrial Property Authority "MODON" was established as the official authority to plan, construct, manage, and operate the infrastructure needed to support the basic industries the private sector intended to build and to satisfy the community needs of the work force employed in these industries.

Since its establishment in 1970, the Saudi Industrial Property Authority "MODON" has developed a huge industrial land through the kingdom. The following table (Table 3-2) shows the area of the industrial lands developed in the period between 1970 and 2010.

Table 3-2 the developed industrial lands in the Kingdom

the developed industrial lands in the Kingdom	
PERIOD	AREA OF DEVELOPED INDUSTRIAL LAND (SQUARE METERS)
1970-1975	1,440,000
1976-1990	32,475,500
1991-2000	6,966,244
2007-2001	1.600.000
2010-2008	**28.500.000**
TOTAL	71 million square meters

The Saudi Industrial Property Authority "MODON" successes in developing 18 industrial cities in different regions of Saudi Arabia;

1) Riyadh 1	2) Riyadh 2	3) Jeddah 1	4) Jeddah 2	5) Dammam 1
6) Dammam 2	7) Makkah,	8) Qassim	9) Ahsa,	10) Madinah,
11) Assir,	12) Al-Jouf,	13) Tabuk,	14) Hail,	15) Najran
16) Al-Kharj,	17) Jazan,	18) Ar'ar,	19) Sudair	

Saudi Arabia's industrial base has expanded enormously since the Kingdom's first oil boom in the 1970s with the number of operating factories increasing from less than 500 in 1975 to 4,600 by 2010. Capital invested in these similarly has risen from $2.6 billion

to $108 billion by 2010. There is a tangible economic benefit with exports of non- oil products amounting to $21B in 2006.

The average annual growth rate of the value added by manufacturing industries exceeded 8% during the past thirty years. Industry and manufacturing now provide employment for some 528,000 people by end of 2010.

The industrial sector has been developed since 1981. The development has covered different types of industries; metallurgical industry, chemical, plastic products, Chinese porcelain, building materials, textiles and garments, food and other activities.

Table 3-3 hereunder provides the detail of industrial development from 1981- 2006 along with different industrial sector.

Table 3-3 The development of operating factories between (1981-2006)

The development of operating factories between (1981-2006)						
INDUSTRIAL SECTOR	**1981**	**1985**	**1989**	**1994**	**2001**	**2006**
Manufacture of food and beverages	144	216	275	346	539	605
Textile, wearing apparel and leather industries	15	25	40	81	167	192
Manufacture of wood and wood products including furniture	27	46	70	100	174	191
Manufacture of paper products, printing and publishing	70	104	119	148	211	229
Manufacture of chemicals and petroleum, coal, rubber and plastic	116	200	273	399	693	895
Manufacturing of construction materials, chinaware and glass	225	309	359	439	570	618
Basic metal industries	4	6	8	10	12	618
Manufacture of fabricated metal products, machinery and equipment	226	361	484	633	948	463
Other manufacturing industries	10	25	45	57	83	79
Transport and storage	13	21	21	21		16

					21	
TOTAL	850	1,313	1,694	2,234	3,418	3,906

Source: Ministry of Trade and Industry, 2010

In the respect of investment, the refinery industries come in the top of the list with 75 factories at rate of 40.4% of the total investment, followed by non- metal industries by 679 factories at rate of 13.4%, chemical industries 422 factories at rate of 10.5%, of the total funding for existing plants in Saudi Arabia. The numbers of plants for metal basic industries are 296 factories received 13.8 % of the funding.

The country's strategy aims at developing the productive non-oil sectors at an average annual rate of 7.1 percent during the next two decades, as their share in the GDP will increase from 24.9 percent in 2004 to 27.4 in 2024.

The Private sector's contribution to total GDP is increasing from 51.2% in 1999 to 69.2% in 2020 and the value added of private sector is anticipated to grow by 5.73 annually.

Saudi Arabia has generated about 60% GDP from industrial sector as of 2010 and 36% of service industry.

Industry and Manufacturing in 2004 contributed 8.8 percent of gross domestic product (GDP) and in 2002 provided employment to 8.1 percent of the Saudi workforce. Experts projected a manufacturing production growth rate of 7.1 percent for 2005. Most manufacturing jobs are tied in some manner to the minerals sector.

As a result of the country's strategy toward economic development, the government maintaining high levels of development and efficiency in the private sector through:

- transferring investment from low-productive sectors to sectors with high productivity
- adoption of managerial and production techniques used in developed countries
- encouraging R&D
- Diversifying government revenues

3-5 E Eastern Province Industry

Eastern Province is a home land for the first and second industrial cities in Saudi Arabia. The estimated number of productive factories in the area is 880 factories till 2006 which representing 22.5% of the total of productive factories in Saudi Arabia for the same period, with invested capital reached more than SR140 billion Saudi Riyals. Table 3-5 shows the comparative industrial development for the last ten years.

Table 3-4 The comparative industrial development for the last ten years

the comparative industrial development for the last ten years		
YEAR	TOTAL NO. OF FACTORIES IN SA	TOTAL NO. OF FACTORIES IN EP
1996	2598	632
1997	2688	651
1998	3163	745
1999	3300	761
2000	3418	790
2001	3521	806
2002	3601	829
2003	3652	848
2004	3723	858
2005	3877	876
2006	3906	880

Source: Ministry of Trade and Industry, 1999

As such the Eastern Province is considered the third city after Riyadh and Mecca in number of factories and ranks the first in the total invested capital.

In summary, the small and medium enterprises (SMEs) sector has tremendous resources, which qualifies it to play a major role in the economic development of our nation. The experiences of many nations, developed, developing or underdeveloped alike, proved

the effectiveness of this sector in lifting up their economies. In Saudi Arabia, this sector, if handled correctly, plays important economic roles, particularly in manpower employment, in increasing and diversifying the gross national product, in minimizing adverse effects of cyclic economic fluctuations and in vitalizing & energizing the market and the business community as a whole. Further benefit is the contribution towards improvement of the economic and social development of the remote regions of the Kingdom.

3-6 Small-Medium-sized Enterprise (SMEs)

The Small-Medium-sized Enterprise (SMEs) sector is an important part of any national economy (Storey, 1994). It contributes to economic growth, both regional and national. In Europe, while industrial giants continue to slash jobs, high-growth SMEs are creating thousands of new jobs in manufacturing and services (Flynn, 1998). They constitute a large part of the economy in most countries, dominate the industrial and commercial infrastructure and have significant roles in economic growth (OECD, 1996; Tetteh and Burn, 1999; Curran and Blackburn, 2001). In developing countries, SMEs continue to play a critical role in their country's industrialization program through the strengthening of both forward and backward industrial linkages.

They are not only providing job opportunities, but also, acting as suppliers of goods and services to large organizations, and any lack of their product quality could adversely affect the competitive ability of the larger organizations (Rose, 2000; Greenan et al., 1997; Ghobadian and Gallear, 1996; Parkin and Parkin, 1996; Storey, 1994). In manufacturing sector, SMEs act as specialist suppliers of components, parts, and sub-assemblies to larger companies because the items can be produced at a cheaper cost than the large companies could achieve in-house.

With dramatic change towards global market orientation and trade liberalization, most of the business people realize the vital role of SMEs. The SMEs assume these roles by complementing the activities of the large-scale industries through integration into the mainstream industrial development.

Larger organizations are reliant on SMEs, as they represent an essential element of their supply chain. They provide sub-contracting facilities, provide essential inputs and components that will form the critical linkage between industries, and have a vital role in operating these supply chains effectively, as satisfying the demands of any market rarely depend upon a single organization. Usually it depends on a network of suppliers, most of which will be SMEs, each carrying out its own role effectively as part of a larger, overall supply chain. At each stage in the supply chain, the integration between each organization is a key method of improving the performance of the whole system. Each 'link' in the chain presents opportunities to both, satisfy or to disappoint the customer. Thus, SMEs can favorably influence the competitiveness of large organizations.

It is envisaged that with the growth of SMEs, industrial base will be strengthened further leading to enhance the nation's economy. It is, therefore, imperative for SMEs to meet quality standards, as large organizations need assurance of high quality goods and services from SMEs. The importance of the small and medium industries will become more significant as the developing and underdeveloped countries expand their industrial base in meeting the challenges of the new market trend.

3-6.1 Small and Medium Enterprises Definition

At present, there seems to be no consensus on the definition for SMEs. Variations exist among countries and industries. Storey (1994) argued that there is no single, distinct and uniformly acceptable definition of a small firm. When reviewing the literatures one comes across an array of definitions like:

1- Bolton Committee's definition (1971) which is the most acceptable definition within the academic context. In this report, business sector is the determinate criteria of the definition.

2- European Commission definition for SME has to satisfy the criteria for the number of employees and one of the two financial criteria, i.e. either the turnover total or the balance sheet total. In addition, it must be independent,

which means less than 25% owned by one enterprise (or jointly by several enterprises).

3- The Department of Trade and Industry (DTI). It used the number of employees of an organization to distinguish different business sectors.

This difference in the definition is because employment, turnover and capitalization vary among different industries. Additionally, any size definition that relates standard measures of size at a particular activity level may be relatively small or large in comparison to other industries. According to early critical contributions, SMEs must satisfy criteria related to *markets, ownership* and *control.* Another perspective on defining SMEs attempts to identify those characteristics, other than size, which distinguish a small enterprise from a larger one, which are: *uncertainty, innovation* and *evolution* Wynarczyk et. al., (1993).

3-6.2 SMEs Characteristics

Welsh and White (1981) suggested that "a small company is not a little large business", because small firms have different characteristics over their large-scale counterparts. The characteristics of SMEs tend to influence their strategic capabilities and competitiveness.

Storey (1994) stated that there are three key distinguishing features between large and small firms. Firstly, the greater external uncertainty of the environment in which the small firm operates and the greater internal consistency of its motivations and actions. Secondly, they have a different role in innovation; small firms are able to produce something marginally different, in terms of product or service; this differs from the standardized product or service provided by large firms. A third area of distinction between small and large firms is the greater likelihood of evolution and change in the smaller firm; small firms which become large undergo a number of stage changes. The following section discusses the definition of SMEs of different institutions.

In comparing the characteristics of SMEs and large organizations, they could be classified as strengths and weaknesses versus large organizations.

SMEs are in a more advantageous position in terms of structure because it facilitates faster communication line, quick decision-making process, faster implementation, short decision-making chain, and higher contribution as a source of ideas in their operations and innovation, unified culture and very few interest groups (Kraipornsak, 2002). A majority of SMEs have simple systems and procedures, which allow flexibility, immediate feedback, better understanding and quicker response to customer needs than larger organizations (Kraipornsak, 2002). This is further enhanced by the SMEs corporate mind-set, which is conducive for new change initiatives, provided that the owner/management has the commitment to, and leadership of the change process, together with a sound knowledge of it. In addition, SMEs employees are given the authority and responsibility in their own work areas that can create cohesion and enhance common purposes amongst the workforce to ensure that a job is well done.

A distinguishing feature of SMEs from larger firms is that Small and Medium Enterprises (SMEs) have limited financial resources and lack of access to commercial lending (i.e. difficult to obtain loans) (Hashim and Wafa, 2002) for investing in technology, infrastructure and training and limited resources in the form of time and personnel.

In terms of human resources, SMEs are always faced with the shortage of skilled labor and they have to compete with large companies for skilled workers (i.e. large companies able to offer skilled workers better wages and working conditions) (Reed et al., 2001; Chee, 1987). They have low level of formal education and limited training in new management principles and practices. As a result, SMEs do not have adequate budget for staff training which lead to lack of managerial and technical expertise (Hashim and Wafa, 2002; Chee, 1987).

Very often SMEs rely on one-person management, thus insufficient time and attention is given to the various managerial functions (Hashim and Wafa, 2002). In SMEs, the owner controls everything; poor management is attributed to the owner's lack of business experience, lack of management experience or know-how (Pickle and Abrahamson, 1990; Baumack, 1988).

A majority of SMEs rely on outdated technology, labor intensive and traditional management practices. Some do not trust new technology, while others are unable to afford it, which in many cases leads to inefficient, lack of information and inadequate in-house expertise (Hashim and Wafa, 2002).

In addition, SMEs are also faced with frequent raw material shortages and have to pay more, fluctuation in raw material price, inability to obtain credit terms, inadequate inventory management and control of stock in raw materials and less bargaining power compared to large companies (Kraipornsak, 2002; Chee, 1987). Furthermore, they may encounter more barriers due to increased competition at national and international levels, particularly if they do not have the capacity or resources to meet the demands of their trading partners in the supply chain (Lummus and Vokurka, 1999). It is apparent that most SMEs may find themselves disadvantaged due to the lack of extensive resources required for efficient supply chain management.

Thus, it is important to appreciate the differences that exist between SMEs and large business organizations. In other words, it is crucial to try and understand SMEs issues and characteristics before making any attempt to help them in implementing SCM philosophy.

3-6.3 The contribution of SMEs Towards Economic Performance

Small and medium enterprises (SMEs) constitute a large part of the economy in most countries and their contribution towards economic performance is now universally accepted as significant (Beaver, 2002).

In the European Union (EU), SMEs account for 99 per cent of activity according to the "European competitiveness report" (Commission of the European Communities, 2003). Of these, 93.3 percent were micro firms, 6.2 percent were small, and 0.5 percent was medium size. Only 0.1 percent of the 17 million was defined as large firms (ENSI 1994).

Flynn, (1998) argued that, in the European Union (EU), high-growth SMEs are creating thousands of new jobs in manufacturing and services. The study by Storey (1994)

reported that the panorama of EU Industry concluded that small firms in both the USA and the UK created jobs faster than large firms in the 1980s and, furthermore, small firms are more consistent job creators than large firms because they are less affected by macro-economic factors.

SMEs in the EU constitute 66 percent of the sales of the non-primary sector. However, if we exclude the large economies of Germany, France, and Great Britain, the figure is around 75 percent for most countries. SMEs control 50 percent of manufacturing sales, 67 percent of services, and 90 percent of the construction and trade sectors. Micro firms sell mostly to final customers and operate in more segmented product markets. It is the larger firms that are more likely to export. The smaller firms depend more on their local economies than do large firms. They would therefore have greater multiplier impacts.

In the United States, while the employment share of large companies dropped from 20 per cent in 1970 to 8.5 per cent in 1996 (Carlsson, 1992, 1999), ninety percent of new jobs in the United States are generated through small- and medium-sized enterprises (SMEs).

Small businesses make up a major portion of businesses in developing countries It is estimated that SMEs employ 22% of the adult population in these countries (Daniels, 1994; Daniels &Ngwira, 1992; Daniels &Fisseha, 1992; Fisseha, 1992; Fisseha& McPherson, 1991; Gallagher & Robson, 1995).

In India for example, SMEs occupy a prominent position in planned development of Indian economy. The SME sector accounts for 40 percent of the industrial production, 35 percent of the total export and provide about 80 percent of employment in the industrial sector in the country. Over the years, SMEs have shown a consistent growth rate (Ghose, 2001).

The growing significance of SMEs in China's economy is hard to ignore. Chinese and foreign experts estimate that SMEs are now responsible for about 60% of China's industrial output and employ about 75% of the workforce in China's cities and towns. SMEs are responsible for creating most new urban jobs, and they are the main destination for workers laid-off from state-owned enterprises (SOEs) that re-enter the workforce.

3-7 Why study on SMEs?

SMEs constitute a large part of business array in most countries and they have significant roles in economic growth (Curran and Blackburn, 2001). Small firms make up the vast majority of businesses in Europe and the UK. In 1996, around 90% of European businesses were classified as SMEs (CCEM 1997) and in 1998 there were 3.7 million businesses in the UK, of which 99% were small businesses employing less than 50 people and only 25 thousand were medium sized employing between 50 to 249 people (DTI 1999). According to the SBA Office of Advocacy (2003), 99.7 percent of US businesses are SMEs. Thus, an increased importance has been given SMEs.

SMEs do not only contribute to the country's economic growth, but also create thousands of new jobs in manufacturing and services industry (Flynn, 1998) while large scale organizations continue to slash jobs, provide critical parts and components to the large scale organizations and influence the competitiveness of large organizations by providing high-quality inputs. Thus, both linkages of a supply chain; the forward and backward could be strengthening. Therefore, the study of small and medium scale enterprises is based on the following propositions:

- SMEs represent more than 90% of overall business enterprises in most of the countries.
- They are a vital engine of nation's economic prosperity;
- A good provider of employment;
- Have been recognized as a seed-bed for indigenous entrepreneurship;
- Adapt easily to customer requirements (flexible specialization).
- Promote indigenous technological know-how;
- They have been recognized as a seed bed for innovative product;
- Many large businesses grow from the acquisition of smaller firms.
- They represent main entity in supply chain linkages;
- SMEs are often suppliers of goods and services to large companies.
- Many studies of supply chain management focus on the practices of large firms, while small firms are treated mostly from the viewpoint of larger firms (Chopra and Meindl, 2001; Kukalis, 1989; Lambert and Cooper,

2000). Therefore, more research effort is needed to study the impacts of SMEs in the context of supply chain management. Since the long-term sustainability of SMEs depends on "where they compete" and "how they compete".

The research reported here, therefore, seeks to add to the body of knowledge by providing evidence of the importance of SMEs to the industry and to a country's economy in all.

3-8 Saudi Arabia Corporative Culture

Supply chain management continues to be the choice of world class corporative as their medium for creating and sustaining a competitive advantage (Ireland and Webb, 2007). Such a displacement is understandable in considering the potential benefits of successful SCM. These benefits include maintaining the market share, operation efficiency and customer satisfaction. The ultimate goal of this is a "Win- Win solution" with all business partners.

Despite these enticing benefits, organizations who partner in strategic supply chains continue to encounter barriers (Hendricks and Singhal, 2003). Existence of these barriers could hinder the promising competitive advantages of SCM. Some of these barriers come as a result of corporative culture. Corporative culture consists of beliefs, values, norms, customs and practices of the corporative (Ott, 1989).

The importance of organizational culture is well documented to the success of a corporative. It is increasingly evident that top management must have an explicit focus on the development and maintenance of their organization's culture.

The improvement success is more likely where the cultural elements of a leadership, supplier relationship, customer focus, continuous improvement, and teamwork and employee involvement are stronger. Those elements are likely to be stronger where SCM is implemented.

Schein (1992) defined the corporative culture concept as a system of norms, shared values, concerns, and common beliefs that are understood and accepted by the members of the organization. The members of the corporative accepts these as valid, follow and teach them to the incoming members as a pattern to be followed for problem solving and required thinking style and behavior.

Most if not all of change initiatives like SCM adoption failures – and failures of other such initiative– are not only the failure of the management. Rather, they may be attributed to deeper, more critical sources: the fundamental, pervasive culture of the corporative and the operating climate that culture instills in its employees. Often, managers are victims of that culture, just as change itself is a victim of the implementation process. In order to improve the odds of success when attempting to introduce any change in the corporative– especially SCM– managers should first comprehensively examine their organization's underlying culture and the operating climate created and constantly influenced by that culture. These two characteristics determine the readiness required for acceptance of the SCM philosophy within a corporative (McNabb and Sepic, 1995).

SCM can have a dramatic impact on the culture of a corporative (Lawler *et al.*, 1998). SC is a management approach in which the application of practices such as teamwork, internal customer relationship, and supplier partnership are tools for cultural transformation, and involves a major cultural change in the corporative (Entrekin and Pearson, 1995). SCM is a complete change in an organization's culture and the way people behave at work. On the other hand, organizational culture appears to be a crucial factor in understanding the ability of any corporative to perform and compete (Cicmil and Kekäle, 1997). This is especially an issue of Saudi Arabia corporative where services are provided by multinational group of people with different cultural values.

In the following section, the author will shed light on some important elements to the success of SC implementation that is related to Saudi Arabia SMEs. These elements are but not limited to, senior management leadership, customer relationship, and teamwork.

The importance of soft issues in the implementation of SC is well documented and recognized in the literatures. Among these soft issues is leadership. According to some management and quality initiatives such as Baldrige Award, EFMQ, TQM and SC the assessment category of leadership examines senior executives' personal leadership and involvement in creating new corporative structure.
Leader is regarded as a driver in such initiatives. An inadequacy of leadership may impede continuous improvement to strive for outstanding performance. It is thus important for a senior executive to learn continuously about real essences of SCM and the way to implement leadership in the pursuit of SCM.

Management leadership is more associated with providing vision, direction and particularly with the ability of sharing, generating commitment, involving others and creating levels of synergy, consensus, congruence and enlightenment. It is about reacting to adverse situations with wisdom, courage and object but also is about risk taking and seeking success and advancement.

The role of leaders can be extended including the identification of priorities and agendas of the corporative and assigning these priorities for each actor, and have to bring the various people together so that the act is complete.

Saudi Arabian SMEs are mixed of local and multinational companies. The multinational companies are either fully foreign ownership or joint venture ownership. Accordingly, the management schools are varies among local firms in Saudi Arabia and other multinational companies.

The management style of Saudi managers is influenced by different variables like gender, level of education, and the organizational position of subject managers.

In many SMEs, the vision, mission and strategic plan are not clear. The primary focus of these companies is on short-term strategic goals which tend to be financial in nature.

A number of management initiatives ends with failure within the context of SMEs. The failure could be attributed to the following:

a. Limited understanding of the certain initiative (SC) and its potential.

b. Lack of consistent commitment and support, leadership style of managers – too top or too laissez faire, superficial knowledge of the implementers.

c. Vague improvement goals, unclear strategies and conflicting priorities.

d. Lack of developing and sustaining oriented culture.

e. Lack of employees' motivation, participation and team working, employee apathy and resistance to change.

f. Lack of linkages between remuneration and firm's performance.

g. Lack of recognition for success.

h. Lack of training, education and technical knowledge and experience, poor coordination, close vertical communication (from top to the bottom)

i. Lack of work discipline.

The organization chart, in many of these SMEs, is not well established. Accordingly, the authority, the communication channel and the job description are poorly defined. As in many SMEs, minimal support in financial allocation hinders the corporative growth. Senior managers of Saudi SMEs do not invest in promoting awareness of SC through training, seminars and open sharing. These observations indicate that there is still a room for leadership improvement in Saudi Arabia.

To achieve successful implementation of SC within Saudi Arabia SMEs, leaders of these organizations need to ensure that all facets of the organization, the organizational structure, management style, training, communications, compensation and promotion systems, and systems, procedures, and processes would reflect SC principles.

To look at the entirety of the organization's culture, we need to identify the performance on customer relation. Every company has its own strategy to build long term customers'

reputation. This initiative gives a challenge to apply it in responding this crucial demand but the result will give good benefits to the interest of the organization.

Customers and buyers are always part of the cycle in the system. They are the heart of the business to keep the company alive and successful even high pressure is at stake in nurturing good relationship. It is essential to build a customer relationship focused culture within the organization's system to achieve lasting benefits.

Many of Saudi SMEs have limited finance to invest in big campaign in advertising. This limitation is a hindrance to connect the clients. On the other hand, the system of measuring customer satisfaction is limited to ISO companies. It is not a discipline or norm of SMEs to measure their customer satisfaction in systematic way.

Maintaining the customer relation is one of the company's competitive advantages. It is more powerful of capturing new customer but seldom to Saudi Arabia SMEs to have data base of their customers to open continuous communication system to trace their valued customers. Sometimes, they are normally treated as one single buyer. This is a challenge to improve this limitation.

There is a business year-end practice within LEs in Saudi Arabia business culture to invite their whole customers in an open environment and share with them their performance, future and difficulties. They almost consider their customers as one of their stakeholders; their voice and need are incorporated in the corporative strategy and this will serve as their core goal to implement more rigorous strategies for the future performance of the organization. SMEs never adopt similar practice within their business context.

It is necessary to apply different strategies for the benefit of the corporative especially looking at the teamwork provided by each leader in an organization. As we all know that joint cooperation among members in a team is required when achieving common goals

for the organization. Each member is inclined to do their responsibility, and they are guided to shape a clear goal for their mission. This is the outcome of a good teamwork.

Teamwork is a transparent joint cooperative effort to work together as a team in achieving same goals especially for the good of the company. It is an important outcome and a condition in any corporative regardless to the scope of work for continuous improvement (Coyle-Shapiro, 1997). Scholtes (1992) argues that teams are needed for all organizations in order to work more flexible and develop mutual trust among members.

Teamwork is important in developing collective responsibility, develops a sense of ownership, provides additional communication channels between individuals, management, customers and suppliers, develops problem solving skills and facilitates awareness of improvement leading to behavioral and attitude change. (Barrie G. Dale, 2007)

Implementation and use of teamwork would result in producing appropriate related benefits:

a. Stay ahead of change
b. Gain new sources of expertise
c. Involve all who know something about the subject
d. Achieve consensus in controversial matters
e. Build commitment
f. Deal with problems that no one owns by organizational assignment
g. Balance vested interests
h. Avoid hasty decisions
i. Handle conflicting views
j. Develop and educate people through their participation.

There is a common underlying theme for teamwork and that is a willingness to cooperate.

Saudi Arabia business culture is made up of different nations. Each nation has its own language, values, attitude and beliefs. They are also different in knowledge, experience and interests. These characteristics hinder the creation of harmonized group of teamwork. Communication is the most common obstacle while working efficiently as a team. Leadership role and responsibility of the team remain vague throughout the given time frame. The output of their performance is adversely affected.

Senior manager of Saudi SMEs is less supportive in promoting team grouping strategy as illustrated by not making an initiative on the participation process, not setting the infrastructure for team functioning, and not assigning a meaningful and feasible task and insufficient authority or mandate. Those are critical impediments to achieve teamwork.

It has been noticed that employees of Saudi SMEs are not encouraged to show improvement through teamwork. Because of their inefficient implementation of teamwork, individuals working together in teams or groups toward common goals are generally less effective than individuals working alone.

Training is a fundamental channel in creating a team with principles and a method for action; a vision about what would be completed; a forum to discuss and learn with other teams; technical and emotional support; and a repertoire of procedures that enhanced communication and involvement. These are the positive responses in producing a stable and effective teamwork in a successful organization.

3-9 Summary

Today, as the world stands on the verge of major changes in the global economy, the environment is increasingly becoming an integrated market for goods and services; nations are becoming more and more competitive as they come to terms with the need to develop their private sector; and as the private sector becomes the true engine of economic growth, the critical role of small and medium enterprises (SME's) is beginning to attract the attention of policy makers and legislators worldwide. As Saudi

Arabia stands on the porch of its accession to the World Trade Organization (WTO), the first and foremost task is the creation of a strong framework that can nurture the creation and development of SME's.

Solutions can be brought out with government intervention and support. And government intervention and support can succeed with the active participation of the private sector including commercial banks, large enterprises, business service providers and other relevant stakeholders. A much needed public-private partnership must take shape if SME's are to be empowered. The government will have to face the challenge of persuading the private sector to buy-in on their intervention measures, and in turn the private sector will have to work hard in championing for the reasons as to why SMEs are essential for the country.

CHAPTER FOUR

RESEARCH METHODOLOGY AND FIELDWORKS

In this chapter, the research philosophy, different research methodologies and fieldworks are reviewed and explained. Different research approaches and the justification of using a particular approach are discussed. This is followed by discussing the research tools. The chapter ends by reviewing the result assessment procedure; reliability and validity.

4.1 Introduction

This chapter is concerned principally with the research methodology describes the research design and the field works in details. The research philosophy which is part of this chapter is discussed in relation to other philosophies. This chapter is also discussing the research strategy, including the research methodologies adopted. In a step toward the research goal, research objective and the quest for the solution for the research question, the researcher is critically reviewing research instruments utilized. As the main component of research methodology is data collection techniques and results assessment procedures, these are discussed at the end of this chapter.

In any research process, the research philosophy adopted contains important assumptions about the way in which world is viewed. These assumptions will underpin the research strategy and the methods chosen as part of that strategy. As Johnson and Clark (2006) note, the philosophical commitments have significant impact not only on what we do but how we understand what we are investigating.

In part, the philosophy adopted will be influenced by the research's particular view of the relationship between knowledge and the process by which it is developed. Not only will their strategies and methods probably differ considerably, but so will their views on what is important and, perhaps more significantly, what is useful.

In summary, the researcher agrees with Johnson and Clark (2006) who argue that the important issue is not so much whether our research should be philosophically informed, but it is how well we are able to reflect upon our philosophical choices and defend them in relation to the alternatives the researcher could have adopted.

4.2 Research Philosophy

The research philosophy (Figure 4-1), the over-arching term relates to the development of knowledge and the nature of that knowledge. The knowledge development may not be as dramatic as a new theory of human motivation. But even if the purpose has the relatively modest ambition of answering a specific problem in a particular organization it is, nonetheless, developing new knowledge.

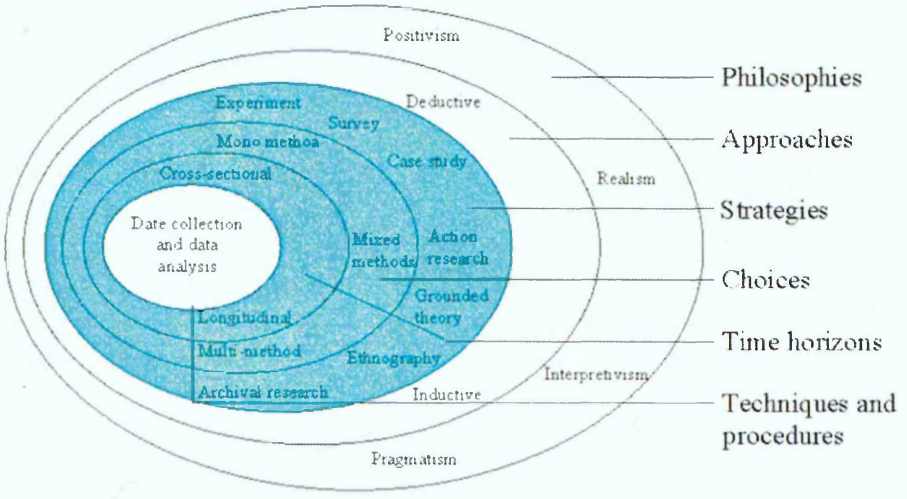

Fig: 4-1 The Research Process 'Onion'. Mark et al., (2000)

In research philosophy context, there are two main philosophies position; ontology and epistemology. Each contains important differences which will influence the way in which anyone think about the research process.

The term epistemology, which comes from the Greek word episteme, their term for knowledge, is the relationship between that reality and researcher. The term concerns what constitutes the acceptable knowledge in a discipline (what is known to be true) as opposed to doxology (what is believed to be true). The aim of research, then, is the process of transforming things *believed* into things *known*.

In the following section, the two major research philosophies positivist (sometimes called scientific) and inter-pretivist (also known as anti-positivist) (Galliers, 1991) are discussed.

I- Positivism

Positivists believe that an "objective" world and universe – an objective reality – exists. They are operated by laws of cause and effect. Consequently, reality can be studied using "objective" methods similar to that used in natural sciences so that we might predict and control them.

Neumann (2000) states that, positivism is the approach of the natural sciences. This short definition of positivism covers a lot of basic principles which underline the concept. Other definition developed by Orlikowski and Baroudi (1991) gives more understanding of the concept which states that positivist:

> *"...premised on the existence of a priori fixed relationships within phenomena which are typically investigated with structured instrumentation. Such studies serve primarily to test theory, in an attempt to increase the predictive understanding of the phenomena."*

The above definition advocates the existence of cause and effect within the case under study. This relationship is investigated with a structured instrumentation with no interference of the researcher in which advocates the value - free of the produced results and data do not change because they are being observed. The knowledge is accumulatively built and arrived through the gathering of facts – and only facts- that provide the basis for laws New knowledge is added to existing the knowledge and false hypotheses are eliminated (Denzin and Lincoln, 2000). This kind of knowledge can be law-like generalizations similar to those produced by the physical and natural scientists (Remenyi et al. 1998).

Positivism is an epistemological position that advocates the application of the methods of the natural sciences to the study a phenomena. An important component of the positivist approach to research is that the research is undertaken, as far as possible, in a value-free way and data do not change because they are being observed (Guba and Lincoln, 1994).

Positivism is characterized by the following principles:

1. Only phenomena and hence knowledge confirmed by the senses can genuinely be warranted as knowledge (the principle of phenomenalism).
2. The purpose of theory is to generate hypotheses that can be tested and that will thereby allow explanations of laws to be assessed (the principle of deductivism).
3. Knowledge is arrived at through the gathering of facts that provide the basis for laws (the principle of intuitivism).
4. Science must (and presumably can) be conducted in a way that is value free (that is, objective).
5. There is a clear distinction between scientific statements and normative statements and a belief that the former are the true domain of the scientist.

Typically, positivism inquiry uses quantitative method that include secondary data, laboratory experiment, field experiment, survey and case research that lend themselves to statistical analysis (Gill and Johnson, 2002; Benbas *et al.*, 1987). These methods are used to test hypothetical-deductive generalizations. Positivism paradigm emphasizes different quantitative analysis of strictly defined problems. The quantitative analysis aims to be predictive and extrapolative.

II- Interpretivism

On the other side of the river stands what is called anti-positivist researchers. This school of thought believes that the world can only "be understood from the point of view of the individuals who are directly involved in the activities which are to be studied" (Denzin and Lincoln, 2000).

The interpretive science school rejects the positivists' beliefs. It claims that the classical school of positivism is seriously misguided - particularly with regard to issues that are inherently subjective (sociology, psychology and much of business management). This concept is central to the notion of deducticism, which claims that generalizations can be made from a finite set of events in the past to predict future events.

The aim of interpretive research is to understand how members of a social group, through their participation in social process, enact their particular realities and endow them with meaning, and to show these meanings, beliefs and intentions of the members help to constitute their social action.

Within this school, the actor plays an important role in the investigation process. Interpretive philosophically differentiate between conducting research among people rather than objects.

The bonds between the investigator and what was being investigated is impossible to separate. The enquirer uses his/ her preconceptions in order to guide the process of inquiry (Remenyi et al., 1998). The interpretive perspective attempts to understand the intersubjective meanings embedded in social life... (and hence) to explain why people act the way they do (Gibbons, 1987). And thus, value free data cannot be obtained. The data collected is considered to be subjective and used to generate theories.

Understanding supply chain and distribution management issues have become a rich area of research interest (Simatupang et al., 2004). Gaining a better understanding, comprehension and meaning of the supply chain has led to the use of inductive qualitative methodologies to broaden the knowledge base. In short, it could be concluded that the supply chain research under the interpretivist doctrine is therefore the development of theories through explanatory methods rather than through the creation of generalization (Aastrup, 2008).

With regard to research into supply chain discipline, it could be suggested that positivism is relevant for getting an overview and for considering the broad structure of the implemented practices within SMEs whereas interpretivist is useful for finding out at the micro-level about the behavior of supply chain partners.

Gummesson (2000) outlined the characteristics of the two schools of thought as shown the following Table 4-1.

Table: 4-1 Schools of thought

Schools of Thought		
APPROACH	**CONCEPT**	**METHODS**
Positivism Science School	Social structure Social facts Objectivist Traditional	Quantitative Hypothesis testing
Interpretive science School	Meaning Social construction Subjectivist	Qualitative Hypothesis generation

Source; Silverman, 1993

The researcher intensively examines a particular case (Chapter 7), a single entity or a specific event with qualitative methods. Yet, there is no standard approach among qualitative researchers (Silverman, 1993). He claims that four primary methods are used by qualitative researchers:

1. Interview
2. Analyzing text and documents;
3. Observation
4. Recording and transcribing

Silverman (1997) points out, these methods are often combined. The multi-method approach is also stressed by Denzin and Lincoln (1994). The research made use all of the above methods in the case study.

4.3 Research Approach

There are two primary approaches to the conduct a research project and generate knowledge. They are quantitative and qualitative methods. Each of these has it strengths and weaknesses. Multiple research method bridges the gap and makes use of the strengths of each method.

Boyer and Swink (2008), argued that from a methodological standpoint, the right paradigm is one which incorporates multiple, complementary methodologies, in order to triangulate findings (Flynn et al., 1990) and to ensure that the weaknesses of any one methodology are offset by the use of complementary methodologies (McGrath, 1982) within a specific area of inquiry within any research field.

Accordingly, this study uses multiple research method; quantitative and qualitative methods to collect relevant data; self-administrated survey questionnaire and focus group interview in overcoming the 'method effect'. The section below discusses in detail how these two methods used in this research to collect the data required to answer the research problem.

I- Quantitative Research

The quantitative research methods were originally developed in the natural sciences to study natural phenomena (Myers, 1997) and it is based on a scientific method, a perspective based on positivism or objectivism. The goal of quantitative approach is to answer research questions or test hypotheses (Hopkins, 2000). It typically tends to learn 'what', 'how much' and 'how many' (Pinsonneault & Kraemer, 1993). In this study, the

qualitative methods are intended to answer the research question rather than testing hypotheses.

In quantitative research methods, the science (social or human) problem is composed of variables, measured with numbers, and analyzed with statistical procedures, in order to determine whether the predictive generalizations of the theory hold true (Creswell, 2005). It is appropriate where a researcher seeks to quantify relationships between variables of interest, in order to formulate and test hypotheses derived from theories that may therefore be either accepted or rejected on the basis of comparative and statistical analyses. In this way, a quantitative approach is inclined to be deductive.

Quantitative methods focus on the strict quantification of observations (data) and on careful control of empirical variables. It often incorporates large scale sampling and the use of statistical procedures to examine group means and variances (Ponterotto & Grieger, 1999). It stresses the measurement and analysis of causal or correlation relationships between variables (Denzin & Lincoln, 2000).

Moody (2002) states that the most common quantitative methods are:

- Experiment: This includes the application of a treatment and measurement of results (before and/or after). This is the only method that can demonstrate causal relationships between variables.
- Survey which includes cross-sectional and longitudinal studies using questionnaires or interviews for data collection with the intent of estimating the characteristics of a large population based on a smaller sample from that population, and
- Historical data: they are investigated to look for patterns in the data.

Each of the above method is particularly suited for obtaining a specific type of data.

Dilanthi et al., (2009) suggested that SCM studies can benefit from the strengths of quantitative methodologies. It eliminates the external factors and so the results gained is almost unbiased. The results are statistically reliable and determine if one idea is better

than the alternatives. A comprehensive answer is reached which can be generalized to the total population of the study. It also allows comparison and replication.

Despite the advantages of quantitative researches, there are some misgivings in using this type of research. Quantitative methods are fairly inflexible. With quantitative methods such as surveys and questionnaires, for example, researchers ask all participants identical questions in the same order. The response categories from which participants may choose are "closed-ended" or fixed. The advantage of this inflexibility is that it allows for meaningful comparison of responses across participants and study sites. However, it requires a thorough understanding of the important questions to ask, the best way to ask them, and the range of possible responses (Denzin, 200). The quantitative methodologies focus on the structural and technological aspects of SCM and overlook the importance of the social aspects of supply chains which considerably add to the complexity of supply chains, and which is considered to be a major weakness.

II- Qualitative Methods

Qualitative research is often treated as a relatively minor methodology to be used. Viewed from this perspective, qualitative research can be used to familiarize oneself with a setting before the serious sampling and counting begins (Silverman, 1993).

Denzin and Lincoln (2000) provide additional ammunition, claiming that many (traditionalists) regard qualitative researchers as soft scientists or even journalists. Qualitative research is described as unscientific, or only exploratory, or entirely personal and full of bias.

While it is important to take this criticism seriously, it is not enough to simply reject all forms of qualitative research. There is no reason why good, scientific research could not be performed using qualitative. However, they will not automatically provide better research than quantitative research (Alvesson, 1996). Both schools of thought have their strengths and weaknesses of forms and someone needs to try to use the most appropriate method given the particular research problem.

Silverman (1993) tired of the strong polarization between positivists (quantitative) versus interpretive (qualitative) approaches, argues that we need to understand the similar issues faced by any systematic attempt at description and explanation, whether quantitative or qualitative. The fundamental criteria for good research should not differ between the two.

Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomenon. Miles & Huberman, (1994) define qualitative methods as a set of data collection and analysis techniques that emphasize the fine grained, the process oriented, and the experiential and that provide a means for developing an understanding of complex phenomena from the perspectives of those who are living it. Other scholars like Burns & Grove (1998) state that qualitative research refers to inductive, holistic, subjective and process-oriented methods used to understand, interpret, describe and develop theory on a phenomenon or a setting and is a systematic, subjective approach used to describe life experiences and give them meaning.

Qualitative methods are most often used for theory building. In these cases, a phenomenon exists that is poorly understood, so poorly that the relevant variables and linkages cannot be specified a priori (Pamela, 2004). In these circumstances the researcher would immerse herself in the phenomenon of interest, interviewing participants, observing activities within the organization, and gathering archival information in an attempt to build a better understanding.

While most often used for theory building purposes, qualitative methods can also be used to test theory. For example, Barr et al. (1992) conducted a qualitative analysis of archival documents from two companies to test their hypotheses about the relationship between environmental change, management beliefs, and the timing of strategic change. Their results did support their hypothesis that the organization in which management more rapidly changed their understanding of the environment also was the first to change its strategy.

Using qualitative research method in SCM provide the opportunity to identify and explain complex relationships without having to pre-specify either the variables

involved, or the nature of the relationship between them. The researcher will develop more understanding of the phenomena under investigation as he or she immersed deeply in the problem thruogh using different data collection techniques available. Such understanding will not be available through using survey questioners only.

Qualitative methods encompass a number of data collection techniques including Pamela (2004):

- Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework model;
- Case study research - a case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context;
- Ethnography - the ethnographer immerses her/himself in the life of people s/he studies and seeks to place the phenomena studied in its social and cultural context.
- Participation and observation, interviews, and analysis of archival information such as documents, photographs, and video and/or audio recordings.

Beside the advantages that qualitative approach offers, it received numbers of criticism. Golden-Biddle & Locke (1997) stated that most qualitative methods lack a standardized protocol for analyzing data and that the results of qualitative research are based upon the subjective interpretation of the researcher. Other criticism is made to the data coding protocols. Strauss & Corbin, (1998) argued that these protocols are purposely broad to allow the coding process to be adapted to the situation at hand. The emphasis on basing conclusions upon the researcher's interpretation of the data, rather than on a mathematically rigorous test of significance as in the case of quantitative methods, leads some to question the validity and reliability of the results (Pamela, 2004).

The following Tables 4-2 and 4-3 summarize the strength and weakness of each method. They are specifically designed to aid in the construction of combination of qualitative and quantitative research. After determining one's research question(s) one can decide whether mixed research offers the best potential for an answer; if this

is the case, then one can use the tables as an aid to help in deciding on the combination of complementary strengths and non-overlapping weaknesses that is appropriate for a particular study (Johnson; and Onwuegbuzie 2004).

Table: 4-2 Strengths of Quantitative Methods

- Testing and validating already constructed theories about how (and to a lesser degree, why) phenomena occur.
- Testing hypotheses that are constructed before the data are collected. Can generalize research findings when the data are based on random samples of sufficient size.
- Can generalize a research finding when it has been replicated on many different populations and sub populations. Useful for obtaining data that allow quantitative predictions to be made.
- The researcher may construct a situation that eliminates the confounding influence of many variables, allowing one to more credibly assess cause-and-effect relationships.
- Data collection using some quantitative methods is relatively quick.
- Provides precise, quantitative, numerical data.
- Data analysis is relatively less time consuming (using statistical software).
- The research results are relatively independent of the researcher.
- It is useful for studying large numbers of people.

Weaknesses of Quantitative Methods

- The researcher's categories that are used may not reflect local constituencies' understandings..
- The researcher may miss out on phenomena occurring because of the focus on theory or hypothesis testing rather than on theory or hypothesis *generation* (called the *confirmation bias).*
- Knowledge produced may be too abstract and general for direct application to specific local situations, contexts and individuals.

Table: 4-3 Strengths of Qualitative Methods

- The data are based on the participants' own categories of meaning.
- It is useful for studying a limited number of cases in depth.
- It is useful for describing complex phenomena.
- Provides individual case information.
- The researcher can study dynamic processes (i.e., documenting sequential patterns and change).
- Can conduct cross-case comparisons and analysis.
- Provides understanding and description of people's personal experiences of phenomena.

Weaknesses of Qualitative Methods

- Knowledge produced may not generalize to other people or other settings (i.e., findings may be unique to the relatively few people included in the research study).
- It is more difficult to test hypotheses and theories.
- It generally takes more time to collect the data when compared to quantitative research.
- Data analysis is open time consuming.
- The results are more easily influenced by the researcher's personal biases and idiosyncrasies.

Sources; Denzin, 200

III- Combination of Methodology

In the real world, supply chain is a complex phenomenon that could not be solved with a single methodology. Thus, multiple approaches are required in order to develop a holistic understanding of supply chain management phenomena (Näslund, 2002). It is only with multiple perspectives that true picture of a problem could be visualized and understood.

Dunn (1993) suggested that, it is trend of the researcher to use multiple methods in many research disciplines and supply chain is not exceptional. Näslund (2002) put it: *"...it will be hard to develop any research field if all researchers belong to the same paradigm and culture, and do the same kind of research with the same kind of research methods"*. Thus, to maintain the integrity of the research, it is advisable to use of multiple complementary methodologies in our own research.

Boyer and Swink (2008) argued that from a methodological standpoint, the right paradigm is one which incorporates multiple, complementary methodologies, in order to triangulate findings (Flynn et al., 1990) and to ensure that the weaknesses of any one

methodology are offset by the use of complementary methodologies (McGrath, 1982) within a specific area of inquiry within any research field. As this study concern, the researcher integrated the both methodologies in reaching the aim and objectives of this research work.

4.4 Data Collection Methods

In the process of solving any research problem, collecting the proper data is a must. In the research field, there are two main data collection. These are quantitative and qualitative. The use of each method lies in the approach and the types of questions they seek to answer. The main data collection technique under this approach is survey research methods, while interview technique is the main method under the qualitative research method. In this section, the data collections for the both research methods are discussed in more details.

4.4-1 Quantitative Research Methods Data Collection

In the following section, the researcher will discuss the data collection protocol of quantitative research methods.

I- Survey Research Methods

Survey research methods are found to be the most suitable tool for obtaining a view of situations and practices at a specific point in time, through the use of questionnaires or interviews (Galliers, 1991). It involves the collection of information from a large group of people or a population (through mailed questionnaires, telephone calls, personal interview, etc.) about themselves or about the social units to which they belong (Rossi *et al.*, 1983), in very economical way. The survey sampling process determines information about large populations with a known level of accuracy (Rea and Parker, 1992).

The classical school holds that survey research methods, which have been known since the 1950s and have continued to evolve since that period, generate a detailed and quantified description, a precise map and/or a precise measurement of potential. This is

accomplished by following well established methods for developing the research plan, the survey instrument, the measurement device(s), the sampling plan, the collection/coding/analysis of data and finally, the way results are reported (Daniele et al., 2002). From the result, deductions are made via quantitative analysis regarding the relationships between variables that are measured (Galliers, 1991).

Survey research methods can be studied in details through the following items:

I-1 Characteristics of Survey Research Methods

Manoj and Varun (1998) identified three distinct characteristics for survey research. First, it involves collection of information by *asking people* for information in some structured format. Second, survey research is usually a quantitative method that requires standardized information in order to define or describe variables, or to study relationships between variables. Third, information is gathered *via a sample*, which is a fraction of the population, with the need to be able to generalize findings from the sample to the population. Given these three characteristics, it is easier to distinguish survey research from other field-based methods like case studies.

I-2 Advantages of Survey Research Methods

In their discussion on the advantages of survey research methods, Marshall and Ross (1995) stated that these include their accuracy in measurement. Survey results can be generalized to a large population within known limits of error. Other scholars (Sekaran, 2000; Weiers, 1988; Zikmund, 2003) identified many more advantages for survey research methods.

I-3 Types of Survey Research Methods

Survey research methods often distinguish between exploratory, confirmatory (theory testing) and descriptive survey research (Filippini, 1997; Malhotra and Grover, 1998).

The justification for selecting the survey method as a tool for data collection in this study is that it was the most appropriate mode of inquiry for the organizations under investigation since the sector under study is too large.

I-4 Questionnaires Design

According to Dillman (2000), self-administered questionnaires are an accepted social science research instrument. They are one of the oldest methods in the researcher's repertoire, and the method with which the general public is most familiar (Dane 1990). Often they are the only feasible way to reach a number of reviewers large enough to allow statistically analysis of the results.

In the questionnaires method of survey, the questionnaires may be mailed to the respondents, or delivered in person. Both methods were used in this study. The targeted respondents fill the same preprinted list of questions unaided. In the questionnaire, the respondents themselves answer the questions without the present of interviewer around; the questionnaire in this case is called self-administered.

Sufian (1990) classifies questionnaires into two types: structured and unstructured questionnaires. A completely structured questionnaire is one in which all respondents are asked the same set of predetermined questions with fixed wording and sequence.

Unstructured questionnaires on the other hand, although seeking standardization in the sense of obtaining true variations among the respondents through their responses, are based on the assumption that it is not possible to frame the same set of predetermined questions that have identical meanings for extremely heterogeneous respondents.

The questionnaire was a result of comprehensive literature review and the study of an existing available one with similar purpose. The questionnaire was carefully studied to avoid unnecessary question that may lead to ambiguity or consume a lot of time to answer.

The constructed survey was selected towards answering the problem statement of this research. Questions under each construct were worded to cover certain construct comprehensively. The survey was composed of two sections as follows:

The first section was designed to solicit basic data on the general characteristics of the company such as their industry type, sales turnover, and number of employees. This information was collected to enable the classification of responses by industry and size of the organizations participating. The second is concerned on the current state of supply

chain. In total, the survey proposes __ questions.

I-4.1 Types of questions

There are many different types of questionnaire. They are;

- Contingency question
- Matrix questions
- Scale questions
- Open ended questions; and
- Closed ended question

All questions in this study were close-ended. As such, the survey employed three question formats:

1) Yes/No;
2) Five-point Likert scales; and
3) Check list types of questions.

The question of each item was categorized in the following certain rules:

- The questions should not lead to a stereotype answer, short and simple enough to be completed in short time, reduce the ambiguity and complexity of the questions to overcome the possibility of obtaining lido not know" answers, and the vocabulary used was intended to match the educational and experiential background of the respondent.
- The question under each item is measured with five points. Likert Scale indicates varying degrees of agreement to statements about these variables. In this measurement, the most important was awarded 5 points, natural was given 3 points and least important was awarded 1 point under same scale.

A common criticism of mail surveys is that they often have low response rates (Benson, 1946; Robinson, 1951). Low response is the curse of statistical analysis, and it can dramatically lower confidence in the results. While response rates vary widely from one questionnaire to another, well-designed studies consistently produce high response rates.

Questionnaires have advantages over some other types of surveys in that they are considerably cheaper to administer and conduct than other forms of survey research. It is also, relatively easy to cover a large geographical area, obtain a listed population and locate respondents, and can avoid interviewer bias and distortion. Questionnaires permit the respondent more time for thought, allowing answers to be more realistic than other type survey methods (Dillman 2000).

The most important limitation of self-administered structured is that the response rate tends to be low, especially when the questionnaire is too long or is complicated to complete, the subject matter is either not interesting to the respondent or is perceived as being of a sensitive nature. Furthermore, Davidson (1970) notes that:

> Left to a respondent to interpret questions, record answers and return a questionnaire, the chances of getting the required volume and accuracy of replies are lesser than other forms of data collection.

I-4.2 Construction of Questionnaire

A large part of the success in a given research depends on how objectively the instrument has been devised, Sufian (1990|). The first step in designing a questionnaire is to decide the variables directly related to the problem. Other variables, such as, intervening variables, background variables, etc., are also of concern. Having created the exhaustive list of all variables necessary for the research, the next task is to frame questions to obtain information on those variables. In addition to the variables related to the problem, the researcher has to consider the following characteristics in designing the questionnaires:

a- Instructions

It is important to include in the questionnaire instructions for the respondents as to how to fill it.

b- Questionnaire Length

A questionnaire should cover only those variables that are absolutely necessary for the research being pursued.

c- Question Content

It is important that the questions make the respondents feel that the contents are, in one way or another, relevant to them. If the contents are such that they do not concern most of the respondents, it is unlikely that they will care for such matters and the responses will cease to be practically useful.

I-5 Pre- Testing Surveys

An important aspect of the quality of survey research is "The *pre-test,*or preliminary test. It comes at the end of survey questionnaire design. It is essential to the credibility and success of survey process.

Questionnaire pre-testing has merits in a sense that identifies questions that respondents have difficulty understanding or interpret differently than the researcher intended.

Pre-tests typically consist of administering the draft questionnaire to a small sample of respondents (10-25). Ideally, the test should be done on the same kinds of respondents whom will include in the main study. The aim is to describe problems encountered and the impressions of the respondents' experiences in answering the questions.

Often, the pre-test is administered by the most experienced interviewers because they can do a good job with an unfamiliar questionnaire and can provide useful feedback on questions that do not work or on problematic sequencing of questions.

Finally, it is important to note that pre- testing almost always results in a general improvement of questionnaire.

As this study concern, a small sample group of practitioners and experienced academics in supply chain management were selected for the careful review of the instrument. The mailing list for the pilot study was randomly selected from the full mailing list. They were given a copy of the survey and asked to answer it as soon as possible. The researcher received 11 out of total 32 sent packages. This resulted in 34% of usable

survey.

The group was asked to highlight any ambiguity or uncertainty with the question wording, structure, design, comprehension, layout and/ or sequence. Upon the completion of the survey, a short meeting was arranged to discuss the concern areas where improvement could be made like the sequence of questions and some terms used in the questionnaire.

The panel found no major problems with the response format, directions, or other survey procedures. On the other hand, the question that consistency misinterpreted was refined and other minor modifications were made to ensure that the final version of the survey was easily read and understood. Furthermore, several personal questions were deleted to stress out the confidentiality of data, and to make it difficult in identifying the source.

The new version of the questionnaire was made in receiving the consideration of the comments raised by the reviewers. This effort was made to help reducing the number of missing items and to accommodate further input from the pilot study.

As this step finished, the survey was then submitted to the director of studies for final evaluation prior to final printing and distribution.

I-6 Cover Letter

Virtually all mailed questionnaires are accompanied by a cover letter. The cover letter is an essential part of the survey. To a large degree, the cover letter will affect whether or not the respondent completes the questionnaire. The importance of the cover letter should not be underestimated. It is important to maintain a friendly tone and keep it as short as possible (Goode and Hatt, 1962). It provides an opportunity to persuade the respondent to complete the survey. However, letters vary widely in terms of length, nature of appeal, and whether they are on a separate page or reproduced as part of the questionnaires.

The central issue in discussing cover letter is whether to personalize cover letters (i.e., the respondents name appears on the cover letter) or an impersonal letter is sufficient or perhaps even preferable. Some researchers have found that personalized cover letters

can be detrimental to response when anonymity or confidentiality is important to the respondent. However, some researchers have found that personalized cover letters with hand-written signatures helped response rates (Carpenter, 1974). Others, have reported that personalization has no effect on response (Forsythe, 1977).

The cover letter should address seven items (Walonick, 1993):

1. Briefly describe why the study is being done. In other word, statement of purpose and importance.

2. Identify the sponsors/ endorsers.

3. Mention the incentive.

4. Mention inclusion of a stamped, self-addressed return envelope.

5. Encourage prompt response without using deadlines.

6. Describe the confidentiality/anonymity policy.

7. Give the name and phone number of someone they can call.

Other investigators found the following are important to be included too.

1. Identification of why they should complete the questionnaire.

2. The name and phone number of a person they can call with questions.

3. Statement of appreciation

4. An offer of a summary of results.

I-7 Reliability and Validity Assessment

Measurement, by definition, is simply the assignment of numbers to events, objects or individuals, according to specified rules. Whether the attribute being measured is physical or psychological, "hard" or "soft", the focus of measurement is necessarily on the "something" that is measured.

The goodness of the measurement or the truthful of the measurement results is a corner stone in the quality of measurement process and therefore to the conclusion made. The assessment of the measurements can be achieved by considering the reliability and validity of the data under research. These two concepts of assessment are discussed in the following section in more detail.

1- Reliability

The term 'Reliability' is a concept used for testing or evaluating all kinds of research methods; quantitative, qualitative or others. Reliability is a kind of assessment concept that has issues of consistency of measures (Bernard, 2000). It is an indicator for measuring the homogeneity of the scale items in the same construct (DeVellis, 1991; Hinkin, 1995). In other word, it is concerned with minimizing the errors and biases in the study so that if another researcher duplicated the same procedures using the same case study, then the results and conclusions would ideally be the same (Yin, 1994). Conceptually, the reliability reflects how well the observed scores are related to the true scores. The research work has high acceptance when it has high degree of reliability.

As in most of empirical studies, Cronbach's Alpha (Terence Jackson, 2001) was found to be the most acceptable statistical technique to measure the reliability of a given construct. The Crobach's Alpha coefficient (Cronbach, 1951; Nunnally, 1967) varies between 0 (no correlation and therefore no internal consistency) and 1 (perfect correlation.. Typically, reliability coefficients of 0.70 or higher were found to be the most acceptable cut off value (Nunnally, 1978). The reliability is affected by number of items in a scale and sample size (Hayes, 1992). Therefore, permissible alpha values can be slightly lower (0.60) for newer scales Nunnally (1978). The Crobach's Alpha coefficient with a value of (0.7) is considered in data analysis as accepted cut off value in this study.

2- Validity

The traditional criteria for validity find their roots in a positivist tradition, and to an extent, positivism has been defined by a systematic theory of validity. Within the positivist terminology, validity resided amongst, and was the result and culmination of other empirical conceptions: universal laws, evidence, objectivity, truth, actuality, deduction, reason, fact and mathematical data to name just a few (winter, 2000).

In order to understand the concept of "validity", it is essential to review the definition given by leading authors Champion (1976). 'The measure that an instrument measures what it is supposed. In other words, does the research instrument allow you to hit "the bull's eye" of your research object?

Validity concerns the crucial relationship between concept and indicator. Unlike reliability that focuses on the performance of empirical measures, *validity* is usually more of a theoretically-oriented issue because it inevitably raises the question, "valid for what purpose?". *Validity* is crucial to an instrument's credibility; it is an indication that the instrument is indeed measuring what it was designed to measure and that it is measuring it accurately.

4.4-2 Quantitative Research Methods Data Collection

In the following section, the researcher will discuss focus group as data collection protocol of qualitative research methods.

I- Focus Group

In order to meet the research objectives and assessment of supply chain house framework model, the researcher coordinated and conducted a case focus group session to explore the suitability and applicability of the framework model for SMEs manufacturing sectors.

A focus group is, according to Lederman (Thomas et al. 1995), 'a technique involving the use of in-depth group interviews in which participants are selected because they are a purposive. It is a qualitative research method to seek and gather information that is

beyond the scope of quantitative research. Mail and telephone surveys are concrete examples in this method. The term "focus group" is often used to describe many types of group discussions. Focus group research, however, is a true research method. As such, it uses a fairly standard methodology.

Although it is not necessary the representative in the sampling of a specific population, the group is being 'focused' on a given topic'. Participants in this type of research are, therefore, selected on the criteria that they would have something to say on the topic (Richardson & Rabiee, 2001).

The purpose of the methodology is to make sure that the information is not collected in a biased manner by the researcher, is a true representation of participants' feelings and beliefs, and is reproducible. In other words, if another researcher conducts the same focus group, he or she might obtain similar results.

In focus group research, participants usually bring up issues and concerns outside the prepared question path. For that reason, focus group research is useful for issues identification, and to determine areas needing further research.

Focus groups provide insights on how people think and provide a deeper understanding of the phenomena being that is being studied. While a valuable research tool, **surveys** generally ask closed-ended questions that may limit the feedback that can be gained from a respondent. A scheme to gain more in-depth information and to supply a survey is the interview method.
Group interview is the primary focal point in facilitating the interview in order that the researcher can economically capture deeper information than individual interviews.

Focus groups have the following benefits:

- ***Economical***: It is more reasonable than individual interviews because it can be an expensive proposition that can exceed the available resources;

- ***Group interaction***: It is between members of the target population during focus groups that may encourage participants to make connections in various concepts through discussions that may not occur during individual interviews, and

- ***Non-verbal communication:*** It is also the data that can be captured in focus groups. Participants who are in the focus group may respond differently to a topic.

- Focus group discussions are a ***flexible*** tool for exploring respondent awareness, behavior, concerns, beliefs, experiences, motivation, and future plans.

- Focus group offers an ***exploratory, formative, and "information-rich"*** data.

o Focus Group Methodology

This brief methodology outlines the five-stage process in conducting the focus groups field work and reporting on the results. The five stages are:

I. Study Purpose
II. Methodology
    a. Conceptualization
    b. Process flow
III. Facilitation
    c. Preparation
    d. Pre-Session
    e. Session
IV. Data Analysis
V. Reporting

Using this five-stage process will contribute to the completion of a feasible focus group, and this will serve as an introduction to the focus groups. The first two stages belong to the methodology design while the last three stages belong to the field work. The following is the detail description of the five stages process.

I- Study Purpose

As with any research studies, the first stage in conducting a quality focus group is to define the study purpose. This is critical as it defines how all subsequent activities will proceed. Sample purposes for a focus group include:

- Exploration: *Finding out an issue of importance from the target of population*

- Program Development: *Asking members of the target population on what type of Activities that they might enjoy*
- Systematic Research: *Collecting in-depth data on specific research questions*
- Evaluation: *Collecting in-depth data on specific evaluation questions to determine program success or progress*

II-- Methodology

This methodology has two elements: 1) Conceptualization and 2) Process Flow. The conceptualization of a focus group follows a process similar to a classic research study.

II-1 Conceptualization

Once the study purpose has been defined, the study population (participants) and sample have to be defined. The participants reflected a convenient sampling. They were recruited on the basis of being holding a managerial position in their organization. The investigators interviewed a total of 13 participants in the focus groups, which included all departmental managers of the case organization with a representative of its supplier and customer. This represents a 100% of the participant called for the focus group. Table 4-4 below shows a composition of the focus groups with their years of experience. It consists of 13 participants. Traditionally, focus groups are up to ten participants considered ideal & giving a variety of viewpoints while making sure that everyone has a chance to participate. In this case, the research aimed to include all participants that have a key role in the topic investigated. Excluding any of the above participants believed that it resulted in missing key information.

Table : 4-4 Focus Group Participant Demographics

S/N	POSITION	YEARS OF EXPERIENCE
1-	General Manager	15years
2-	VP Operation	15 years
3-	Purchasing Manager	9 years
4-	Production Manager	12 years
5-	Quality Assurance Manager	10years
6-	Marketing Manager	8years
7-	Customer Service Manager	5years
8-	IT Manager	9years
9-	Logistic Manager	11years

10-	Cooperate Strategy Manager	5years
11-	Finance Manager	7years
12-	First Tier Supplier	7years
13-	Direct Customer	5years

Participants were given a stipend for attending the focus group. The use of a stipend usually insures better attendance, because it creates a "contract" in the mind of the participant. Refreshments of some type were served to create an informal and comfortable atmosphere.

The question path is open-ended and it is designed to gather ideas and opinions that are outside the scope of prepared questions. Yes/No questions or questions that are too specific can limit discussion and decrease the value of a focus group.

The questions are put into a logical flow and develop prompts for each question. A prompt is a question that can facilitate discussion if there isn't a good response to the initial question. It also develops questions that might explore an issue more in depth. After finalizing the questions, review the questions to ensure that they are aligned with the study purpose. Sometimes in the methodology stage, a research team may trap in developing questions and ideas that the final questions could lose their alignment with the study purpose. As a quality check, it always takes a step-back to ensure that the questions that are being asked will inform on the study purpose.

II-2 Process Flow

The logistics are often the most time-consuming element in preparing to conduct a focus group. Below is a suggested schedule for planning a focus group:

- Develop the Study Purpose
- Identify the Participants
- Develop Participant Contact List
- Select the Facilitator
- Question Development
- Develop the Script

- Pilot test questions and script.
- Invite Participants
- Verify Invitation to Participants
- Finalize Room Arrangements
- Reminder Call to Participants
- Organize all Needed Materials

Conceptualizing the focus group and managing the logistics will prepare the focus group for Stage Three.

III- Facilitation

The general components of the facilitation stage are preparation, pre-session, and the session itself. There are certain factors to acknowledge for each component that will contribute in conducting a successful focus group.

a) Preparation

With the logistics completed, the research team can prepare for the focus group. Wherever possible, there should be a focus group team. The team should have at least two people. One person is the facilitator and the other is the note taker. It is important to have a note taker to record the focus group feedback. It can negatively crash the discussion if the facilitator will stop to jot down important notes. A focus group is a conversation and this should not be impeded by someone stopping to take notes.

Preparation involves the facilitator committing the questions to memory. The script can be used for verification but the facilitator needs to keep the conversation flowing and reading questions can distract from the conversation.

b) Pre-Session

The time before the focus group starts is an important opportunity to become familiar with the group dynamics. Engaging in small-talk prior to the session is important to avoid the session topics. This can help the participants to feel more comfortable around the facilitator and make engaging the group an easier process. Use the pre-session as an opportunity to begin in understanding the group and will bring good result in the focus group.

c) Session

After the pre-session, the facilitator will continue to open the session by requesting the participants to introduce themselves.

After the introduction, proceed through the questions. At the end of the discussion, close the session using the text from the script. The questions are important but it is merely flexible. If an issue seems critical to the participants and it aligns with the study purpose, explore it more in depth.

IV. Data Analysis

Qualitative research and, in particular, focus-group interviews generate large amounts of data. The data analysis aims to reduce data Robson (1993). Yin (1989) points out that data analysis consists of a number of stages, i.e. examining, categorizing and tabulating or otherwise recombining the evidence, in order to address the initial goal of a study.

The process of qualitative analysis aims to bring meaning to a situation rather than the search for truth that focused on by quantitative research. Strauss & Corbin (1998) describe analysis as '. . . the interplay between researchers and data', acknowledging that there is an extent of subjective selection and interpretation of the generated data.

The main source of data analysis is the recorded spoken language derived from the interview; nevertheless, reflection about the interview, the settings and capturing the non-verbal communication expressed by the member of the groups would add a valuable dimension to the construction and analysis of data. This record could be in the form of an audiotape or a videotape. It is recommended that a reflective diary should be kept by the facilitator or moderator and that observational notes should be written immediately after each focus-group interview.

The process of data analysis begins during the data collection and just after focus group closure, by skillfully facilitating the discussion and generating rich data from the

interview. Comprehensive note taking and summarization of the discussion with the participants during the focus group session will facilitate more efficient analysis.

For each focus group question, summarize the "big ideas" or "themes" that were discussed, by listening to tapes, reading several times the entire transcripts and reading the observational notes taken during the interview and summary notes written immediately after the interview. This process facilitates a deeper understanding on the study topic.

V. Reporting

The reporting stage will tie up all together the previous stages into a coherent whole. The research team has various decisions in making this stage as the most important output coming from the audience.

4.5 Summary

In summary, any research process, the research philosophy adopted contains important assumptions about the way in which world is viewed. These assumptions will underpin the research strategy and the methods chosen as part of that strategy.

This chapter has dealt with issues related to research philosophical considerations such as research approach and strategy in detail.

This chapter discussed the research strategy/methodology that adopted for this research work which includes research design and the fieldwork that used for collecting data for the multiple research method; quantitative and qualitative. The survey questionnaires and focus group both were used for the multiple research methods.

The execution of survey research method included the following steps:

1) Selection of study area was done through simple random sampling.

2) Respondents were selected by using Convenient Sampling.
3) Data collection was carried out by email method through well- structured questionnaire.
4) The ambiguity or uncertainty with the question wording, structure, design, comprehension, layout and/ or sequence was reduced by pilot survey.
5) Reliability of data and response rate were increased through continuous follow.

On the other side, the researcher adopted focus group research method technique under the qualitative research method to validate the framework model developed in chapter seven. Focus groups are valuable research tools and can capture deeper information that will help to better understand the subject under investigation. The use of focus groups provided the investigator with access to groups of individuals who were the key players in the company. This section discussed the theoretical concept, the role and methodology of focus-group interviews.

The interview discussions revolved around the implementation assessment of the proposed framework model "Supply Chain House" which was developed to improve the SMEs performance. The focus group interview was guided by Krueger (1994) and Ritchie & Spencer (1994) framework analyses. The analysis of qualitative data collected during the interview, raised up numbers of recommendations and suggestions to the framework model and to the implementation challenges.

The focus groups complemented the visited site during the facilitation of the study, it represented opportunities to gain deeper information about the company, its operation and its relation with their suppliers and customers, and the visit provided opportunities to learn more about the implementation challenges associated with the capacity of SMEs.

Next chapter will deal with the data analysis of the survey questioners and summarizes the findings. It starts with the respondents' demography analysis, followed by the detailed statistical analysis of supply chain dimensions.

CHAPTER FIVE

FIELDWORKS DATA ANALYSIS

5-0 Introduction

This chapter concerns with the data analysis and interpretation. Following the data collection, the data preparation process suggested by Malhotra (1993) and Churchill (1999) was implemented to ensure data was cleaned before performing further statistical analysis. The major analytical tasks in the data preparation process include questionnaire checking, editing, coding, and tabulation.

To analyze the empirical data, several statistical methods were employed. First, Cronbach's Alpha and Corrected Item-to-Total Correlations were used in assessing the internal consistency of each construct. The mean was used to find out the trend of each attribute under each construct. Illustration of data was made to give understanding for the data trend.

Cronbach's α (Alpha) is a coefficient of reliability. It estimates the consistency (or repeatability) of the survey instrument measurement for a given concept. It is an indication how well a set of items measures the same concept. Theoretically, alpha varies from zero to 1, including negative values, although only positive values make sense. Higher values of alpha are more desirable. As a rule of thumb a reliability of 0.70 or higher is required.

Cronbach's Alpha can be written as a function of the number of test items and the average inter-correlation among the items. Below, for conceptual purposes, is the formula for the standardized Cronbach's Alpha:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

Where:

N: is equal to the number of items,

c-bar: is the average inter-item covariance among the items and

v-bar: equals the average variance.

Corrected Item to-Total Correlation test is performed to check if any item in the set of tests is inconsistent with the averaged behavior of the others, and thus can be discarded. The analysis is performed to purify the measure by eliminating 'garbage' items prior to determining the factors that represent the construct, Churchill, G.A., (1979), that is, the meaning of the averaged measure.

It is called Corrected Item to-Total Correlation because the total is not the sum of all item scores, but the sum of item scores without including the item in question.

Corrected Item to-Total Correlation test formula can be written as follow:

$r = [\Sigma XY/n - (X-)(Y-)]/(\sigma x \times \sigma y)$,

Where:

$\Sigma XY/n$ = the mean of the sum of cross-products of variable X (item score) and variable Y (total score),

$X-$ = the mean of the scores on the X variable,

$Y-$ = the mean of the scores on the Y variable,

σx = the standard deviation of scores on the X variable, and

σy = the standard deviation of scores on the Y variable.

Data was analyzed using SPSS version 18. SPSS stands for Statistical Package for the Social Sciences. It was written in 1968 by Stanford doctoral candidate Norman Nie. SPSS is commonly used in the Social Sciences and in the Business world.

In this research work, the researcher used SPSS statistical package software for the purpose of data analysis. It is general statistical software tailored to the needs of social scientists and the general public. It provides over 50 statistical processes, including regression analysis, correlation and analysis of variance. Compared to other software, it is more intuitive and easier to learn; the trade-off is less flexibility and fewer options in advanced statistics than some other statistical software like S-Plus, R and SAS.

SPSS software package is Windows based program that can be used to perform data entry, organizing and analyzing data and to create tables and graphs. Theoretically,

there is no limit to the size of data files, so large amounts of data can be handled, that cannot be handled in different program.

This chapter starts with given a brief description of the sample characteristics for the study sample, with the respect to number of employees, position of company in the supply chain, and the primary type of industry. The supply chain dimensions were reviewed and analysed. Each section of this chapter is dealt with one of the supply chain dimensions. There are seven supply chain dimensions in this study: 1) Manufacturing Strategy, 2) Supplier Relationship Strategy, 3) Customer Relationship Strategy, 4) Logistics Strategy, 5) Information Strategy, 6) Supply Chain Initiatives, and 7) Performance Measurement Strategy. The results are shown in two tables. The first table presents the Cronbach's alpha and Corrected Item to-Total Correlation whereas the second table shows the descriptive statistics analysis. Finally, the descriptive statistics analysis is shown in graph presentation. The data then interpreted and discussed.

The next chapter, Chapter Seven, will deal with developing a framework model that support SMEs in their transition to world class supply chain management. The proposed framework model then will be put under the examination with group of consultants and managers in focus group interview.

5-1 Executive Data Summary

In the following tables, the author presents the executive data summary in two different Tables (5-1, 5-2). The first Table 5-1 summarizes the Crombach's Alpha coefficient and CITC values of the main research constructs and for the related variables. The second Table 5-2 presents the statistical descriptive analysis which shows the mean value of each construct.

Table 5-1: The result of Crombach's Alpha and CITC values

The result of Crombach's Alpha and CITC values			
CONSTRUCT	**VARIABLE**	CRONBACH ALPHAα	**C-I-TC**
MANUFACTURING STRATEGY		**0.843**	
	Quality		.679
	Cost		.698
	Delivery		.746
QUALIY		**.79**	**.679**
	quality approach		.659
	Implementation of TQM		.594
	Continuous improvement		.559
	Benchmark		.491
	Quality awareness		.544
COST		**.66**	**.698**
	Sourcing cost		.444
	Manufacturing cost		.525
	Sales cost		.474
	Returns and after sales cost		.32
DELIVERY		**.78**	**.746**
	Delivery Products needed		.595
	Delivery on time		.546
	dependable delivery		.529
	shipment Tracking		.542
	Short order-to delivery time		.618
SUPPLIER PARTNERSHIP STRATEGIES		**0.675**	
	Suppliers selection		.440
	Suppliers involvement		.434
	Suppliers base reduction		.482
SUPPLIERS SELECTION		**.683**	**.440**
	Trust		.435
	Quality		.568

	Delivery		.442
	Price		.315
	Technical competence		.459
SUPPLIERS INVOLVEMENT		**.846**	**.434**
	Product Design		.645
	Continous Improvement		.755
SUPPLIERS BASE REDUCTION		**.711**	**.482**
	rely on a small number of suppliers		.556
	get multiple quotations		.548
	drop suppliers for price reasons		.645
	drop suppliers for quality reasons		.621
CUSTOMER RELATIONSHIP STRATEGY		**.732**	
	Customer Relation Strategy		.566
	Customer Supplier Relationships		.643
CUSTOMER RELATION DIMENSION		**.652**	**.566**
	Setting business ethic jointly		.503
	Measuring Customer Satisfaction		.549
	Determine future customer expectation		.487
	Having joint venture improvement program		.443
CUSTOMER SUPPLIER RELATIONSHIPS		**.855**	**.643**
	Conveying accurate information		.567
	Developing and maintaining a positive……		.694
	Using compatible technologies		.744
	Opening lines of communication….		.753
	Engaging in problem solving		.767
INFORMATION		**0.772**	

STRATEGY			
	information quality		.679
	information sharing		.723
INFORMATION QUALITY		**.911**	**.679**
	information exchange is timely		.794
	accurate		.817
	complete		.834
	adequate		.776
	reliable		.651
INFORMATION SHARING		**.882**	**.723**
	informing partners of changing needs		.649
	share proprietary information		.736
	share business knowledge		.649
	exchange information for business planning		.579
	keeping each other informed		.552
SUPPLY CHAIN LOGISTICS		**.729**	
	Inter organization activities are closely coordinated		.568
	Information and material flow smoothly		.574
	Inbound and outbound distributions are integrated		.527
PERFORMANCE MEASUREMENT		**.849**	
	Financial performance		.897
	Operational performance		.523
FINANCIAL PERFORMANCE		**.760**	**.897**
	Growth in sales		0.537
	Growth on assets		0.494
	Market share gain		0.503
	Return on investment		0.649

	Profit margin on sales		0.477
OPERATIONAL PERFORMANCE		**.848**	**.523**
	Volume Flexibility		.681
	Scheduling Flexibility		.855
	Delivery reliability.		.752
	Product quality		.667
	Customer satisfaction index		.841

Table 5-2 Summary of the statistical descriptive analysis values

CONSTRUCT	VARIABLE	MEAN
MANUFACTURING STRATEGY		4.5
	Quality	4.57
	Cost	4.47
	Delivery	4.52
QUALIY		4.57
	quality approach	4.43
	Implementation of TQM	4.06
	Continuous improvement	4.20
	Benchmark	3.95
	Quality awareness	4.49
		4.47
COST	Sourcing cost	4.28
	Manufacturing cost	4.70
	Sales cost	4.05
	Returns and after sales cost	3.85
DELIVERY		4.52
	Delivery Products needed	4.45
	Delivery on time	4.54
	dependable delivery	4.00
	shipment Tracking	3.95
	Short order-to delivery time	3.81
SUPPLIER PARTNERSHIP STRATEGIES		3.85
	Suppliers selection	4.77
	Suppliers involvement	3.11
	Suppliers base reduction	2.78
SUPPLIERS SELECTION		4.77

	Trust	4.35
	Quality	4.60
	Delivery	4.31
	Price	4.53
	Technical competence	4.40
SUPPLIERS INVOLVEMENT		3.11
	Product Design	3.59
	Continous Improvement	3.86
SUPPLIERS BASE REDUCTION		2.78
	rely on a small number of suppliers	2.65
	get multiple quotations	2.50
	drop suppliers for price reasons	2.21
	drop suppliers for quality reasons	2.33
CUSTOMER RELATIONSHIP STRATEGY		4.56
	Customer Relation Dimension	4.44
	Customer Supplier Relationships	4.46
CUSTOMER RELATION DIMENSION		4.44
	Setting business ethic jointly	4.15
	Measuring Customer Satisfaction	4.17
	Determine future customer expectation	4.14
	Having joint venture improvement program	3.93
CUSTOMER SUPPLIER RELATIONSHIPS		4.46
	Conveying accurate information	4.10
	Developing and maintaining a positive……	4.25
	Using compatible technologies	3.65
	Opening lines of communication….	4.67
	Engaging in problem solving	3.43
INFORMATION STRATEGY		3.81
	information quality	3.52
	information sharing	3.05

INFORMATION QUALITY		3.52
	information exchange is timely	3.19
	accurate	3.28
	complete	3.08
	adequate	3.23
	reliable	3.15
INFORMATION SHARING		3.05
	informing partners of changing needs	2.94
	share proprietary information	3.10
	share business knowledge	3.23
	exchange information for business planning	2.81
	keeping each other informed	2.79
SUPPLY CHAIN LOGISTICS		3.81
	Inter organization activities are closely coordinated	3.52
	Information and material flow smoothly	3.05
	Inbound and outbound distributions are integrated	3.21
PERFORMANCE MEASUREMENT		4.57
	Financial performance	4.73
	Operational performance	4.14
FINANCIAL PERFORMANCE		4.73
	Growth in sales	4.56
	Growth on assets	4.69
	Market share gain	4.39
	Return on investment	4.33
	Profit margin on sales	4.52
OPERATIONAL PERFORMANCE		4.14
	Volume Flexibility	3.19
	Scheduling Flexibility	3.07
	Delivery reliability.	4.55
	Product quality	4.67
	Customer satisfaction index	4.79

5-2 Sample Characteristics

A total of 320 small and medium size manufacturing organizations were survey. A total of 132 usable surveys were completed giving a response rate 41%. The response rate is considered to be great acceptable that because the efforts made during the distribution, follow up and collection strategy adopted.

5-3 Responded Firms

The current numbers of employees working in these sampled firms ranged from 0 to 500 employees, who are in the range of small and medium enterprises (SMEs), see Table 5-3. Of 132 organizations, five (5) companies employed between 0- 20 employees 3.8%, Forty one (41) organizations employed between 21- 100 (31.1%), Thirty five (35) employed between 101- 200 employees (26.5%), and fifty one (51) organizations employee between 201- 500 employees (38.6%).

The analysis shows that most of the organizations investigated were having higher number of employee rate. This indicates that the medium size companies give more opportunity for employment creation.

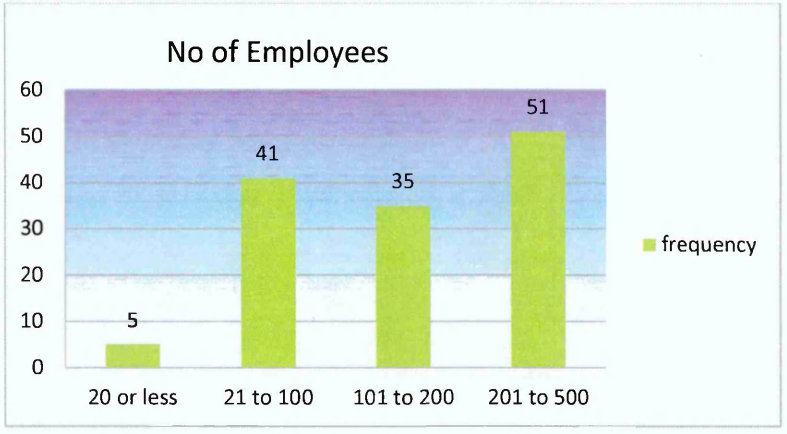

Fig: 5-1 Number of Employees

The graphical presentation of this breakdown is shown in Figure 5-.1. Of the 132 manufacturing firms, 51 were medium-sized which represent 38.6% of the total surveyed organizations. The remaining organizations represent the small sized firms. They count for 81 companies which count for 61.4%.

Table 5-3 shows the detail statistics of the number of employees of different firm size and its percentage.

Table: 5-3 Number of employees

Number of employees					
		FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
NO. OF EMPLOYEE	20 or less	5	3.8	3.8	3.8
	21 to 100	41	31.1	31.1	34.9
	101 to 200	35	26.5	26.5	61.4
	201 to 500	51	38.6	38.6	100.0
	Total	132	100.0	100.0	

When asked to identify their position in the supply chain, respondents selected one of different manufacturing categories provided in the questionnaire. As shown in Table 5-4 and Table 5-5 and presented in Figure 5-2, raw material supplier, component supplier, assembler, and finished product are the options made available in this study.

The table shows the breakdown of the manufacturing categories. Finished product was in the top of the list, followed by assembler. Raw material and component supplier are having equal selection and they came at the bottom of the list.

Table 5-4 Position of company in the supply chain

Position of company in the supply chain					
		FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
POSITION OF COMPANY	Raw material supplier	10	6.8	6.9	6.9
	Component supplier	10	7.6	7.6	14.5
	Assembler	14	10.6	10.7	25.2
	Finished product	98	74.2	74.8	100.0
TOTAL		132	100.0		

The primary type of industry is ranged from food beverage, rubber products, electrical machinery, construction materials, clothing textiles, metal products, furniture, paper, plastics, building materials, chemicals, petroleum and petro-chemicals.

Figure 5-2 shows the primary type of industry and their frequency. Metal industry came on the top of the list which counts for 31 different companies. Rubber products found to be on the bottom of the list and count for one industry which counts for 1%. Other industries vary from 2 to 12 different industries.

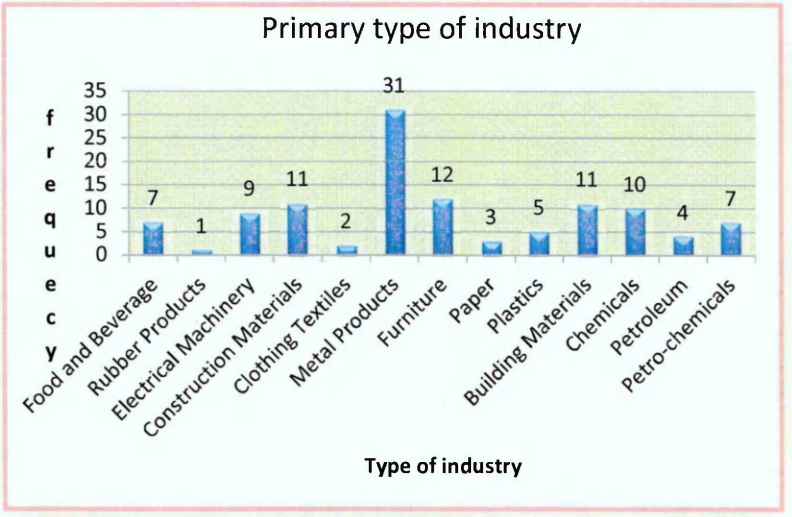

Fig: 5- 2 The frequency of the primary type of industry

Table 5-5 Primary type of industry

		FREQUENCY	PERCENT	CUMULATIVE PERCENT
PRIMARY TYPE OF INDUSTRY	Food and Beverage	7	5.3	5.3
	Rubber Products	1	.8	6.1
	Electrical Machinery	9	6.8	12.9
	Construction Materials	11	8.3	21.2
	Clothing Textiles	2	1.5	22.7
	Metal Products	31	23.5	46.2
	Furniture	12	9.1	55.3

	Paper	3	2.3	57.6
	Plastics	5	3.8	61.4
	Building Materials	11	8.3	69.7
	Chemicals	10	7.6	77.3
	Petroleum	4	3.0	80.3
	Petro-chemicals	7	5.3	85.6
	Others	19	14.4	100.0
	Total	132	100.0	

5-4 Supply Chain Dimensions

In the following section the detail field work data analysis is presented.

5-4-1 Manufacturing Strategy

How important are the following manufacturing strategies in your organization?

I- Reliability Assessment

The manufacturing strategy construct was presented by three dimensions (3) and fourteen items (14). These dimensions including Quality dimensions (5 items), Cost (4 items), and Delivery (5 items). The reliability assessment of the manufacturing strategy construct was tested by means of Crombach's Alpha and Corrected Item-to Total Correlations (CITC) as shown in Table 5-6. The Cronbach Alpha of the manufacturing strategy was found to be (0.843) which is above the acceptable cutoff value (0.70) (Hair et al. 2000) and thus is considered to be accepted. The Corrected Item-to-Total correlations for each item of the main dimensions are shown in the table 6-6. The Corrected Item-to-Total Correlations of Quality dimensions is (0.679), Cost is (0.698), and Delivery is (0.746). All these values are above the cutoff value (0.4) (Nunnally 1994) and thus most of the correlations of these dimensions are found to be significant.

Table 5-6 Cronbach Alpha coefficient and CITC of Manufacturing Strategy

Cronbach Alpha coefficient and Corrected Item-To-Total Correlation of Manufacturing Strategy			
CONSTRUCT	**ITEM**	**CORRECTED ITEM-TOTAL CORRELATION**	**CRONBACH ALPHA α**
Manufacturing Strategy	Quality Dimensions	.679	0.843
	Cost	.698	
	Delivery	.746	

II- Descriptive Statistics

When the respondents asked for the importance of the manufacturing strategies, their answers were shown in Figure 5-3. The answers were ranged from one (Very unimportant) to five (Very important). This mean that there are few organizations did not consider this component of manufacturing strategy crucial for the success of their organization. But the mean value shows the acceptance of these dimensions as success factor for better strategy. Figure 6-3 below illustrates the importance mean in Saudi Arabia manufacturing SMEs. These are prioritized as follows; quality (4.57), cost (4.47), and delivery (4.52). The combined index of importance of the MS is (4.51). This indicates that MS within Saudi Arabia's SMEs is considered to be one of the main blocks of business strategy. The top priority of this strategy was quality dimensions.

From depictive statistics, one can conclude that Saudi Arabia SMEs realized the importance of manufacturing strategy components, from the fact that all of them are above (4) which come between Agree and Strongly Agree. It is not surprising for quality dimension to come on the top of the list. Quality is recognized to be the proven way for a business to survive in the current competitive global market. The report on a survey by Lascelles and Dale (1990), carried out on seventy four U.K. executives concluded that more than 85% of leading CEOs in Europe considered the management of product quality to be one of the top priorities for their organization. Quality is, therefore, as important as cost and delivery strategies, as a business strategy to win in an aggressive market situation against a number of global competitors. This finding comes in line with similar research finding and literatures.

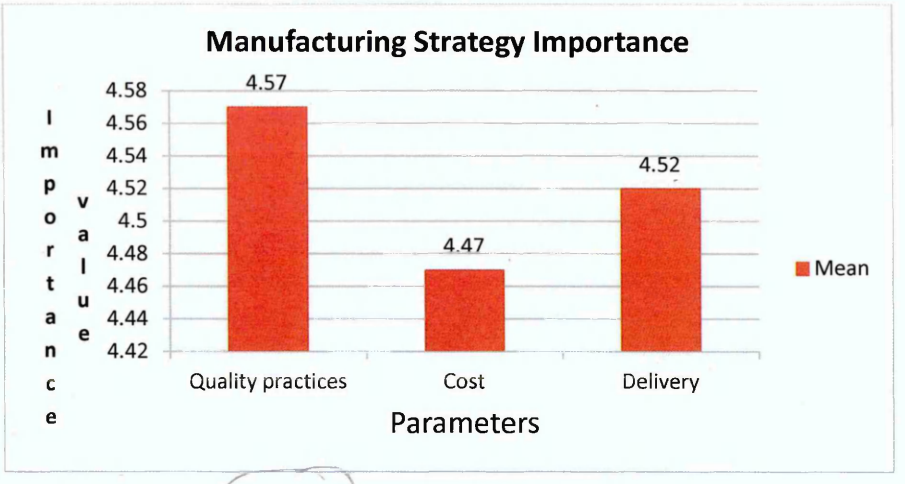

Fig: 5-3 Manufacturing Strategy Importance

5-4-1-1 Quality

How important are each of the following quality Dimensions to your firm?

I- Reliability assessment

The quality construct was presented by five dimensions (5); quality approach, implementation of TQM, continuous improvement, benchmarking, and quality awareness. The reliability assessment of the quality dimensions of Crombach's alpha and Item- To Total Correlations are shown in Table 5-7. The Crombach's Alpha of the quality Dimension was (0.790) which means that this construct is reliable.

The Corrected Item-To-Total Correlations for each item of the quality approach was (0.659), implementation of TQM (0.594), continuous improvement (0.559), benchmarking (0.491), and quality awareness (0.544). These values are above the cutoff value (0.4) and thus most of the correlations are found to be significant and measuring the quality Dimensions.

Table 5-7 Quality Dimension; Assessment Analysis

Quality Dimension; Assessment Analysis			
CONSTRUCT	ITEM	CORRECTED ITEM-TO-TOTAL CORRELATION	CRONBACH ALPHA α
Quality Dimension	Quality approach	.659	.79
	Implementation of TQM	.594	
	Continuous improvement tools	.559	
	Benchmark	.491	
	Quality awareness	.544	

II- Descriptive Statistics

When the respondents asked for the importance of the quality dimensions, their answers were shown in Figure 5-4. The answers were ranged from one (Very unimportant) to five (Very important) for some of the dimensions and ranged from two (unimportant) to five (very important). The mean value shows the acceptance of these parameters as success factor for better quality dimensions.

Figure 5-4 below illustrates the importance mean of the quality dimensions in Saudi Arabia manufacturing SMEs. These are prioritized as follows; quality awareness (4.49), quality approach (4.43), continuous improvement tools (4.20), implementation of TQM (4.06), and benchmark (3.95). The combined index of importance of the MS is (4.22). This indicates that quality dimension within Saudi Arabia's SMEs is considered slightly moderate to MS. The main quality dimension is quality awareness.

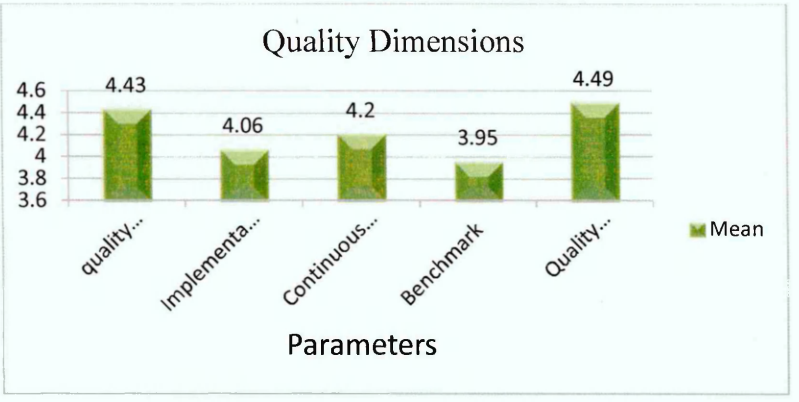

Fig: 5-4 Quality Dimension Importance

5-4-1-2 Total Supply Chain Cost

Please tick the number that accurately reflects your organization present Dimension in lowering total supply chain cost.

I- Reliability Assessment

Table 5-8 shows the Cronbach's Alpha value for each scale and Corrected Item- To Total Correlations (CITC) of the dimensions.

The total supply chain cost was presented by four dimensions (4); sourcing cost, manufacturing cost, sales cost, and returns and after sales cost. The Crombach's Alpha of the total supply chain cost was (.66) which is slightly less than the cutoff value (.70).

The Crombach's Alpha if item deleted was calculated for each sub scale; sourcing cost is (0.582), manufacturing cost (0.531), sales cost (0.559), and returns and after sales cost (0.673). All these values will not improve the overall value of Cronbach alpha of the total supply chain even if any of these sub scale was deleted. Moreover, the Cronbach Alpha (.60) is found accepted in some management research literature. For such reason the Cronbach Alpha of total supply chain is considered reliable.

Table 5-8 Cronbach's Alpha coefficient and CITC of Total Supply Chain Cost

Cronbach's Alpha coefficient and CITC of Total Supply Chain Cost			
CONSTRUCT	**ITEMS**	**CORRECTED ITEM-TO TOTAL CORRELATION**	**CRONBACH'S ALPHA (α)**
Total Supply Cost	Sourcing cost	.444	.66
	Manufacturing cost	.525	
	Sales cost	.474	
	Returns and after sales cost	.321	

The Corrected Item-To-Total Correlations (CITC) for each item of the sourcing cost is (0.444), manufacturing cost (0.525), sales cost (0.474), and returns and after sales cost (0.321) All these values are above the cutoff value (0.4) except for return and after sales which is less than 0.4 and thus most of the correlations are found to be significant and measuring the quality Dimensions.

II- Descriptive Statistics

Figure 5-5 shows the mean values of sourcing cost, manufacturing cost, sales cost, and returns and after sales cost presented in are (4.28), (4.70), (4.05), and (3.85) respectively. The table shows the highest mean value is 4.70 that for manufacturing cost and the lowest is 3.85 that is for returns and after sales cost .

The illustration of the mean values is show in Fig 5-5.

From the illustration show in Figure 5-5, one can notice that the total supply cost came in the top of the list and sourcing cost follows. Returns and after sales cost came on the bottom of the list. The return and after sales cost were not given a considerable attention in their strategy. This sub- scale plays an important role not only in the respect of cost of the quality but the company image and reputation might be severely affected.

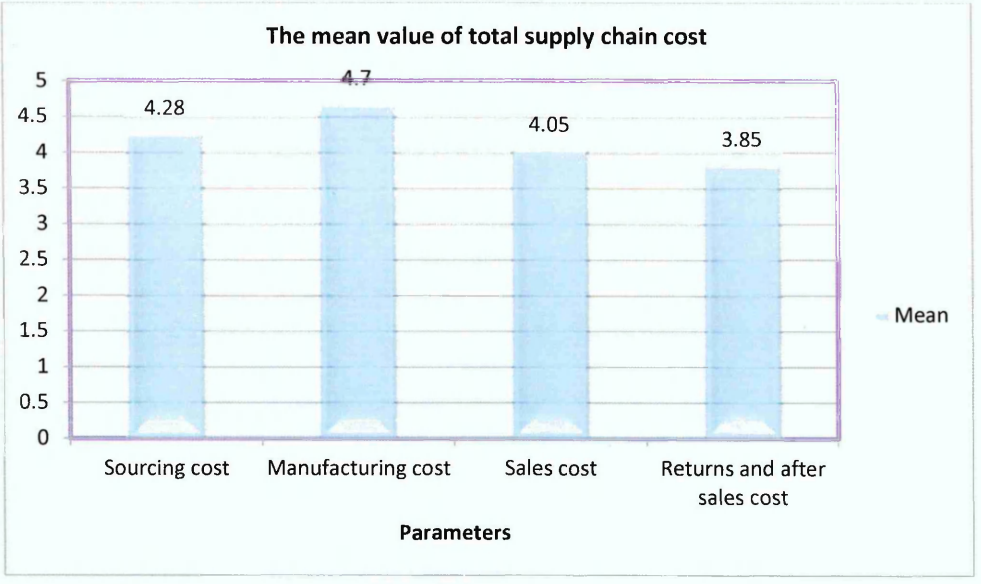

Fig: 5-5 The mean values of Total Supply chain Cost

5-4-1-3 Delivery

How important are the following delivery Dimensions to your organization?

I- Reliability Assessment

The reliability assessment of delivery dimensions by means of Crombach's Alpha and Corrected Item-To Total Correlations were calculated and are shown in Table 5-9. The Crombach's Alpha of the main construct was found (0.783). This is well accepted alpha value.

Table 5-9 Cronbach's Alpha coefficient and CITC of Delivery

Cronbach's Alpha coefficient and CITC of Delivery			
CONSTRUCT	CRONBACH'S ALPHA α	ITEMS	CORRECTED ITEM-TOTAL CORRELATION
Delivery	0.783	Delivery the kind of products needed	.595
		Delivery customer order on time	.546
		Provide dependable delivery	.529
		Implement shipment tracking	.542
		Short order-to delivery time	.618

The Corrected Item-To-Total Correlations for each item of delivery the kind of products needed, delivery customer order on time, provide dependable delivery, implement shipment tracking, and short order-to delivery time are (0.5950, (0.546), (0.529), (0.542), (0.618) respectively. All these values are above the cutoff value (0.4) and thus the correlations are found to be significant and measuring the delivery dimensions.

II- Descriptive Statistics

When the respondents asked for the importance of delivery dimensions, their answers were represented in Figure 5-6. The Figure 5-6 illustrates the importance mean of delivery strategy in Saudi Arabia manufacturing SMEs. These are prioritized as follows; delivery customer order on time, delivery the kind of products needed, provide dependable delivery, implement shipment tracking, and short order-to delivery time (4.54), (4.45), (4.00), (3.95), and (3.81) respectively. The main delivery dimension was delivery customer order on time.

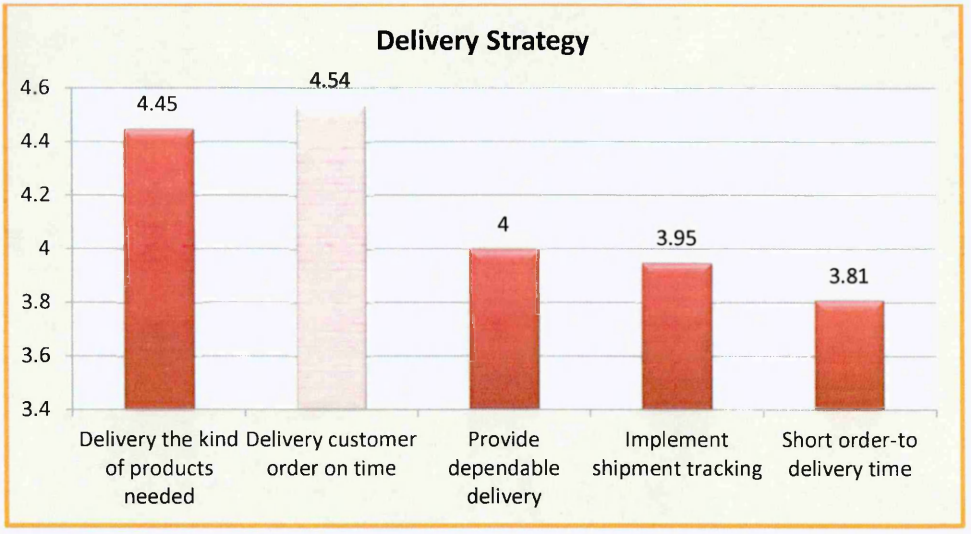

Fig: 5-6 Deliver Strategy

5-4-2 Supplier Partnership Strategy

How important are the following supplier partnership strategies to your organization?

I- Reliability Assessment

The Cronbach's Alpha and Corrected – Item To Total Correlation were calculated first for the three main dimensions. Table 5-10 below shows the calculation results. The reliability of supplier relationship strategy was (α=0.675). Thus, the construct is internally consistent and reliable. This value shows the consistency and reliability of the construct.

Table 5-10 Crombach's Alpha coefficient and CITC Correlation of Supplier Relationship Strategy

Crombach's Alpha coefficient and Corrected Item-To-Total Correlation of Supplier Relationship Strategy			
CONSTRUCT	ITEM	CORRECTED ITEM-TOTAL CORRELATION	**CRONBACH ALPHA α**
Supplier relationship strategy	Supplier selection	.440	0.675
	Supplier involvement	.434	
	Supply base reduction	.482	

The Corrected Item To Total Correlation values are summarized in the above table. It was found that, supplier selection has a value of (0.440), supplier involvement has a value of (0.434), and supplier base reduction has a value of (0.482). The result evidenced that the item scale correlations exceeded (0.40) and therefore, indicated good item internal consistency for the core questionnaire and measuring the relevant construct precisely.

II- Descriptive Statistics

The descriptive statistics analysis of supplier partnership is illustrated in Figure 5-7. As shown in Figure 5-7, the highest ranked item in supplier partnership strategy was supplier selection with mean value of μ=4.77. This result suggested that supplier partnership strategy is primarily influenced by the supplier selection. This result is consistent with the past studies of traditional organizations. The world class organizations give equal consideration to supplier involvement and using few base suppliers.

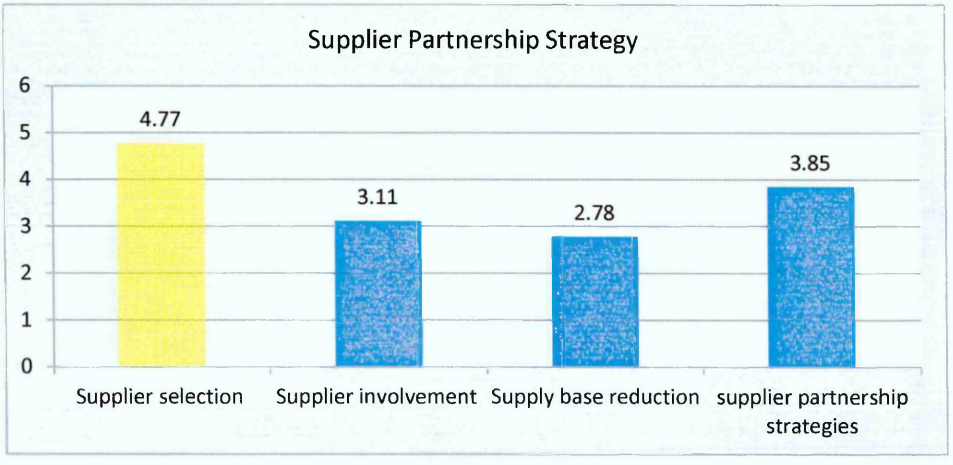

Fig: 5-7 Supplier Partnership Strategy

5-4-2-1 Supplier Involvement Strategy

How important are the following supplier Involvement techniques to your organization?

I- Reliability Assessment

The internal reliability of the supplier involvement strategy construct was assessed using the standardized Cronbach's Alpha coefficient. The Alpha coefficient was (α=0.846) which consider reliable.

Supplier Involvement strategy was examined with two different dimensions as follows: Product Design and Continue Improvement. Table 5-11 below shows the reliability and Corrected Item -To- Total Correlation of supplier involvement

strategy.

The Corrected – To- Total Item Correlation values are summarized in Table 5-16 above. It was found that, the Product Design has a value of (0.645) and the Continous Improvement has a value of (0.755). The result evidenced that the item scale correlations exceeded (0.40) and therefore, indicated good item internal consistency for the core questionnaire and measuring the relevant construct precisely.

Table 5-11 Crombach's Alpha coefficient and CITC of Supplier Involvement Dimension

Crombach's Alpha coefficient and CITC of Supplier Involvement Dimension			
THE CONSTRUCT	CRONBACH'S ALPHA α	ITEMS	CORRECTED- ITEM-TO TOTAL CORRELATION
supplier Involvement	.846	Product Design	.645
		Continous Improvement	.755

II- Descriptive Statistics

In this part of the survey, the respondents were questioned on the extent of their involvement of their suppliers in the product design and continuous improvement programs. The first issue dealt with the supplier involvement in the design process and the second issue is the supplier involvement in the continuous program.

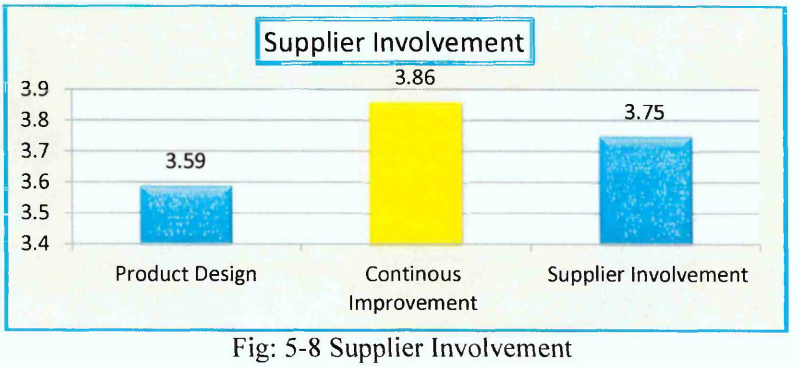

Fig: 5-8 Supplier Involvement

Figure 5-8 shows the mean value of the respondents' results regarding Supplier Involvement. It suggests that the respondents perceived "Continues Improvement" to be more important than involving their supplier in the design program with mean value of μ=3.86. This could be because most of the companies investigated either produced pre designed product or a product that does not. Yet, introducing the same product with different design attracts more market. The result suggested there is an opportunity to engage suppliers in improvement projects and in product design, for the benefits of both parties.

As conclusion, organizations that ignore the potentials of supplier involvement into process improvement might lose competitive advantage in their markets.

5-4-2-2 Supplier Base Reduction Strategy

Please tick (√) the number that accurately reflects your organization present Dimension in depending on small number of suppliers.

I- Reliability Assessment

Cronbach's Alpha coefficient with value more than (0.7), was used to assess the reliability of the four (4) dimensions. The Cronbach's Alpha coefficient values of this construct falls within the acceptable range (.711) to conclude good reliability.

Supplier base reduction strategy was constructed with four (4) different items as follows:

1. Rely on a small number of suppliers,
2. Receiving multiple quotes from suppliers before ordering
3. Rejecting suppliers for price reasons
4. Refusing suppliers for quality reasons

Table 5-12 below shows the reliability of supplier selection strategy and Corrected-To- Item Correlation. The coefficient alpha of the main construct was (α=0.711). The reliability coefficients is slightly more than the benchmark limit (0.70).Thus, the construct is internally consistent and reliable.

The Corrected Item – To - Total Correlation values are summarized in the above table. It was found that, Rely on a small number of suppliers has a value of (0.556), Receiving multiple quotes from suppliers before ordering has a value of (0.548), Rejecting suppliers for price reasons has a value of (0.645), and Refusing suppliers for quality reasons has a value of (0.621). The result evidenced that the item scale correlations exceeded (0.40) and therefore, indicated good item internal consistency for the core questionnaire and measuring the relevant construct precisely.

Table 5-12 Cronbach Alpha coefficient and CITC of supplier selection strategy

Cronbach Alpha coefficient and Corrected Item-to-Total Correlation of supplier selection strategy			
THE CONSTRUCT	CRONBACH'S ALPHA α	ITEMS	CORRECTED-ITEM-TO TOTAL CORRELATION
Supplier Base Reduction	.711	Rely on a small number of suppliers	.556
		Receiving multiple quotes from suppliers before ordering	.548
		Rejecting suppliers for price reasons	.645
		Refusing suppliers for quality reasons	.621

II- Descriptive Statistics

The survey questionnaire asked respondents to score the degree of agreement of the firm's supplier selection strategy on a scale of 1 (strongly disagree) to 5 (strongly agree). The dimensions of this construct include; relying on a small number of suppliers, receiving different quotes, rejecting suppliers for price reasons, and refusing suppliers for quality.

Fig: 5-9 Supplier Base Reduction

The illustration shown above in Figure 5-9 suggested that the respondents did not perceive supplier base reduction as important part to their supplier partnership strategy. This result is in contradiction with the supply chain best dimension.

The study shows that few SMEs consider supply base reduction as a strategy to manage their suppliers. Best supply chain companies are reducing the number of primary suppliers and allocating a majority of the purchased material to a single source (Kekre et al., 1995).

5-4-3 Customer Relationship Dimension

How Important are the following Customer Relationship Strategy to your organization?

I- Reliability assessment

The survey investigated the main two components of customer relationship Dimension; Customer Relationship Dimension, and Customer Supplier Relationships. In order to have deep study, again both the components were divided into different dimensions. The research studied the Customer Relation Dimension construct by looking at four (4) different sub scales. While Customer Supplier Relationships studied by looking at five (5) different dimensions.

Table 5-13 shows the Cronbach's alpha values of the main two components of customer relationship Dimension. The table shows the Corrected Item-to Total

Correlations values too. The Cronbach's Alpha coefficient of the general index (customer relationship Dimension) is (0.732) which means that this construct is reliable and can be used to this research. The Corrected Item to Total Correlation of "Customer Relation Dimension" is (0.566) and for "Customer Supplier Relationships" is (0.643). Both values are above the cutoff. Thus, these two components are measuring the customer relationship strategy.

Table 5-13 Cronbach Alpha coefficient and CITC of Customer Relation Dimension

Cronbach Alpha coefficient and Corrected Item-To-Total Correlation of Customer Relation Dimension			
CONSTRUCT	ITEM	CORRECTED ITEM-TO TOTAL CORRELATION	CRONBACH'S ALPHA α
Customer Relationship Strategy	Customer Relation Dimension	.566	0.732
	Customer Supplier Relationships	.643	

II- Descriptive Statistics

The respondents were asked to rank the importance of the customer relationship strategy to their organization. The mean of respondents are 4.44 and 4.46 for Customer Relation dimension and Customer Supplier Relationships respectively. , see Table 5-21.

Figure 5-10 below illustrates the importance mean of Customer Relationship Strategy of SMEs operated in Saudi Arabia. These are prioritized as follows; customer supplier relationships (μ =4.46), follows by customer relation dimension (μ= 4.44). From the table, it can be realized that the both dimensions are considered important. The overall mean value (μ) of the main construct was customer relationship strategy was (μ =4.56).

Fig: 5-10 Customer Relationship Strategy

The result of this analysis evidences the importance of customer to an organization. The customer is the reason for an organization being a live and making profitable business. So, it is important to keep the customer relation healthy and strive to maintain successful relationship between an organization and its customers.

The core theme of all CRM is its focus on "Customer Relation dimension" and "Customer- Supplier Relationship". These are found to be the main strategy toward successful customer relationship strategy. In the current era of hyper-competition locally and at globe level, marketers are forced to be more concerned with customer retention and loyalty (Reichheld, 1996).

As several studies have indicated, retaining customers perhaps offers a more sustainable competitive advantage than acquiring new ones. What marketers are realizing is that it costs less to retain customers than to compete for new ones (Rosenberg &Czepiel, 1984). Similarly, being a supplier for large organization, SMEs pay more attention to develop, maintain and improve their business relation with their customer. Having realized that, SMEs need to build its strategy around this understanding.

5-4-3-1 Customer Relationship Management

How important are the following Customer Relation to your organization?

I- Reliability assessment

The measurement scale for the assessment of Customer Relation dimensions was derived by conducting a reliability analysis using the Cronbach's Alpha coefficient. As a result, the Alpha (α) value was (.652).

Table 5-14 Cronbach's Alpha coefficient and CITC of Customer Relationship Dimension

Cronbach's Alpha coefficient and Corrected Item-To-Total Correlation of Customer Relationship Dimension			
THE CONSTRUCT	CRONBACH'S ALPHA α	SUB SCALE	CORRECTED-ITEM-TO TOTAL CORRELATION
Customer Relation Dimensions	.652	Setting business ethic jointly	.503
		Measuring Customer Satisfaction	.549
		Determine future customer expectation	.487
		Having joint venture improvement program	.443

Corrected Item- To Total Correlation for each item of customer relation Dimension was evaluated and summarized in Table 5-14. Corrected Item- To- Total Correlation of "Setting business ethic jointly" was (.503), "Measuring Customer Satisfaction" was (.549), "Determine future customer expectation" was (.487), and "Having joint venture improvement program" was (.443). It is clear from the analysis that the results were above the cut off value (.4). This provides evidence of good correlation between the component and its core construct.

II- Descriptive Statistics

The purpose of examining the Customer Relation Dimension is to contribute further to our understanding its significance to the supply chain management and how it effects on the firm performance.

Figure 5-11 below illustrates the importance of Customer Relation Dimension in Saudi Arabia manufacturing SMEs. The overall mean of Customer Relation Dimension was 3.59. This moderate level of mean is subject of concern.

The mean values of all parameters are more than (3) Neutral and closed to 4(agreed). It can be seen that the customer relation dimension is moderate in importance (on a scale of 1–5), represented by setting business ethic jointly" was (μ=4.15), "Measuring Customer Satisfaction" was (μ=4.17), "Determine future customer expectation" was (μ=4.14), and "Having joint venture improvement program" was (μ=3.93). The mean of overall index was (μ=3.59).

The figure above shows that customer satisfaction is the most important dimension among others because of its inherent barrier to competition.

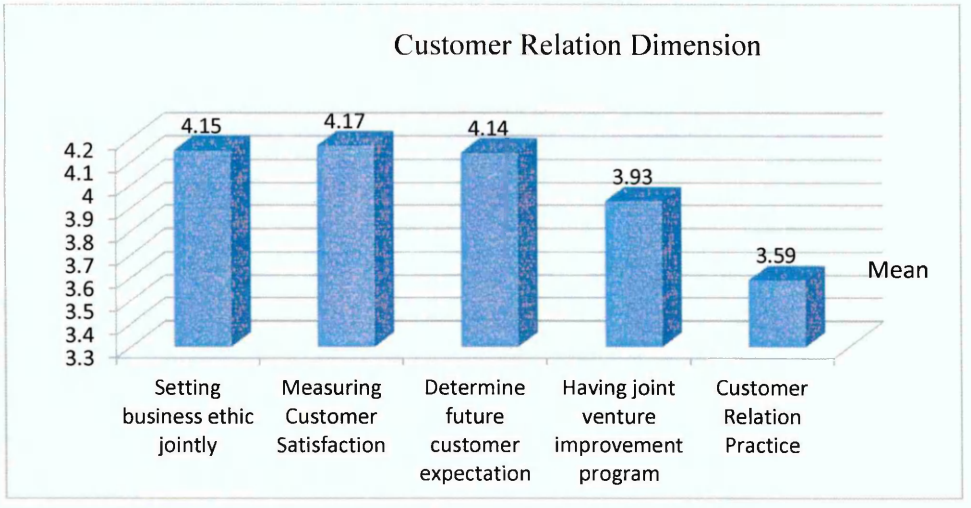

Fig: 5-11 The Importance of Customer Relation Dimension

Small- and medium-sized enterprises generally have limited sources and channels for reaching customers; consequently they are concerned about keeping customers. Satisfying customers' needs is the central purpose of any business. Dibb et al. (1994)

describe customer satisfaction as the major aim of marketing. Organizations can outperform their competition by exceeding, not just satisfying, and the needs of their customers. SMEs by maintaining this strategy will not only maintain their customers' base but will add more customer names to their profile.

5-4-3-2 Customer supplier relationships

How important are the following **Customer Supplier Relationships** ***Dimensions to your organization?***

I- Reliability Assessment

The reliability assessment of Customer Supplier Relationships dimensions by means of Crombach's alpha and Corrected Item-to Total Correlations were calculated and are shown in Table 5-15. The Crombach's Alpha of the main construct was found (0.780). This is well accepted alpha value.

Table 5-15 Cronbach's Alpha coefficient and CITC of Customer Supplier Relationships

Cronbach's Alpha coefficient and CITC Customer Supplier Relationships			
CONSTRUCT	CRONBACH'S ALPHA α	ITEMS	CORRECTED ITEM-TO TOTAL CORRELATION
Customer supplier relationships	0.780	Conveying accurate information	.582
		Developing and maintaining a positive relationship	.566
		Using compatible technologies	.565
		Opening lines of communication	.553
		Engaging in problem solving	.625

The Corrected Item-To-Total Correlations for each item of Customer supplier relationships; conveying accurate information , developing and maintaining a positive relationship, using compatible technologies, opening lines of communication and engaging in problem solving are (0.582), (0.566), (0.565), (0.553), and (0.625) respectively. All these values are above the cutoff value (0.4) and thus the correlations are found to be significant and measuring the customer supplier relationships dimensions.

II- Descriptive Statistics

When the respondents asked for the importance of customer supplier relationships dimensions, their answers were illustrated in Figure 5-12. The Figure below illustrates the importance mean of customer supplier relationships dimensions in Saudi Arabia manufacturing SMEs. These are prioritized as follows; Opening lines of communication, Developing and maintaining a positive relationship, Conveying accurate information, Using compatible technologies, and Engaging in problem solving (4.64), (4.25), (4.10), (3.65), and (3.43) respectively. The main customer supplier relationships dimension was Opening lines of communication.

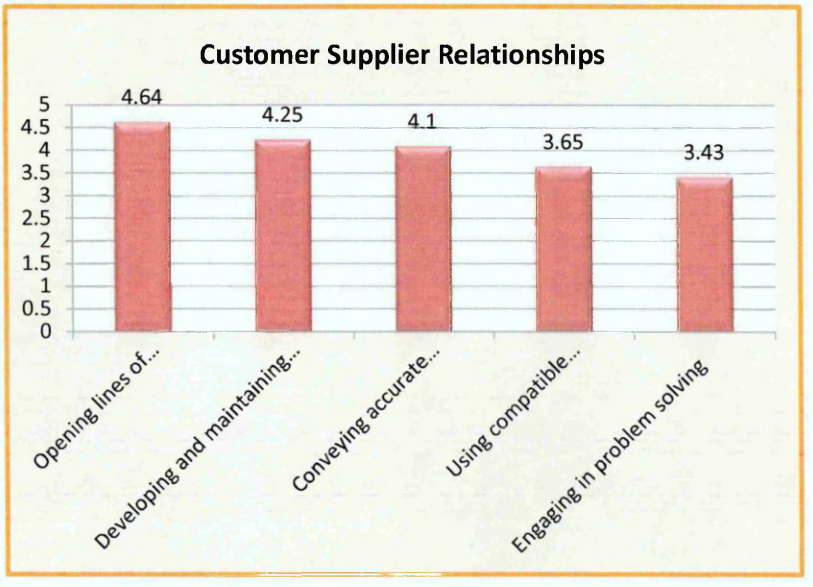

Fig: 5-12 Customer Supplier Relationships

5-4-4 Information Strategy in Supply Chain

How important are the following information strategies to your organization?

I- Reliability Assessment

Table 5-16 shows the Cronbach's Alpha value for each scale and Corrected Item-To Total Correlations.

The survey divided the information strategy dimension into two constructs (2); information quality and information sharing. The formal one was presented by five

dimensions (5) and the information sharing was presented by five dimensions (5) too.

Table 5-16 summarizes the results of the internal consistency reliability analysis for the information strategy dimension. The construct achieved alpha of (0.772) that exceeded the accepted minimum coefficient of (0.70) which is required for analysis. Thus, the construct is internally consistent and reliable.

Corrected Item- to Total Correlation (CITC) was calculated, as summarized in Table 5-16 for the core questionnaire, information strategy dimension. It was found that, (CITC) information quality is (0.679) and information sharing is (0.723). The result evidenced that the item scale correlations exceeded (0.40) and therefore indicated good item internal consistency for the core questionnaire and measuring the same construct precisely

Table 5-16 Cronbach Alpha coefficient and CITC of information strategy

Table Cronbach Alpha coefficient and Corrected Item-To-Total Correlation of information strategy			
CONSTRUCT	ITEM	CORRECTED ITEM-TO TOTAL CORRELATION	CRONBACH'S ALPHAα
information strategy	Information Quality	.679	0.772
	Information Sharing	.723	

II- Descriptive Statistics

The respondents were asked to rank the importance of the information strategy. The measurements were ranged from one (very unimportant) to five (Very important). Their answers were illustrated in Figure 5-13. The mean value shows the low acceptance of these parameters as success factor for better strategy (3.05 – 3.81).

The illustration shows the importance mean of information strategy in Saudi Arabia manufacturing SMEs. These are prioritized as follows; information quality (3.52), information sharing (3.05). The main information strategy was information quality Dimensions. The overall mean value (μ) of the main construct was (3.81).

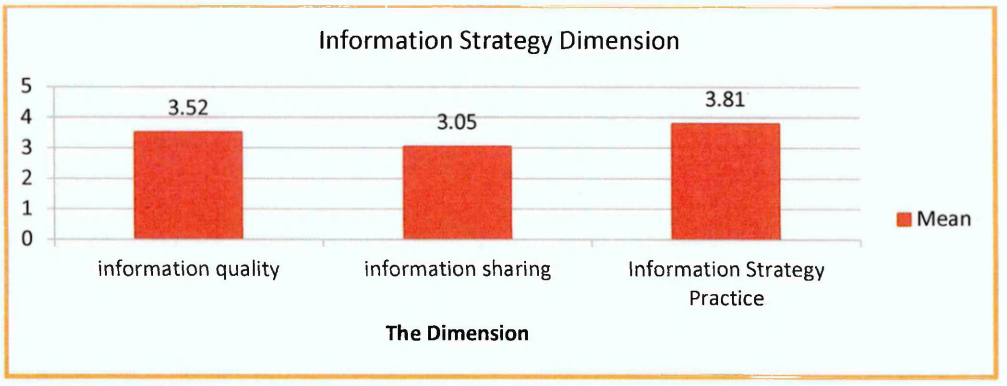

Fig: 5-13 Information Strategy Dimension

5-4-4-1 Information Quality

How important are the following information quality to your organization?

I- Reliability Assessment

The assessment of information quality was derived by conducting a reliability analysis using the Cronbach's alpha coefficient. As a result, the alpha (α) value of information quality construct was (.991).

Table 5-17 Cronbach's Alpha coefficient and CITC of Information Quality Dimension

Cronbach's Alpha coefficient and CITC of Information Quality Dimension			
THE CONSTRUCT	CRONBACH'S ALPHA α	SUB SCALE	CORRECTED-ITEM-TOTAL CORRELATION
Information Quality	.911	information exchange is timely	.794
		information exchange is accurate	.817
		information exchange is complete	.834
		information exchange is adequate	.776
		information exchange is reliable	.651

Corrected Item –to Total Correlation for each item of information quality was evaluated and summarized in Table 6-17. Corrected Item –to Total Correlation of "timely information was (.794)", "accurate information was (.817)", "complete information was (.834)", "adequate information was (.776)", "reliable information was (.651)". It is clear from the analysis that the results were above the cut off value

(.4). This provides evidence of good correlation between the component and its core construct.

II- Descriptive Statistics

The purpose of examining the information quality is to contribute further to our understanding of the significance of quality of shared information and how it effects on the firm performance.

Figure 5-14 below illustrates the importance mean of information sharing in Saudi Arabia manufacturing SMEs. Information quality dimension is represented by timely information exchange (3.19), the accuracy of information exchange is (3.28), completeness of information exchange is (3.08), adequacy of information exchange (3.23), and reliability of information reliability is (3.15).The most important parameter was the accuracy of information exchanged. The overall mean of information was (3.22). This low level of mean for most of the item is subject of concern.

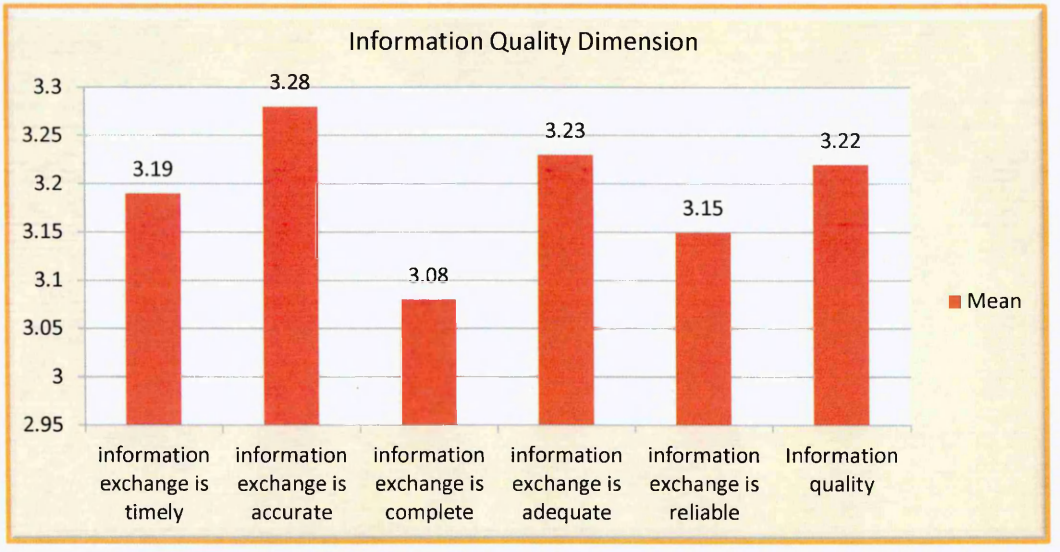

Fig: 5-14 Information Quality Dimension

Previous studies have demonstrated that sharing information significantly improves operational supply chain performance (e.g., Hill & Scudder, 2002). While information sharing is important, the significance of its impact on supply chain performance depends largely on the quality of the shared information where quality refers to the shared information's usefulness, accuracy, and accessibility (Li, Ragu-

Nathan, Ragu-Nathan, &Rao, 2006). Sharing low quality information that is void of these attributes may not benefit supply chain participants (Huang, Lau, &Mak, 2003).

5-4-4-2 Information Sharing

How important are the following information sharing Dimension to your organization?

I- Reliability Assessment

To test the reliability of the main domain (Information sharing), the internal consistency of the questionnaire was measured using Cronbach's Alpha coefficient (α). The alpha for the main attribute was found to be (0.882), which suggested that the domain is reliable and significant.

Looking at Table 5-18, one can see that the Corrected Item-To Total Correlations seems to be significant and that measuring the main domain. The Corrected Item-to .Total Correlations of "informing partners of changing needs" is (.649), "share proprietary information" is (.736), "sharing business knowledge" is (.649), "exchange information for business planning" is (.579), and "keeping each other informed" is (.552). It can be concluded that the values are significant and the sub scale are correlated to the main domain.

Table 5-18 Cronbach's Alpha coefficient and CITC of Information Sharing Dimension

Cronbach's Alpha coefficient and Corrected Item-To Total Correlations of Information Sharing Dimension			
THE CONSTRUCT	CRONBACH'S ALPHA α	SUB SCALE	CORRECTED- ITEM-TO TOTAL CORRELATION
Information Sharing	.882	informing partners of changing needs	.649
		share proprietary information	.736
		share business knowledge	.649
		exchange information for business planning	.579
		keeping each other informed	.552

It is shown that "share proprietary information" is the highest correlated one, with a value of (.736), followed by "inform trading partners in advance" which in turn followed, "exchange information for business planning" and "keeping each other informed " is the weakest correlated to the main domain with a value of (.552).

II- Descriptive Statistics

Figure 5-15 illustrates the detail results of information sharing dimension. From the graph, one can notice that the mean of "informing partners of changing needs" is (2.94), "share proprietary information" is (3.10), "sharing business knowledge" is (3.23), "exchange information for business planning" is (2.81), and "keeping each other informed" is (2.79). The overall mean of information sharing is (3.75).

Information within supply chain can vary from strategic to tactical in nature. Many researchers have suggested that the key to the seamless supply chain is making clear and up-to-date marketing data available at every node within the supply chain. Sharing available information within supply chain with other parties in the chain plays crucial role in partnership success and thus for SCM performance.

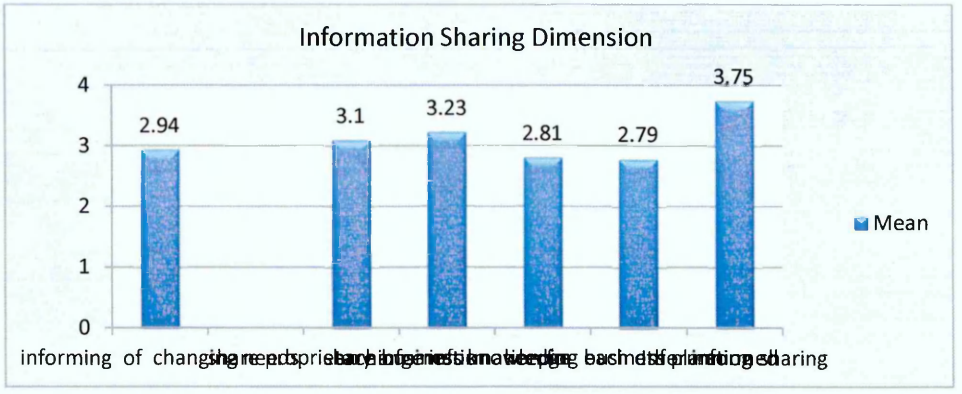

Fig: 5-15 Information Sharing Dimension

The graph above illustrates the importance of information sharing Dimension for the group sample of the study. It can be seen that the decreased importance for information sharing is an area of concern. There should be reasons behind such results. The reasons could be the low level of trust experienced between the partners, supplier uncertainty, and un- availability of supported IT to share the required information, or identification of information to be shared.

5-4-4-3 Usage of Information Technology

Please tick (√) ALL IT application (s) used in your business interactions with your suppliers.

The survey looks into the use of specific information technology applications in business interactions, on "Yes", "No" scale. The results are tabulated in Table 6-20 and illustrated as shown in Figure 5-16. As can be seen from Figure 5-16, most frequently used technologies are "Telephone", " Fax", and E mails as (118), (122), and (131) respectively. This represents (89.3%), (92.4), and (99.2) percent respectively. The frequency of using E mails in business interactions is higher than others. This gives good indications that some sort of new technology is being used by Saudi Arabia SMEs in their business communication and interactions.

The implementation of IT technologies such as EDI and Intranet came just next to Phone, Fax, and E mail with a percentage 43.2% and 56% respectively. This result was not found to be as important as should be while literature emphasized IT technology to be an essential component of SCM for smooth information flow.

The survey evidence showed that the level of application of IT technologies like E-commerce, MRPII, Engineering data, and Manufacturing Execution in implementing SCM strategies is very low. Table 6-20 shows that E-commerce is used by (36) companies; MRPII is used by (14) companies, Engineering data is used by (4) companies, and Manufacturing Execution is used by (5) companies. This figures represent (2.3%), (14%), (3%), and (3.8%) respectively. The reason behind the low level of application might be the investment and the level of skills which most of SMEs suffer off.

Respondents showed moderate usage of Information technologies like Extranet, MRP, ERP, Bar Code, and CAD in their SCM implementation. The statistical Table 5-19 shows that the percentage is between (14% – 27%). The benefits of using ERP and Bar code in business control are well documented in the literature. Integrating information across the enterprise and across the supply chains has long been considered an important strategy to achieve substantial cost efficiencies.

Though enterprise resource planning (ERP) systems were considered costly and risky in the 1990s, its benefits are well recognized in the literature. Some of the benefits ERP systems could bring include operational efficiency and reduced costs, enforcing a discipline of best Dimension processes and consistency.

Typical features of enterprise systems such as data integrity, real-time availability, visibility and processing capability of information and standardized business processes are expected to create an excellent backdrop for embarking on integration with external partners in the supply chain. Enterprise Resource Planning (ERP) system can position the organization for effective management of the supply chain.

Manufacturers' investment in strategic infrastructure, such as Enterprise Resource Planning (ERP) and EDI, can provide the foundation to bring people, processes, and relationships together to build an integrated business system that supports the e-business strategy for critical business initiatives without huge IT investments.

ERP systems have come a long way in providing for lean supply chain management principles that are employed by organization. ERP provides an agile transaction workflow that can be adapted to meet the needs of SMEs businesses.

They improve operational efficiency, save time, reduce errors, cut costs, and benefit from customer or regulatory requirements. For these reasons, the implementation of these technologies was expected to be more as evidenced in best Dimension companies.

These results support the low level of implementation of certain important IT technologies which is a subject of concern in developing supply chain capabilities. The results illustrated in Figure 5-16 indicate that the respondents are not familiar with the functions for the application of information and communication technologies. Investment, skills and company size are most main obstacles for SMEs for not adopting sophisticated or so advanced IT technology.

Table: 5-19 Information Technologies

Information Technologies		
TECHNOLOGIES	RESPONSE	
IT TECHNOLOGY	NO.	PERCENTAGE
Phone	131	99.3%
Fax	122	98.4%
e-mail	118	89.2%
EDI	57	43.2%
Intranet	74	56.1%
Extranet	30	22.7%
MRP	24	18.2%
MRPII	14	3.0%
ERP	29	22.0%
Bar code	90	14.4%
E-commerce	3	2.3%
CAD	36	27.3%
Engineering data.	4	35.6%
Manufacturing execution.	5	25.8%

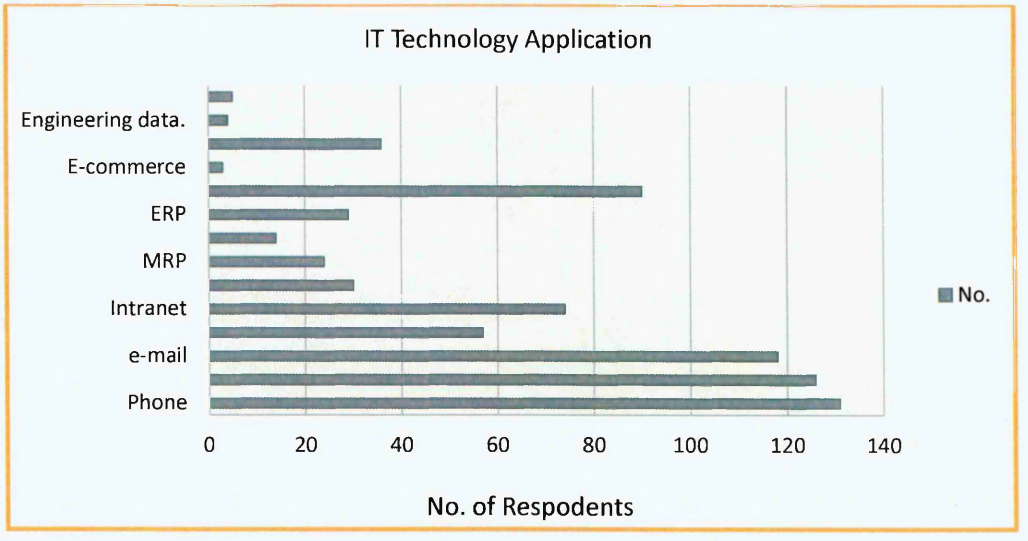

Fig: 5-16 IT Technology Applications

5-4-5 Supply Chain Logistics

Please tick the number that accurately reflects your organization present Dimension

I- Reliability Assessment

The internal consistency measures (Cronbach's Alpha) are obtained in order to assess the reliability of the importance of supply chain logistics strategy for the study sample (Saudi Arabia SMEs manufacturing sector). Table 5-20 shows the Cronbach's Alpha value for each scale and corrected item-to total correlations.

The survey divided the supply chain logistic strategy into three different strategies as followed; 1) The coordination of inter organizational activities, 2) Smooth flow of Information and material, and finally, 3) Integration of inbound and outbound distributions activities.

Table 5-20 summarizes the results of the internal consistency reliability and Corrected Item- To – Relation analysis for the supply chain logistics strategy. The construct achieved alpha of (0.729) that exceeded the accepted minimum □ coefficient of (0.70) which is required for analysis. Thus, the construct is internally consistent and reliable.

Corrected Item- to – Total Correlation analysis of the inter organization activities has a value of (0.568), Smooth flow of Information and material has a value of (0.574), and finally, integration of inbound and outbound distributions activities has a value of (0.527). The result shows that the item scale correlations exceeded (0.40) and therefore, indicated good internal consistency for the core questionnaire and measuring the same construct precisely.

Table 5-20 Cronbach Alpha coefficient and CITC of Supply Chain Logistics Strategy

Cronbach Alpha coefficient and Corrected Item-To-Total Correlation of Supply Chain Logistics Strategy			
CONSTRUCT	**ITEM**	**CORRECTED ITEM-TOTAL CORRELATION**	**CRONBACH'S ALPHA α**
Supply Chain Logistics	Close coordination of inter organizational activities	.568	0.729
	Smooth flow of Information and material	.574	
	Integration of inbound and outbound distributions	.527	

II- Descriptive Statistics

The respondents were asked to rank their agreement with the supply chain logistics strategy. Figure 5-17 below illustrates the findings of supply chain logistics strategy in Saudi Arabia manufacturing SMEs. Those are prioritized as follows; inter organization activities are closely coordinated (μ =3.52), inbound and outbound distributions are integrated (μ=3.21), and information and material flow smoothly (μ=3.05). The overall mean value (μ) of the main construct was (3.81). The responses were at the left side of the ranking scales; especially from strongly disagree to neutral. This means that most of the organizations examined and perceived, has little or no crucial importance for the supply chain logistics, in framing their supply chain strategy management.

The findings suggested that SMEs manufacturing companies operated in Eastern province of Saudi Arabia do not seem to be ready for playing a significant and demanding role in supply chains. Current insufficiencies, including limited abilities in closely coordinating the inter organization activities, in the smoothness flow of information and material, and finally in the integration of inbound and outbound distributions are the basic requirements, Failing to comply with basic requirements of logistic Dimension will jeopardize the supply chain performance of this industry.

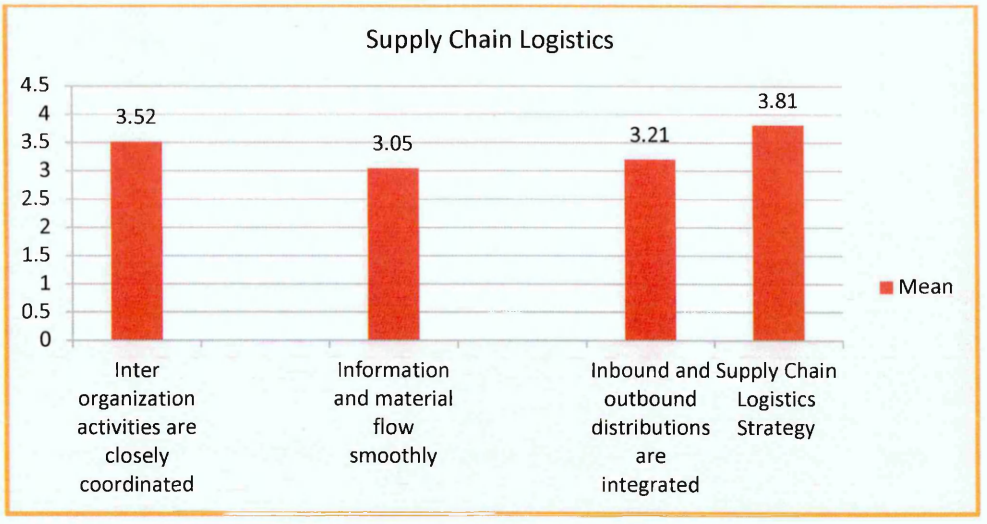

Fig: 5-17 Supply Chain Logistics

To overcome these limitations and weakness the organization should:

1. Ensure transparency among its stake holders.
2. Establish concrete terms and conditions for the long term relationship.
3. Develop proper communication by sharing accurate and information with strong IT back up. Efficient IT support can be provided by increasing investment in technology, and by enhancing technical manpower.
4. Introduce proper planning and implementation of transportation & distribution activities, combined timely flow of information and considerably reduced cost, thereby integrating the inbound and outbound distribution.

5-4-6 Supply Chain Initiatives Data Analysis

Please tick the number that accurately reflects your organization present Dimension

During the 1880s and1990s the software support systems transited from simple packages to more broad and complicated software that to facilitate the linkage of different parties in the chain. Electronic Business, Internet, enterprise resource planning (ERP), and manufacturing resource planning (MRPII) are just examples of this Information Technology development.

The study examined about initiative strategy of the SME manufacturing companies in adopting different IT applications. It includes, implementation of IT, E – Business, Internet, Bar Code, and EDI. The respondents were asked to identify their strategy of adoption against each type of technology.

Figure 5-18 17 illustrates the respondent's reply for supply chain initiatives. It shows the applications of Internet, E Business, and Bar Code are very low. On other side, it is clear that likeliness towards these applications is very low. Some companies are planning to adopt different sort of applications. The companies in the "MAY BE" category is also considerable.

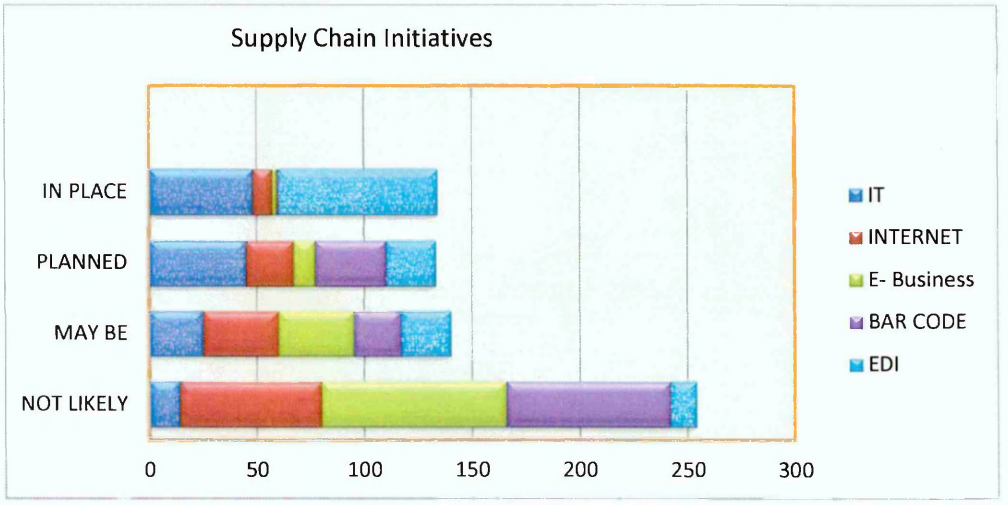

Fig: 5-18 Supply Chain Initiatives

This question concludes that supply chain initiatives of SMEs are behind in term of IT, E – Business, Internet, Bar Code, and EDI. The level information sharing; BAR CODING, E Business and Internet are very low when compared to world class manufacturing industry due to lack in skill, investment and the market where they operated in.

In terms of current consideration for future usage, there are good number of companies were currently considering adoption of IT, E – Business, Internet, Bar Code, and EDI. This is a step in the right direction for the Saudis' SMEs trying to perfect their supply chains. This initiative will positively change the ways that companies communicate with their customer and suppliers. These kinds of IT

applications provide immediate, cost-effective, and more secure shared information between the supply chain players. Further, SMEs that adopted these initiatives will result in an earlier shipment of orders than most of their competitors and can facilitate accurate, frequent, real-time and seamless exchange of information, both internally and inter-organizationally.

5-4-7 Performance Measurement

How important are the following performance measures to your organization?

I- Reliability Assessment

The survey divided the performance measurement in to two main components. They are "Financial Performance" and "Operational Performance". For in depth Knowledge, the components are further divided in to five and four different small dimensions.

The financial performance is divided into "Growth in sales", "Growth on assets", "Market share gain", "Return on investment", and "Profit margin on sales" and the Operational Performance was divided into (4) dimensions as "Volume Flexibility", "Scheduling Flexibility", "Delivery reliability", and "Product quality".

Table 5-21 shows the Cronbach's Alpha (α) values of the main two components of performance measurement. The table shows the Corrected Item-to Total Correlations values too. The Cronbach's Alpha coefficient of the general index (Performance measure) is (0.849), which means that the construct is reliable and can be used in this research. The Corrected Item-to Total Correlations of financial performance is (0.897) and for Operational performance is (0.523). Both values are above the acceptable cutoff value. Thus, those two components are measuring the performance measurement construct.

Table 5-21 Cronbach Alpha coefficient and CTIC of Performance measurement strategy.

Cronbach Alpha coefficient and Corrected Item-To-Total Correlation of Performance measurement strategy			
CONSTRUCT	ITEM	CORRECTED ITEM-TO TOTAL CORRELATION	CRONBACH'S ALPHAα
Performance measurement Strategy	Financial performance	.897	0.849
	Operational performance	.523	

II- Descriptive Statistics

The respondents were asked to rank the importance of the performance measurement strategy to their organization. Figure 5-19 below illustrates the mean importance of Performance Measurement Dimension in Saudi Arabia manufacturing SMEs which has a mean (4.57). These are prioritized as follows; Financial measures (4.73), Operational Measures sharing (4.14). From the table, it can be realized that the main Performance Measurement Dimension is financial measures Dimensions. The overall mean value (μ) of the main construct was (4.57).

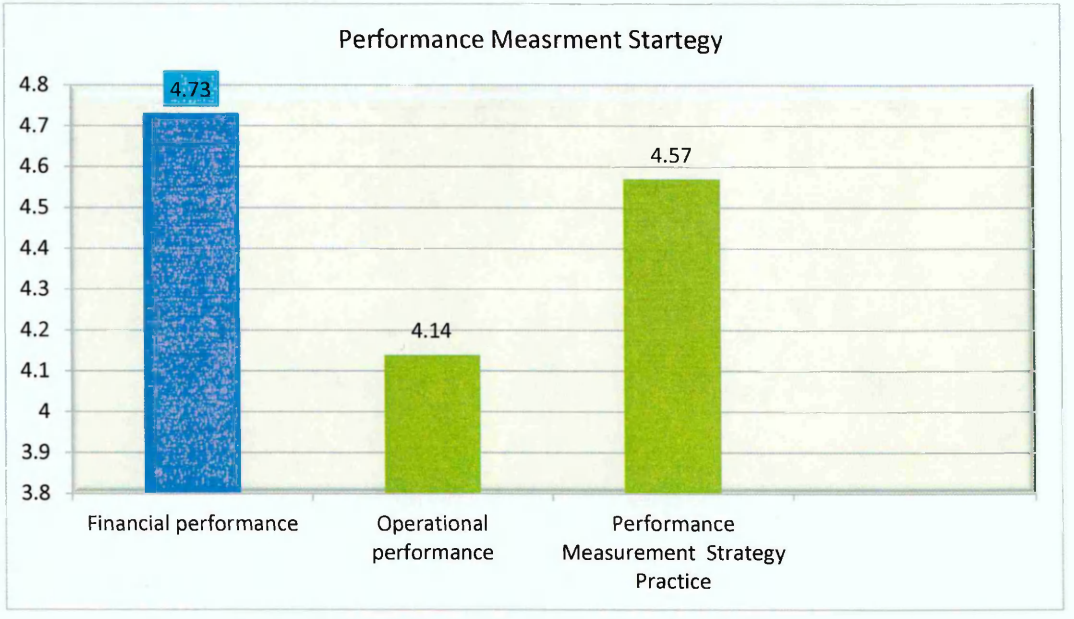

Fig: 5-19 Performance Measurements Strategy

The result of this analysis shows no surprise. It is well documented in the literatures that financial performance behaves as expected. The mean value of financial performance is more important than the operational performance.

5-4-7-1 Financial Performance Measure

Please tick (√)the number that accurately shows the importance of financial performance measure to your organization

I- Reliability Assessment

The data analysis resulted Cronbach's Alpha coefficient with (.760). From the results shown in Table 5-22, it can be concluded that this instrument meets the internal consistency magnitude requirement and is therefore reliable.

Table 5-22 Cronbach Alpha coefficient and CITTC of financial Performance measurements

Cronbach Alpha coefficient and Item-To-Total Correlation of Financial Performance measurements			
CONSTRUCT	ITEM	CORRECTED ITEM-TO TOTAL CORRELATION	CRONBACH'S ALPHA α
Financial Performance measurement	Growth in sales	0.537	0.760
	Growth on assets	0.494	
	Market share gain	0.503	
	Return on investment	0.649	
	Profit margin on sales	0.477	

The survey studied the component of financial performance measurements. The breakdown of financial performance measure resulted in five (5) different dimensions; Growth in sales, Growth on assets, Market share gain, Return on investment, and Profit margin on sales. Table 6-24 shows the corrected item-to total correlations values for each sub scale. Growth in sales (0.537), Growth on assets (0.494), Market share gain (0.503), Return on investment (0.649), and Profit margin

on sales (0.477). All of these values are above the cutoff value which indicates that they measure the financial performance construct precisely.

II-Descriptive Statistics

The importance of Financial Performance was addressed through the use of means value. Figure 5-20 shows that Growth on assets comes on the top followed by Growth on sales. Whereas, Return on investment index has the lower mean value (μ=4.33). Growth in sales has an average mean of (μ =4.56), Growth on assets has an average mean of (μ =4.69), Market share gain has an average mean of (μ =4.39), Return on investment has an average mean of (μ =4.33), and Profit margin on sales has an average mean of (μ =4.52). This analysis brings "Growth on assets" on the top of the rank and "Return on Investment" on the tail of the list. The overall index of financial measurement ha an average mean (μ =4.73) which indicate very important dimension. These values are illustrated in Figure 5-19.

One can realize that all the organizations under study evaluated their performance based on the traditional concept of the performance measurement.

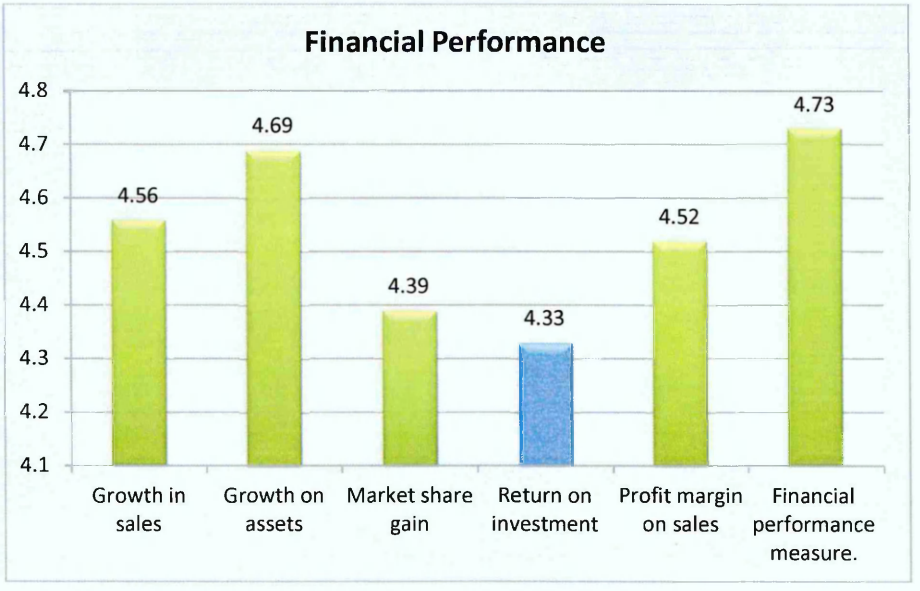

Fig: 5-20 Financial Performance Measurements Strategy

5-4-7-2 Operational Performance Measure

Please tick the number that accurately shows the importance of operational performance measure to your organization

I- Reliability Assessment

Table 5-23 shows the Cronbach's alpha values of the Operation Performance constructs and the Corrected Item-to Total Correlations values. The Cronbach's alpha coefficient of the general index (operation performance measure) is (α=0.848) which means that this construct is reliable. The calculated value of corrected item total correlation is indicating that there is a high correlation between the subscales of Operational Performance Measurement and the main construct.

The Corrected Item to Total Correlation of "Volume Flexibility" is (0.681), "Scheduling Flexibility" is (0.855), "Delivery Reliability" is (0.752), "Product Quality" is (0.667), and customer satisfaction index (0.841). They are above the cutoff value and considered acceptable as they the construct precisely.

Table 5-23 Cronbach Alpha coefficient and CITC of Operational Performance measurement strategy

Cronbach Alpha coefficient and Item-To-Total Correlation of Operational Performance measurement strategy			
CONSTRUCT	ITEM	CORRECTED ITEM-TO TOTAL CORRELATION	CRONBACH'S ALPHA α
Operational Performance measurement	Volume Flexibility	.681	0.848
	Scheduling Flexibility	.855	
	Delivery reliability.	.752	
	Product quality	.667	
	Customer satisfaction index	.841	

II- Descriptive Statistics

The statistical analysis of Operational Performance is illustrated in Figure 5-21. The analysis shows that 'Volume Flexibility" has an average mean of (μ =3.19), "Scheduling Flexibility" has an average mean of (μ =3.07), "Delivery Reliability" has an average mean of (μ =4.55), "Product Quality" has an average mean of (μ =4.67), and Customer Satisfaction index has an average mean of (μ =4.79). The overall mean value of Operational Performance Measurement is (μ =4.47).

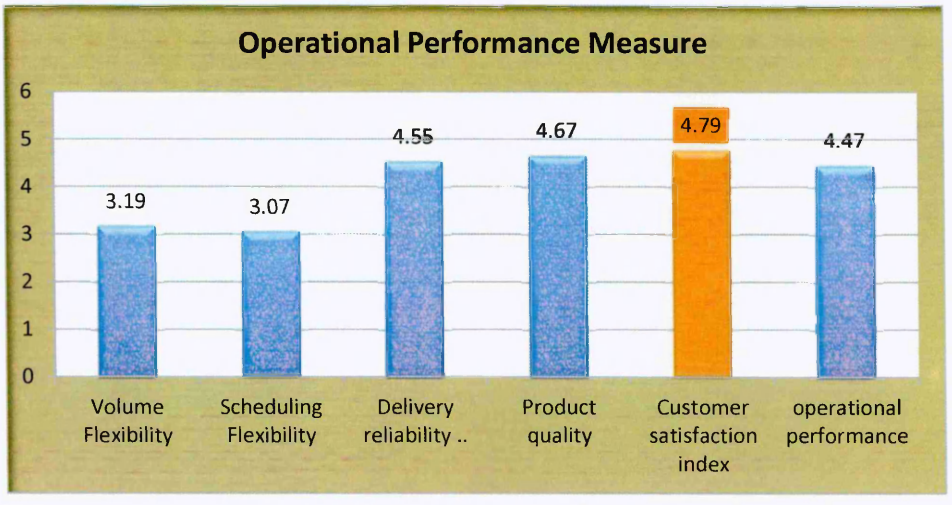

Fig: 5-21 Operational Performance Measurements Strategy

One can notice that the first two dimensions are having the lowest mean values (3.19, 3.07) respectively. This indicates that these two items are not considered within SMEs organizations which are the major areas of concern.

Delivery reliability, product quality and customer satisfaction index are well considered as very important constructs of operational performance measure. But again these measures are traditional, which are normally taking care by all different organizations.

The idea is that the companies in their transition to the new concept of excellence, they should go beyond the traditional measures and look at to benchmark their measures against the world class organizations. Flexibility is one area that

organizations should consider as one of their operational performance especially in uncertain business environment that most of supply chain facing in nowadays.

As competition intensified so did the uncertain business environment. For supply chain be effective and manage their business risk, it should consider manufacturing flexibility within their strategy.

5-5 Summary

This chapter has presented an empirical study which examined the current supply chain dimensions within SMEs in the manufacturing sector of Eastern Province, Saudi Arabia. Based on the findings from the data analysis, the following points can be concluded:

1- Using Cronbach's Alpha index, this study has shown that supply chain Dimensions adopted are valid and reliable. Therefore, this study supports the positive argument concerning the applicability of SCM Dimensions for larger study, different business sectors, and for different geographical areas.

2- Manufacturing strategy was given considerable thrust among the supply chain best Dimensions. The choice between these Dimensions may change over time, contingent on market context and corporate strategy of a company. It is proposed that SMEs look at adopting more manufacturing strategy attributes similar to what world class companies do. Flexibility in production was found as a common strategy within world class manufacturers.

3- Supplier partnership strategy was influenced by supplier selection. For this strategy to be more sufficient, supplier involvement and using few base suppliers should be an integral part of the strategy. After all inclusiveness is an integral aspect of SCM

4- Businesses always see the customers as the reason for an organization being alive and making profitable business. SMEs being suppliers for large organizations, they should pay more attention to develop, maintain and improve their business relation with their customers. Having realized it, SMEs need to develop their

strategy around this understanding. Customer orientation is very much essential for a successful business.

5- Most of the companies investigated failed to comply with basic requirements of logistic Dimension which will jeopardize the supply chain performance of this industry. The study gave some suggestions to overcome these weaknesses as the weakest link above determines the strength of the chain.

6- The study found that most of the respondent companies were not motivated to have advanced supply chain initiatives. Partially, may go to the investments and skills needed and other may go for the awareness on the benefits of such initiatives.

7- It appears from this survey that in Saudi Arabia SMEs performance measurement is more about the financial performance overlooking the importance of operational performance. Despite the overall findings produced in this study, the author believe that this topic still opens opportunities for further studies, particularly considering the fact that industry sectors now have become more dominating sector in the economy of the country.

8- The study has reached to a general conclusion that SCM Dimensions are still in its infancy in Saudi Arabia SMEs manufacturing sector. Even though, they have recognized its importance, implementation of these Dimensions is still lagging in their business strategies.

The next chapter, Chapter Six, will deal with developing of supply chain framework model. The framework model will be thoroughly reviewed, discussed and validated.

CHAPTER SIX

SUPPLY CHAIN FRAMEWORK MODEL, THEORTICAL PART & CASE STUDY IMPLEMENTATION

This chapter aims at developing a framework model for supply chain system of Saudi Arabia – SMEs. The framework is then tested and validated theoretically and practically in designated SME in Saudi Arabia, to see whether it works or it doesn't and why.
The chapter starts with framework model Development, followed by framework model theoretical validation and framework model Implementation; practically validation. The chapter then ends with summary.

6-1 Framework Model Development; An introduction

The previous chapter discussed the feedback of the field survey related to this research. However, to take this feedback and provide a useful framework model for practitioners and researchers, the researcher needs to develop a testable framework model.

This chapter aims at developing a testable conceptual framework model. The objective of the proposed framework model is to help the SMEs to eliminate or reduce the gap and thus improve their supply chain.

The framework model was developed based on literature review, other works in the same field, and the results of the field work study (survey) and the working experience of the researcher in the manufacturing sector for more than 20 years. So this framework model is based on a combination of theoretical and empirical research concepts and practical experience.

This chapter is organized as follows. First, the definition of a framework model is given to establish the proper understanding of what is framework and why it is needed. Second, the framework model is thoroughly discussed. The framework model can be used to identify the gap and compare key items in the current supply chain against the proposed framework model and plan for improvement, which can be done through the self-assessment protocol. The framework model is then theoretically validated and

tested. A case is selected to examine the framework model implementation. Finally, the chapter will be ended by a conclusion.

6-2 Framework Model Definition

Popper (1994) defines a framework as a set of basic fundamental principles, which can help to promote discussions and actions. The authors have defined framework as a set of simplified theoretical principles and practical guidelines for implementation and adoption, which can enhance the chance of success that are easy to understand.

Frameworks portray through diagrams, flowcharts, and graphical or pictorial representations (Yusof, 2000). A framework is used in research to outline possible courses of action or to present a preferred approach to an idea or thought.

Struebing and Klaus (1997) believed a sound framework should define what the organization does, what it is trying to do, how it is going to do it and ensure that each step is done in the correct sequences.

Aalbregtse et al. (1991), for example cited the following reasons for having a framework to:

- illustrate an overview and communicate a new vision to the organization;
- force management to address a substantial list of key issues which otherwise might not be addressed;
- give valuable insights into the organization's strengths and weaknesses, and its overall strategic position in the market-place; and
- Support implementation and to improve the chance of success because it will provide not only overview but also more detailed information describing the content of each framework element and its relationship to other elements.

A question, which arises then, is how one can characterize a good framework that really suits the SMEs. In general, the following criteria can be considered as a guide in developing a good framework to suit the SMEs characteristics (Yusof and Aspin wall, 2000a):

- systematic and easily understood;
- simple in structure;
- having clear links between the elements or steps outlined;
- general enough to suit different contexts;
- .represent a road map and a planning tools for implementation;
- answers "how to?" and not "what is?"; and
- Implementable at reasonable cost and time.

Thus, it is important that these criteria are considered when developing a framework model.

6-3 A Framework Model for improving SMEs supply chain management

To improve the SMEs supply chain capability in a dynamic market, a proposed framework model that is believed to level a company in a better position in the chain is suggested.

The illustration representation given in Figure 7-1 which considered the basis of this study identifies the four major components of the Framework Model. These components are closely inter-related. In many respects, this is a fairly generic framework model that may apply across a number of business settings. A number of typical elements have been identified within each of the four major components. These are the framework model foundation, framework model body, the framework model house roof, and finally the framework model boundary. The components of the framework model are now described hereunder in detail.

- First Component: The framework model foundation
- Second Component: The framework model body
- Third Component: The framework model house roof
- Fourth Component: The framework model boundary

The framework model roof stands for the ultimate goal of SCM competitiveness. Supply chain competitiveness is represented by the financial and operational performance. As

an organization improves its two sub components, its ultimate competitiveness will be improved.

The framework model roof rests on the framework model house body representing the main components of basic SCM, supplier, focal company, customer, and the two flows; information and material. Each part of the company is decomposed into subcomponents as illustrated in the framework model sketch Figure 6-2. For example the supplier part of the framework model body is represented by the three main sub components; supplier selection, supplier evaluation, and supplier base reduction. The focal company is represented by the manufacturing strategy components namely quality, cost, delivery and flexibility. The customer side is represented by customer satisfaction and customer loyalty.

The Framework Model House rests on two blocks of foundation. These are management commitment and supply chain risk management. These two blocks play the role of foundation because of their importance in any new strategy or initiative.

The framework model house is boarded by Deming's "PDCA" continuous improvement tool. This means that every component of the supply chain house should continuously be reviewed and improved to coup with the business changes or challenges. The "PDCA" cycle is a proven tool to improve system.

The framework model is more deeply discussed in this following section, in which each component is thoroughly explained and discussed.

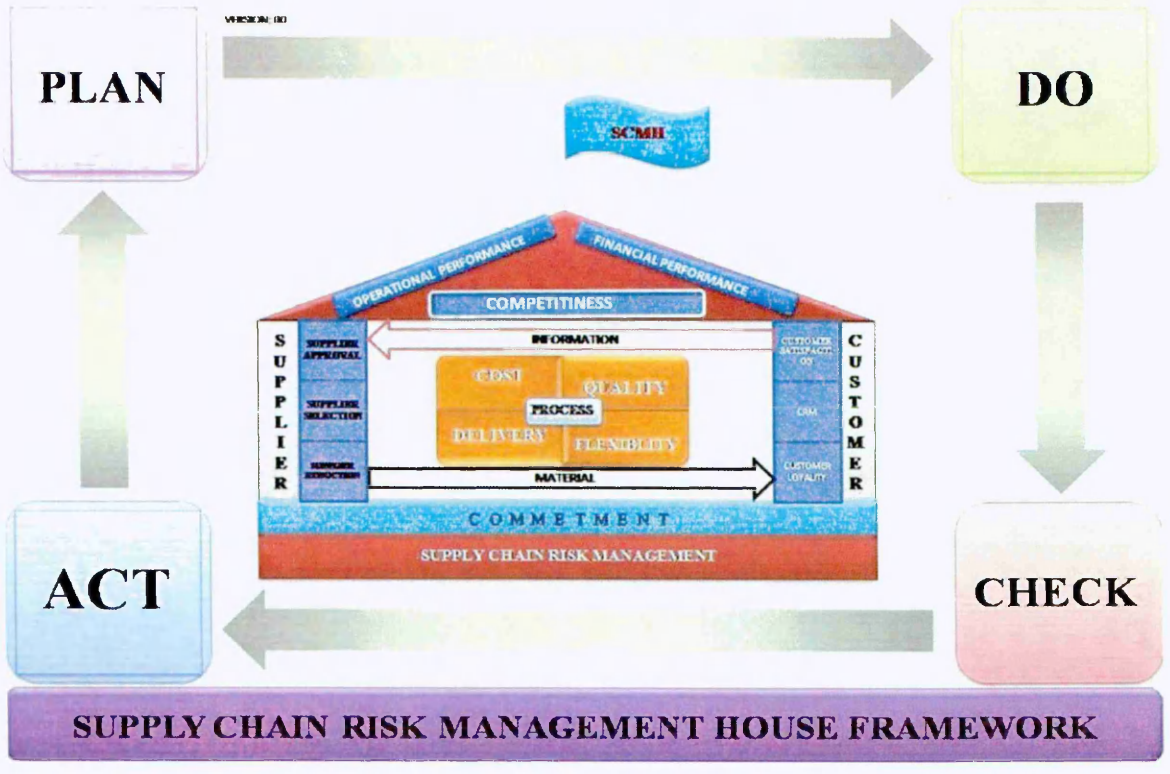

Fig: 6-1 Supply Chain Management House Framework Model

6-4 Framework Model Rationale

The rationale underlying this research framework model is straightforward. First, the implementation of SCM dimensions should be driven and facilitated by management commitment. The management role behind the success or failure of any project initiative is well documented in several studies.

The current dynamic business environment is characterized by high complexity and fiercer competition mainly because of higher levels of manufacturing outsourcing, new technologies, and shorter product life-cycles due to rapidly changing customer preferences. All these and more factors often force companies to assume more ''calculated risks'', risks that managers must accept in order to improve competitiveness, reduce costs and improve profitability. However, the downside potential of the ''calculated risks'' could have adverse consequences that jeopardize the whole supply chain's ability to serve the final customers, thus affecting firms' long-term goal accomplishment (Svensson, 2002).

The business to be sustainable has to be measured. Normally, the business success is measured by financial and operational performance. A higher level of SCM performance will lead to an enhanced competitive advantage and further position an organization in higher level of market lead.

Tompkins et al. (1998) have emphasized the importance of continuous improvement processes within the value chain and subsequently coined the term "Supply Chain Synthesis" (SCS). This is a continuous improvement process that ensures the satisfaction of all players in the supply chain from original raw material providers to the finished product consumer.

Supply Chain Continuous Improvement (SCCI) initiative emphasizes the creation of teams of suppliers, manufacturers and retail customers who share information to improve the performance and effectiveness of the whole chain. SCCI enables the various links of the entire supply chain to work together in response to changing consumer needs and trends. The SCCI initiative can be applied to a supply chain orientation that is either a "pull" or a "push" system or a combination of both.

6-5 Framework Model Components

The following discusses the detail of the framework model components. It starts with framework foundations, framework body followed by framework roof. Finally, the framework boundary is discussed.

I- Framework Model Foundation

The framework model foundation consists of two blocks. These are supply chain risk management and management commitment. The following section will discuss in detail the two blocks.

I-1 Supply Chain Risk Management

a) Introduction

The field of research in Supply Chain Risk Management has received lot of attentions in the recent years for several reasons (Wagner & Christoph , 2006). First, disasters; natural or man- made have increased in number and in intensity during the last decades (Munich , 2006). Second is business competition. Competitive pressures often force companies to assume more ''calculated risks'' (Svensson, 2002)—risks that managers must accept in order to improve competitiveness ,reduce costs and improve profitability.

Another factor is that the business environment characterized by high complexity and hence the supply chain. This is mainly because of higher levels of R&D and manufacturing outsourcing, supplier–supplier relationships in supplier networks, increased dependence on supplier capabilities, new technologies (Internet, RFID), regulatory requirements (e.g., post 9/11 security regulations such as C-TPAT, or food safety controls), shorter product life-cycles due to rapidly changing customer preferences, and international market and production expansion (Stephen & Nikrouz,2009).

In the light of these risks and their inherent consequences, it can be assumed that the performance of a supply chain will be affected negatively. Based on a larger sample, Hendricks and Singhal (2003, 2005) underscore the relevance of supply chain disruptions by showing empirically that these events have a significant negative impact on shareholder value (Singhal, 2003, 2005a) and on operating performance (i.e., sales, operating income, return on assets) (Singhal, 2005b), it can be concluded from their research that capital markets severely penalize supply chain disruptions and attach high value. uttner (uttner et al., 2003) identified be financial losses, a negative corporate image or a bad reputation eventually accompanied by a loss in demand as well as damages in security and health as consequences of supply chain disruptions

b) Supply Chain Risk Management Definition

Agreeing to a definition for the term risk has proved challenging for academics and practitioners alike for over a century, leading to the conclusion that there are probably as many definitions as writers on the theme (Ritchie and Marshall, 1992). The reason for this variety of definitions reflects different academic and professional disciplines and variations in the specific settings, decision contexts and problems being addressed. Sitkin and Pablo (1992) reflect this in their generalized definition of risk as being 'the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realized.' Zsidisin (2003) addressing the supply chain context more specifically defines risk as *the potential occurrence of an incident or failure to seize opportunities with inbound supply in which its outcomes result in a financial loss for the [purchasing] firm.'* Most definitions (MacCrimmon and Wehrung, 1986) of risk comprise three common elements:

- *Likelihood of occurrence* of a particular event or outcome,
- *Consequences* of the particular event or outcome occurring,
- *Exposure or Causal pathway* leading to the event

Most definitions would incorporate the following clusters of activities:

- Risk Identification and Modeling – including the sources and characteristics of risks, what may trigger them and the relationship to the supply chain performance in terms of effectiveness and efficiency.
- Risk Analysis, Assessment and Impact Measurement assessing the likelihood of occurrence and potential consequences.
- Risk Management – generating and considering alternative scenarios and solutions, judging their respective merits, selecting solutions and undertaking the implementation.
- Risk Monitoring and Evaluation – monitoring, controlling and managing solutions and assessing their impact on business performance outcomes.
- Organizational and Personal Learning including Knowledge Transfer – seeking to capture, extract, distill and disseminate lessons and

experiences to others within the organization and its associated supply chain members.

These components of the SCRM approach represent an integrated decision making approach and one which interacts extensively with other members of the supply chain.

c) Supply Chain Risk Management Strategies

There are five risk management strategies to deal with SCRM namely:

1- **Postponement**: Postponement entails delaying the actual commitment of resources to maintain flexibility and delay incurring costs (Bucklin, 1965). Form postponement includes labeling, packaging, assembly, and manufacturing. Building on Perry (1991), who suggests the potential benefits of postponement depend on the uncertainty projected in the operating environment, it is argued that supply chains facing low demand uncertainty will not benefit as much from form postponement as supply chains facing high demand uncertainty.

2- **Speculation**. Speculation (also called selective risk taking) is a demand-side risk management strategy that is the opposite of postponement (Bucklin, 1965). Bucklin (1965), mentions that "the principle of speculation holds that changes in form, and the movement of goods to forward inventories, should be made at the earliest possible time in the marketing flow in order to reduce the costs of the marketing system." It includes such actions as forward placement of inventory in country markets, forward buying of finished goods or raw material inventory, and early commitment to the form of a product, all in anticipation of future demand.

3- **Hedging**. Hedging is a supply side risk management strategy. In a global supply-chain context, hedging is undertaken by having a globally dispersed portfolio of suppliers and facilities such that a single event (like currency fluctuations or a natural disaster) will not affect all the entities at the same time and/or in the same magnitude. Hedging is an expensive strategy because it involves creating multiple options for decision variables.

4- **Control/share/transfer-** Control, share, or transfer of risks takes the form of vertical integration, contracts, and agreements. Vertical integration increases the ability of a member of a supply chain to control processes, systems, methods, and decisions. Vertical integration may take the form of forward (downstream) or backward (upstream) integration, and is therefore, both a supply side and demand side risk management strategy.

5- **Security-** Global supply chain security encompasses information systems security, freight breaches, terrorism, vandalism, crime, and sabotage. Security strategy is aimed at increasing a supply chain's ability to sort out what is moving, and identify unusual or suspicious elements. Security strategy also encompasses working closely with government and port officials to proactively comply with regulations and avoid unnecessary delays at border-crossing points.

As a conclusion, SMEs can look into three risk sources namely demand and supply risk which are the most important issues in supply chain risk management and therefore of high relevance for practitioners and the catastrophic risks which are currently very tropical and is receiving lot of attention. These risks can be managed through the six strategies mentioned above like postponement, speculation, hedging, control / share/ transfer, security, avoidance. All security risks can be addressed, managed and controlled through implementation of ISO 28000 security management systems. As discussed above the supply chain risk management is the need of the hour to remain competitive or to have competitive advantage through supply chain excellence, But the only challenge for SMR is the identification of the risk form the supply perspective, operational perspective , customer perspective and also have control mechanism to address the risk form the environment as these risk vary from industry to industry , from firm to firm from product to product and also from geography to geography.

I-2 Management Commitment

In order to compete in the world markets, organizations are striving to improve their competitive edge, and one aspect of which is supply chain management implementation.

All major competitive initiatives, especially those that demand substantial resource dedication or a dramatic change in organizational philosophy require high levels of management commitment. Supply Chain Management is no different. In their article, (Competing on Capabilities), Stalk et al. (1992) noted that only the most senior levels of management can dedicate the resources and realign the incentives to assure that true cross-functional capabilities are developed. Further, as collaboration moves to higher levels in an organization, the impediments to cooperation seem to grow in magnitude as organizational politics and internal turf issues must be overcome. SCM inherently involves high level of integration, making organizational support a prerequisite to success. Supply chain commitment therefore is found to be the foundation of the supply chain house framework in this research.

TQM and SCM share similarities in a way that both initiatives requiring management commitment and aiming at improving an organization performance. Saraph, Benson, and Shroeder (1989) developed a quality management instrument, identifying eight critical factors of quality management. In the top of these factors comes top management support. Flynn, Schoeder, and Sakibara (1994) developed seven constructs of quality management while Ahire (1996) developed 12 constructs of quality management. Black and Porter (1996) developed 8 constructs of quality management. Zeitz, Johannesson and Ritchie. (1997) developed 7 constructs of quality management while Joseph, Rajendran, &Kamalanabhan (1999) developed 10 constructs of quality management. Rao, and Raghunathan (1999) made a significant contribution by developing and validating a measurement instrument for international quality management research, which consisted of 13 constructs of quality management. All these studies find management commitment is the most important construct for the successful of TQM implementation.

Strong commitment from the top management is vital in supply chain management philosophy. Rao and Raghunathan, (1999) had described this construct as the top management's commitment in providing active and timely support to build the awareness, leading to higher business performance. Most of the other researchers consent to this notion is (Saraph &Shroeder, 1989, Flynn, Schoeder and Sakakibara 1994, Ahire, 1996, Zeitz, Johannesson& Ritchie, 1997, Joseph, Rajendran & Kamalanabhan, 1999). However, Black and Porter (1996) did not include this construct in their study. Instead, they had introduced another construct corporate quality culture, which is about encouragement of a company-wide culture committed to quality improvement. As top management support plays a significant role in encouraging company-wide culture committed to quality improvement the construct 'top management support' is preferred by most researchers.

The top management of different supply chain members should, together, set directions for the operation of the supply chain and create a customer orientation, clear and visible values and high expectations for the supply chain. The top management should commit them themselves to the development of the entire supply chain and should encourage participation, learning, innovation and creativity by all supply chain members. The top management should also commit themselves to maintaining and sustaining the relationship among the supply chain partners. The cultivation of a quality culture for the whole chain and the forming of cooperative and congruent goals among supply chain members are important tasks of the top management of each member in a supply chain.

For successful new management approach, however, leadership must translate its commitment into a set of actions. These actions should be aimed at enhancing the ability to:

• compile and effectively analyze relevant information essential to the firm (customer focus, benchmarking, and supplier quality management);

• collect and make a better use of information flow between supply chain partners); and

• ensure better application of manufacturing, and information technology for better chain performance.

When the leaders of organizations provide direction and resource supporting the new change (supply chain management), higher organization performance is more likely to result.

Thus, starting from material sourcing to delivering the material to the end users, the supply chain management practice (SCM) approach supported by management commitment can be effectively implemented in an organization for achieving business excellence and competitiveness in a world market place.

From the above discussion, one would expect a much better implementation of supply chain practices in firms with top management commitment as compared to the firms without.

II- Framework Model Body; Supply Chain Management

The role of supply chain is widely recognized as being a critical determinant in the success and survival of both manufacturing and service organizations in today's competitive environment, and thus, has focused attention on its effectiveness. In a number of organizations, cost-effective supply chain is a matter of survival. The globalization of some sources makes it essential that the professional practice is improved and regarded as a key element in the preparation of company or organization strategies (Quayle, 1998; Beamon, 1999). For more detail of this component, refer to the literature review (Chapter2).

III- Framework Model Roof ; Competitive Advantages

Performance measurement systems (PMS) has been an area for study and research for decades. Such research studies admit that performance measurement systems (PMS) allow an organization to align its business activities to its strategy, and to monitor performance toward strategic goals over time. It is for such reason, it can play a key role in supporting managerial growth in an organization either for small and medium enterprises (SMEs) or large enterprises (Biazzo and Bernardi, 2003; Garengo*et al.*, 2005). For more detail of this component, refer to the literature review (Chapter2).

IV- Framework Model Boundary; Continuous Improvement

Continuous improvement is a popular concept which is used universally to improve organization's performance and competitiveness in business life. Many companies worldwide have used the concept in their business successfully. The importance of continuous improvement has made it explicitly. Its scope of application is not limited to any size of organization. Large and SMEs industries can use the concept alike, public and semi- public, and encompassed various type of industries.

The increasing pace of globalization has pressurized the supply chain players to offer their product with higher quality and less cost with shortest lead time. The manufacturers thus are focusing on all aspects of their operations aiming to continuously improve their total business and reduce all non-value adding activities to a minimum.

Continuous improvement (CI) has been defined by Bessant et. al,. (1994) as a "companywide process of focused and incremental innovation". According to (Boer et al., 2000), CI is defined as "the planned, organized and systematic process of ongoing, incremental and company-wide change of existing practices aimed at improving company performance".

CI has been viewed for some time as an important element in quality programs. There has been growing use of CI in areas such as cost reductions, flexibility, inter-firm relations and support process improvements. An analysis of the level of development of CI across all aspects of a firm's operations provides a significant indicator of a company's future competitive potential.

The terms continuous improvement and continual improvement are frequently used interchangeably. But some quality practitioners make the following distinction:

- Continual improvement: a broader term preferred by W. Edwards Deming to refer to general processes of improvement and encompassing "discontinuous" improvements—that is, many different approaches, covering different areas.
- Continuous improvement: a subset of continual improvement (Figure 6-2), with a more specific focus on linear, incremental improvement within an existing

process. Some practitioners also associate continuous improvement more closely with techniques of statistical process control.

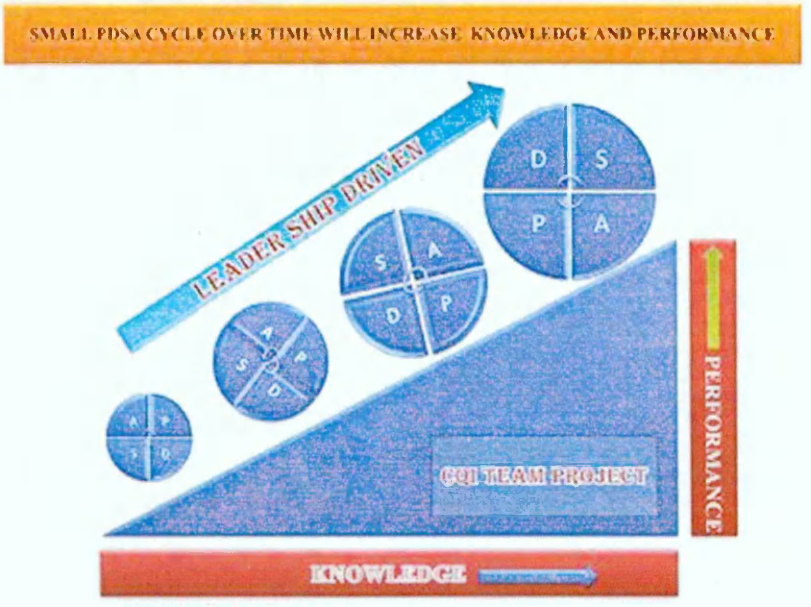

Fig: 6-2 Continuous Improvement Process

There are many tools and techniques commonly used in process improvement such like:

- Problem solving methodology
- Process mapping
- Process flowcharting
- Force field analysis
- Cause & effect diagrams
- PDCA cycle
- Brainstorming
- Pareto analysis
- Statistical process control (SPC)
- Control charts
- Check sheets

- Bar charts
- Scatter diagrams
- Matrix analysis
- Dot plot or tally chart
- Histograms

Among the most widely used tools for continuous improvement is a four-step quality model—the Plan-Do-Check-Act (PDCA) cycle, also known as Deming Cycle or Shew chart Cycle. The concept of the PDCA (Plan, Do, Check and Act) cycle originally developed by Walter Shewhart during the 1930's and implemented and promoted very effectively from the 1950s by W. Edwards Deming, has consequently played a key role in the field of quality control.

After that, 'the Deming Cycle' is developed not only as a quality cycle in the quality control field, but also for different business units as part of continuous improvement cycle which has played a key role in all of the management fields. The "PDCA" cycle (Figure 6-3). It can be described as the systematic study of the causes of variation in quality and an approach to improving quality.

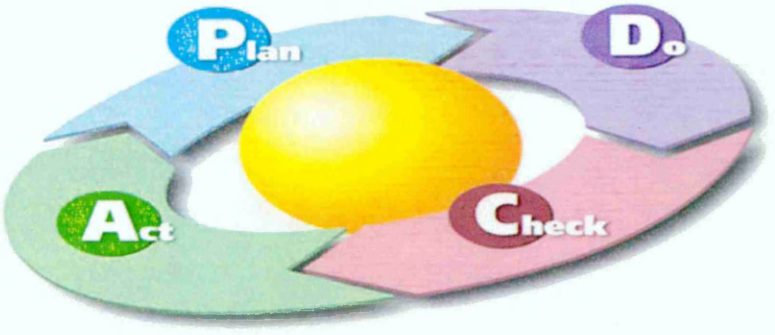

Fig: 6-3 "PDCA" cycle

W. Edwards Deming introduced this cycle in the 1950s. This is a process – indeed, a culture – for institutionalizing continuous improvement in an organization. These concepts form the basis of the Deming's PDCA virtuous cycle of improvement:

1. **Plan:** Identify an opportunity and plan for change.

2. **Do:** Implement the change on a small scale.
3. **Check:** Use data to analyze the results of the change and determine whether it made a difference
4. **Act:** standardize on a permanent basis

PDCA provides a framework for the improvement of a process. It can guide the entire improvement project, or to aid in developing specific projects based on identified target improvement areas.

PDCA is as a dynamic model. Completing one turn of the cycle flows into the beginning of the next. This continual cycle of change delivers ever-increasing improvement. In addition, the PDCA loop provides the continuous improvement mechanism in a model that involves the quality management system concepts of people involvement, process, factual and systems approaches.

A benefit of using the cycle is increased knowledge to understand, predict, and control output. Because this application of the scientific method is cyclical and ongoing, and because the components of profound knowledge interact, the growth in knowledge is much like compounding interest—multiplicative rather than additive.

The aim is to correct the cause not the symptoms in order to eradicate a problem permanently and so effect permanent improvement.

Hamid Noori (2004) studied the application of continuous improvement in the supply chains of Canadian industries. Several Canadian industries including the automotive, electronics and aerospace sectors were examined to determine: (i) what CCI activities were initiated, (ii) which supply chain nodes were the most proactive in establishing these endeavors, (iii) what are the most effective collaborative tools and processes, and (iv) the effect such tools would have on the supply chain performance of participating companies. The results indicate that Canadian companies are placing greater strategic importance on supply chain performance. Supply chain nodes are engaging in joint strategic planning to a greater extent than they did a decade ago.

The choice of supply chain partners can have a significant impact on many aspects of supply chain performance. Working with the right firm can provide an effective way to enter a new market, guarantee good quality raw materials, help diffuse new technologies rapidly, by-pass governmental restrictions, overcome financial constraints and achieve organizational learning (Elmuti and Kathawala, 2001; Monczka et al., 1998). Furthermore, supplier selection is perhaps the most important step in creating a successful partnership strategy (Lee, 2009).

Chong Wu1, and David Barnes (2009) developed and tested a model designed to provide feedback and continuous improvement during the process of supplier selection in agile supply chains. The model seeks to capitalize on the increased application of the supplier section process by applying principles of continuous improvement using Deming model PDCA.

Fig: 6-4 Application feedback and continuous improvement model for supplier selection

Organizational learning (see Figure 7-4). Its aim is to support organizational decision-makers in their efforts to optimize the performance of the supply chain by ensuring that only the most appropriate suppliers are selected at all times. The results of a questionnaire, used to assess the efficacy of the model, showed that the participants found the model was likely to have significant benefits when used in practice.

6-6 Framework Model Assessment Methodology

The following section discusses the self –assessment, its benefits, and the self-assessment process.

I- Self-Assessment

Increasingly, many world class organizations have realized that supply chain management is a way of managing activities to gain efficiency, effectiveness and competitive advantage. This ensures longer term success by meeting the needs of their customers, employees, financial and all other stakeholders. The implementation and assessment of supply chain management program can achieve significant benefits such as increased efficiency, reduced costs and greater customer satisfaction, all leading to better performance for the organization.

Using the Self-Assessment process based on Supply Chain Management House (SCMH) Framework Model has a key role to play in enhancing the effectiveness and efficiency of the organizations. The framework model achieves the objective by reinforcing the importance of each component of the model toward organizational Excellence.

Assessment and self-assessment have during the last few decades been established as important methodologies for improvements. One difference between assessment and self-assessment is that the latter does not involve any external organization of the work, while the first does.

Self-assessment is a device that offers helpful information and clear answers for the most common questions regarding and organization's current level of excellence in

terms of its strengths and areas of improvement on the basis of which top management make their decisions and assist the organization in choosing the right strategy to move forward. Many business organizations are taking help of different quality awards as well as for enhancing their competitive position in the global market (Khoo& Tan, 2003).

There are many definitions of self-assessment provided by writers such as Hillman (1994) but an all-embracing definition is provided by the EFQM (2002):

> *Self-assessment is a comprehensive, systematic and regular review of an organization's activities and results against a model of business excellence.*
>
> *Further, according to EFQM (2002), "the self-assessment process allows the organization to discern clearly its strengths and areas in which improvements can be made and culminates in planned improvement actions which are then monitored for progress".*

Thus, it can be seen from the above definition that self-assessment is a vehicle for systematic continuous improvement in an organization. An extensive study by Coulambidou and Dale (1995) supports this view. The believed benefits of self-assessment could be summarized into the following:

- Identify opportunities for improvement ;
- Provide new motivation for the quality improvement process;
- Direct the improvement process; and
- Manage the business.

According to Lam and et al. (2007) self-assessment has three main elements; model, measurement and management. The first element is "model" which acts as a framework for evaluating business performance. "Measurement" is the second element which measures organizations' performance against the model. The last element is "management" which is concerned with managing the self-assessment process to ensure its effectiveness. Self-assessment is a quality initiative that works both internal and external focus as it is carried out by organization's own staff, but on externally defined standards.

According to Samuelsson & Nilsson (2002) apart from illuminating areas for improvement, self-assessment provides an important cultural benefit because it encourages an ethos of continuous improvement, promotes a holistic perspective, and allows people to gain a broader understanding of the business.

II- Self-Assessment Benefits

Self-assessment aimed to various benefits (Zairi, 1994; Hillman, 1994; Conti, 1999; Porter and Tanner, 1998; Dale, 2003). Van der Wiele et al. (1996) point out that organizations are using self-assessment to identify strengths and weaknesses, and to facilitate internal and external learning in terms of the transfer of best practice and ideas. Brown & van der Wiele (1996) show, on the basis of a national postal survey of self-assessment practices in Australia, that the reasons for using self-assessment are mainly to find opportunities for improvement and to direct the improvement process, while the goals for the introduction of self- assessment are to improve business performance, to drive continuous improvement and to increase quality-awareness in all aspects of the business.

Dale (2003) in his research categorized the objectives in respect to the time frame required as below:

CATEGORY	OBJECTIVES
Immediate	Facilitates benchmarking
	Drives continuous improvement
	Encourages employee involvement and ownership
	Provides visibility in direction
	Raises understanding and awareness of quality related issues
	Develops a common approach to improvement across the company
	Seen as a marketing strategy, raising the profile of the organization
	Produces `people friendly business plans

Long-term	Keeps costs down
	Improves business results
	Balances long and short-term investments
	Provides a disciplined approach to business planning
	Develops an holistic approach to quality
	Increases the ability to meet and exceed customer's expectations
	Maintains a quality image
	Provides a link between customers and suppliers

III- Self-Assessment Process

There is a greater chance of success if the senior management team has an active involvement in the process plus a sound grasp of the SCHM Framework Model and the fundamental concepts of supply chain management. Establishing teams responsible for managing the self-assessment process in the organization, the design of appropriate record forms and the establishment of a method for scoring achievements come next. The plans and objectives for conducting self-assessment should be communicated throughout the organization.

For Self-Assessment to be successful, the top management has to build a clear strategy and communicate this strategy to all employees in the organization.

When considering which specific Self-Assessment technique to adopt, the current culture of an organization needs to be taken into consideration. There are no set rules; the Self-Assessment can be carried out at any and all levels. However experience shows that many organizations first undertake one or more pilots to "test the water" and learn more about the process.

There is no "superior" technique for Self-Assessment. The most important factor is for the organization to have clarity on the outcomes it is looking to achieve and then choosing the specific Self-Assessment technique that is the most appropriate for

delivering those desired outcomes. All employees directly involved in the self-assessment processes and all facilitators should be trained. The introduction of any new process needs careful management. Self-Assessment is no exception to this rule and it is best managed as a project.

Organizations of all sizes have limited resources to allocate in different project. It is important therefore to have a clear process in place for the prioritization of the outcomes, as well as the management of the subsequent improvement action plans and the ongoing monitoring of progress through "business as usual" review cycles.

The outcomes from conducting the Self-Assessment provide the "moment in time" picture of the status of the organization, usually expressed in terms of strengths, areas for improvement.

As with any other activity, progress in implementing the improvement actions should be reviewed regularly and the whole process for linking Self-Assessment and business planning should also be reviewed and improved ready for the next Self-Assessment.

EFQM (1996) summarized the general process steps of conducting self-assessment as shown in the following flow chart (see Figure 6-5):

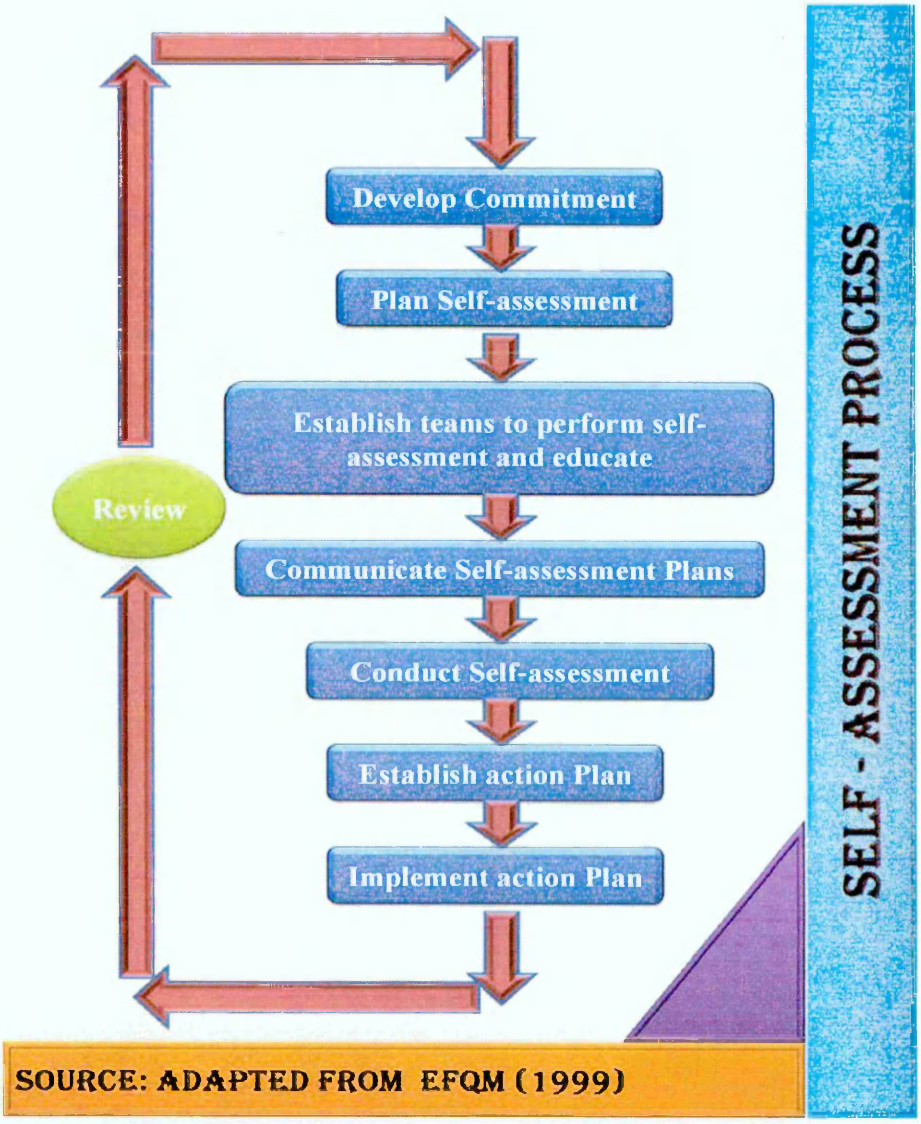

Fig: 6-5 Self-Assessment Process Flow Chart

6-7 Framework Model Validation and Implementation

Due to hard competition all the suppliers are in position to supply their product at competitive price with good quality, in the shortest delivery time. It is identified that it is possible to create competitive advantage through Supply Chain Management. Accordingly, a comprehensive systematic implementation framework was expounded.

Subsequently, the researcher demonstrated the validation of emerged "Supply Chain House Framework Model". The validation was with focus group of a selected firm called ABC (the true name is kept confidential). The company is engaged in the manufacturing of various types of food items that are ready-to-eat. It has been in the business for the past 12 years. It has its factory as well as the processing unit in Eastern Province. The raw materials required are mainly vegetables, chicken, and meat which the company procures from either the local vendors, or imported from various suppliers situated. The required materials are procured with the help of hired transporters.

The company's products are quite popular to many customers. However, the company stands to lose the market due to erratic supply schedules which do not cater promptly to the customers. The packaging of the products is attractive, but it does not preserve the product for a long time. The company has about 10 distribution centers. Logistical information system is not adequate. Due to this, the company is unable to expand its business. In fact, due to competition, there is fear that the company may stand to lose its existing clientele. Due to mismanagement, the company is unable to meet the increase in the demands during festival seasons and holidays.

The validation and testing process is discussed into two sections. The first section 7-7-1 is about "Framework Model Theoretical Validation and Testing" and the second section 7-7-2 is about "Framework Model Theoretical Validation and Testing". These are discussed in the following sections.

6-6-1 Framework Model Theoretical Validation

This section discusses the framework model theoretical validation and testing. It starts with an introduction followed by validation feedback.

I- Introduction

In previous sections the conceptual "Supply Chain House Framework Model" was developed and discussed (see Section 7-3, Fig. 7-3). The aim of this section is to theoretically validate the framework model with a focus group selected from SMEs in the manufacturing sector by discussing its applicability and potential benefits its adaptation will bring in addressing the performance gaps of supply chain management in small and medium enterprises in the manufacturing sector of the Eastern Province of Saudi Arabia.

The focus group was organized by the researcher who briefed the focus group members on the purpose of the meeting which was to explore the suitability and applicability of the framework model for SMEs in the manufacturing sector of the Eastern Province of Saudi Arabia with the aim of improving performance gaps of their supply chain management.

A convenient sampling approach was used in selecting the focus group. The focus group members were selected on the basis of their being in a managerial position in their organization and having a considerable understanding on the concept of supply chain management. The composition of the focus group and their years of experience are shown in Table 5-1 "Focus Group Participant Demographics" under section 5-2-2 item II-1. A presentation was made to the focus group members explaining in detail the framework model, its components and benefits to industries.

Following the briefing and presentation on Supply Chain Management Framework Model, the following points were discussed: the perceptions and opinions of group members on the applicability and drawbacks of the framework.

The participants were allowed to bring up issues and concerns outside the prepared question path to determine the strengths and weakness of the framework model and identify areas needing improvements and further research.

The Questions that the researcher discussed during the validation session were:

1. How far will the implementation of the model improve the performance of the organizations both operationally as well as financially?
2. Does the implementation of the model require additional cost to the organization? If so to what extent?
3. Does the model apply to service sector organizations?
4. What is the effect of the framework model on the organization structure change?
5. Does the framework model need a special skill and competency for implementation?
6. Can the framework model be used as a benchmarking tool for the organization?
7. What are the significant factors that distinguish organizations should consider?

II- Validation and Testing Findings

This section presents the validation and testing feedback of the "Supply Chain House Framework Model". Each participant was asked to present his view and opinions on the framework model. The results are based on the ideas of focus group. It includes combined views and proposals made by focus group members.

The following points summaries the main comments and suggestions made by the focus group members:

1. Responses relating to question one, deals with the implementation of the framework model and how it can improve the performance of organizations both operationally and financially. The respondents emphasized that the framework model of the SCM must be developed in line with the

world class requirements and standards. Hence, the optimal aim of the framework model should enable organizations to position themselves in their quest for world class par excellence performance. The respondents were in favour of the framework since it will improve the performance of their organizations. However, some respondents stated that various aspects of the framework model should be given equal attention during implementation. The respondents also noted that the model should consider the limitation and capabilities of SMEs in the application of SCM framework model.

2. Feedback relating to question two deals with the cost of implementing the model and whether it requires additional cost to the organization. The respondents noted that the cost implication of this framework model mainly depends on their supply chain magnitudes and their present practices in organizations. Overall, there will be a drastic cost reduction resulting in better profitability as a result of proper implementation of the framework model within the organization and with the trade partners. The cost saving could be tangible resulting in less production cost and more market share. In addition, non-tangible cost saving could be in form of customer satisfaction and loyalty. In contrast, it was noted that organizations will suffer loss of customers and market share if aspects of the framework model are treated separately.
3. Responses to question three, relate to how the framework model is perceived in terms of its usefulness to service organizations. The analysis of the discussion showed a clear preference amongst the focus group members for applying the SCM framework model in service organizations. The expected potential benefits that the framework model brings will be alike for manufacturing as well as service industries. The framework model when applied in the service industry should place more weight on the importance of the core component of the framework model and could be adjusted to suit the service industry.
4. Reponses to question four, which was about the organization structure affects. The focus group members stated that though major structural changes may not

be warranted in the implementation of the framework model, the organization should adopt collaborative practices especially in the case of those activities which tend to overlap on two functions. Moreover, the philosophy of the organization should tend towards the customer i.e. all activities and functions need to be customer centric. The main change to the organization structure might be brought by the supply chain risk management. This responsibility could not be overlooked and should be managed and controlled by a competent staff.

5. Response to question five which was related to the skills required for the framework model implementation, a common feedback from the members of the group concluded that, the framework model envisages analytical skills among concerned managers and their decision making competencies. Managers are expected to be comfortable with basic analytical tools and techniques that are required to be competent in understanding and using new managerial concepts to make decisions especially those which overlap two or more departments. They are also required to shoulder more responsibilities that may be needed for the SCM implementation process. However, top management needs to consider that more responsibility may de-motivate people if they are not appropriately compensated.
6. Response to question six, deals with benchmarking, the respondents agreed that the Supply Chain House Framework Model helps companies to assess and benchmark their current state against their requirements. The model is constructed with the view to benchmark the supply chain dimensions of SMEs with that of world class organizations if implemented properly. Since, the model considers customer relationship management it will help the organizations both in the manufacturing and service sector in sustaining a competitive advantage.
7. The feedback on the question Seven relate to the significant factors that distinguish organizations should consider, organizations are different in terms of their people, culture, history, goals, structure, products, services, technologies, processes and operating environments. Therefore, they should combine their own uniqueness with this framework model and consequently develop their own ways to excellence.

6-7-2 Framework Model Practical Validation and Testing

I- Introduction

In the previous section, the conceptual "Supply Chain House Framework Model" was theoretically validated and tested (see Section 6-6-1). The aim of this section is to practically validate the framework model with the same focus group of Section 6-6-1.

To proceed with the practical framework model validation and testing, the researcher developed scale rating matrix (Table 6-1) and a set of questionnaires (Table 6-2) which to be answered by the participants during the focus group session. The participants were allowed to bring up issues and concerns outside the prepared question path to identify areas needing improvements and further research.

Table: 6-1 Scale Rating Matrix

SCALE	DESCRIPTION
0	Poor
1	Fair
2	Adequate
3	Good
4	Very Good
5	Excellent

The table below (Table 6-2) shows the validation questionnaires on the right of the table and the Rating of each question is shown in the left side of the table. The rating column is split into two sub-columns; scale and weight. The researcher analysed the feedback of each question and allocated the proper scale and weight. Accordingly, this table serves as a summary of the practical validation process.

Table: 6-2 Framework Model Questionnaire

I	FOUNDATION	Rating	
A	MANAGEMENT COMMITMENT	Scale	Weight
1	Top management attends and chairs the company's meeting regularly and on time.	5	Excellent
2	Top management provides all resources (financial, people and physical) needed for the business and on time.	4	Very Good
3	Top management is actively empowering, involving and encouraging company's employees	5	Excellent
4	Top management has established a documented procedure for business review.	5	Excellent
5	Top management has set regular follow up and management review program.	5	Excellent
B	SUPPLY CHAIN RISK MANAGEMENT		
1	The company sets clear supply chain risk aims and objectives	1	Fair
2	The company has a methodology in place to identify the internal and external supply chain risks.	zero	Poor
3	The company has implemented supply chain risk program	zero	Poor
4	The company regularly assess the company's supply chain risk	2	Adequate
5	The company regularly reviews and updates the company's supply chain risks.	2	Adequate
II	FRAMEMWORK MODEL BODY		
1	Top management sets (smart) supply chain targets for the company.	5	Excellent
2	Top management has established a documented and systematic procedure for its supply chain management	5	Excellent
3	Top management has plans and methodology implementation in place for its supply chain management.	5	Excellent
4	Top management has established a documented procedure for business assessment.	4	Very Good
5	Top management has set regular follow up and management review program.	4	Very Good
III	FRAMEWORK MODEL COMPETITIVE	2	Adequate

	ADVANTAGES; THE ROOF		
1	Top management sets performance objectives, and goals for the company	3	Good
2	Top management has a methodology in place to identify the KPIs	3	Good
3	Top management involves middle management in setting the KPI,s.	2	
4	The management assesses and reviews the company's performance regularly.	3	Good
5	Top management sets regular follow up to improve the KPI's of the company.	3	Good
IV	**FRAMEWORK MODEL CONTINUOUS IMPROVEMENT; THE BOARDER**		
1	The company has a target to achieve in the number of new ideas and improvements.	5	Excellent
2	Top management has established a documented and systematic procedure for continuous improvement program.	5	Excellent
3	Top management is actively empowering, involving and encouraging company's employees in the continuous improvement program.	5	Excellent
4	Top management assesses the continuous improvement program.	3	Good
5	Top management has set regular follow up and management review of the continuous improvement program.	3	Good

The questionnaire is divided into four parts that cover the framework model components. It involves a set of statement or questions which can be answered by the participants easily. The questionnaire is open ended style and avoids the simplest level, No-Yes answers. Further, the questionnaire employs scale between 0 and 5. The scale 5 represents the excellent level of implementation and zero scale represents the poor level of implementation.

The questionnaire approach is the least resources approach, and can be done very easily. It provides an excellent method for collecting information on people's perceptions within the firm.

II- Validation and Testing Findings

The following presents the detail findings of the practical framework model validation.

1- Framework Model Foundation

This part consists of commitment and supply chain risk management findings.

1-1 Commitment Findings

The interview revealed that the top management (The Director, Managing Director and General Manager) is committed to overall company strategy. A part of their responsibility, the top management provided vision, mission, and policy. They were the management champions and regularly participate in business strategy development of the company.

The company vision sets the company benchmark, whereas the mission statement stated the reason for the company being in the market and type of products. The company policy gave emphasis on the quality, customer satisfaction and continual improvement.

The vision, mission and company policy had been communicated to the company members regardless of their position, and been available in all departments and in the company reception hall.

The commitment of the top management to the quality resulted in achieving the international quality certificate (ISO 9000:2000) in as short as three months.

Production manager quoted…

> ..... *"It was very challenging to start developing the company procedure in this short period of time with all the day to day responsibilities"*

He added....

> .....*that is credited to our top management commitment and support"*

These testimonies summarized the top management commitment toward achieving the company strategy.

As a system of business continuous review and continuous communication, the company runs management review meetings. The researcher reviewed "The management review meeting" documentations and found that MD name and signature available for the last three years.

The meeting would review all related business issues, but in minimum would cover the following;

- Legal Requirements including status of ISO certification and audits
- Business Plan
- Group discussion of customer survey information
- Quality objectives
- Organization chart (Quality manual)
- Result of audits
- Process performance
- Preventive and corrective actions status (ECR and ECO status)
- Follow-up of feedback from previous management review meetings
- Planned changes that could effect the quality system
- Recommendations for improvement

The researcher found that the level of commitment between the middle managements is significantly less than that shown by MD. However, there is a weekly meeting between the middle management and their subordinates, but that was limited to production department.

Reviewing the first part of this questionnaire, it can be concluded that

- It was clear that upper management were committed to making the changes. The top management team had developed a model of management that support the organization continual improvement and values
- Top management team was effectively involved in champion changing and development.

- Awareness and commitment from top management was constantly reflected through numerous reviews of progress.
- Lack of comprehensive implementation of management review procedure in the company at the middle management level.
- There was not strong commitment within the middle management that champions the change and initiates the improvements. Initiatives like awards for the best quality team, the best worker, full attendance of staff and the highest contributor of Kaizen submissions were not found.

1-2 Supply Chain Risk Management Findings

The feedback related to weather the management identified the supply chain risk results, the researcher clearly demonstrated that the management's initiative in identifying the company's supply chain risks aim and objective systemically was found un-satisfactory. The company business strategy overlooked to address the scope, results, targets, and trend of the company's risks for the last three years. There were no performance indicators of risk that can be compared with that of others and depends on a good approach to the problems. The managing director explained the reason and said,

> *"..... This subject never was an issue for discussion in our formal management review meeting....."*

The general manager added;

> *"..... ...we may have analyzed the risk occasionally but that was not based on a strategic plan and decisions were based on opinions rather than facts..... "*

The researcher noticed there was no authority on the senior management level that holds the full responsibility for the identification of risk results to the top management for discussion making.

The interview pointed out that the sources of risk were identified as the practitioners saw and understood them. Most of which are classified as of internal risks natural and of limited scope. The managers focused on the risks to their own areas of responsibility in an ad hoc manner.

For example, evidence found that suppliers were being selected mainly on the basis of price only was seen to be increasing the risks to delivery schedules for the customers concerned, and presumably those downstream.

> *".....Of course it's a problem for us because if they fail to supply a good material, we would be behind the schedule which cause customer complains...."*
>
> *Procurement manager's comment*

This illustrates the management paid little attention toward this subject and overlooked the importance of developing a comprehensive approach to mitigate or avoid the associated risks to their business.

The feedback of the discussion showed the company was challenged with a different types, frequency and complexity of supply chain risk as a result of the business environment. The risks were not of internal natural but with external source too. Internal risks are; price, quality, employee turnover as most of them are contractual. External risks are; competition, legal requirements, technology development, customer change requirements.

The general manager recalls a situation where he could not export a required shipment to the customer who is within the GCC country. He stated that …

> *"...when the shipment reached the custom, the driver was asked to present the food certification, ISO 22000 and HACCP. This certificate was recently become a legal requirement for exporting food product..."*

The discussion concluded with an agreement for the development of supply chain risk mitigation strategy to ensure the smooth flow of goods end-to-end across the supply chain, at the promised service level, at anticipated costs. The approach should describe what, why, how and that should be linked to the company's strategy.

The company did not establish well documented procedure to identify and apply the supply chain framework model including the path, key players, organization, roles key risk and threats involved in implementing supply chain activity. Thus, the implementation based on treatment plan for selected identified risk, has been visualized in many cases. Top management did not develop any training program to improve the staff skill in identifying, and mitigating supply chain risk management.

The company treats the risks either internal or external in reactive base. The researcher found no evidence of proactive risk plan strategy that predicts the type and seriousness of risk and act according to contingency plan (Plan B).

In conclusion, an ad hoc approach and reactive strategy which has not been thought through and tested will not safe the supply chain of disturbance. In a good organization, the approach is visible to and usable by the workers, and used in a systematic way, to ensure full implementation, and in areas which are strategic for the organization.

The researcher was unable to gather or verify a systematic deployment of risk procedure. Therefore, looking for assessment or review documents of supply chain risk management was unworthy process. This is a proof for serious problematic issue in this company. The attention given to this area is very low. Consequently, the company loosed some good share of market in many occasion. Developing systematic approach to deal with this subject could be considered a good area for business improvement.

2- Framework Model Body Findings

The organization has results to show what it is achieving, in core areas; suppliers, process and customers. It demonstrated strongly positive trends in most results in suppliers, process and customers over at least 3 years. The company is implementing quality management system in the process activity attempt to achieve competitive priorities (objectives) .The company selected appropriate targets for each core business areas, based on goals and company objectives. These targets were detailed in each business unit. Times to time, the analysis of these objectives are evaluated and any deviation or negative trends were reviewed, discussed, and explained in the company

congress. Most results can be shown to have been caused by the approach taken. The interview failed to provide any external benchmarks or comparisons with other organizations' performance. It was accepted in the research that comparative analysis needs to be address. This could be considered an area for improvement to find out the best practice in the industry and carry out benchmark. This will position the company a head of its competitors. The detail results of the investigation for the main core business units are shown hereunder. This section will discuss the following areas:

1- Suppliers Component
    1-1 supplier selection
    1-2 supplier evaluation
2- Process Components
    2-1 production
    2-2 safety
    2-3 Quality
3- Customer Components
    3-1 customer satisfaction

The detail discussion of each is presented hereunder.

1- Supplier Components

1-1 Supplier Selection

Purchasing and suppliers are of major strategic importance to ABC. A substantial amount of the resources used by the company are made available through its suppliers. Purchases from suppliers account for almost half of total costs.

In order to control and develop its suppliers, ABC evaluates their performance with regard to many different criteria. Supplier selection criteria based on qualification is used to build profiles and find the matches who build the criteria. These criteria are divided into four dimensions; quality, delivery, cost, and flexibility.

1-2 Supplier Evaluation

When new suppliers are selected the process for approving the supplier based on the pre-qualification criteria are implemented. The supplier performance is evaluated by purchasing department with respect to supplier's overall performance. Evaluation includes criteria addressing the supplier's capabilities regarding Quality, Logistics, Production, Internal management, Supply management, Environment, Engineering, Finance, Technical support etc. An audit visit is scheduled whenever serious defect or change in the organization structure happens. The supplier evaluation is carried out once in six months based on the criteria, supplier score cards matrix is evaluated and degree of fulfillment the supplier is ranked.

2- Process Components

2-1 production

ABC showed considerable progress in sales volume and profit margin and market share for the last three years. The sales were increased between 24% to 26% year and after. The revenues were up 23% for the last year.

The company has improved its market share by 3%. Egypt and Sudan were the new market areas in which the sales could be increased to 2% for the first years.

The company has adopted operation strategy as a collective pattern of coordinated decision for the allocation of modern automatic machine and other's resources, the last two years have seen substantial changes in the operations especially with the new investment in technology and state of art of the laboratory equipment. The company expects the payoff in coming years.

The preventive maintenance program of machines and objective to reduce the breakdown hours has increased the production capacities by 5.4%.

2-2 Safety

Safety is a key issue in support of production. Safety is measured by number of accidents happened during a year. Safety accidents were classified into major and minor. The foremost is what treated in outside clinic whereas the minor accident is those cloud be treated in the company clinic. There are two main objectives of production free accident, firstly to maintain the most important asset of the company, people. Secondly is to maintain the momentum of the production. The company promoted the safety awareness and safety orientation program like Mock drill, Fire and safety and first aid training within its facility. The table below shows the number of people and days that the company spent in promoting the safety awareness. Table 7-3 shows increasing trend between year and after.

Table: 6-3 Number of People and days that the company spent in promoting the safety awareness

Number of People and days that the company spent in promoting the safety awareness				
TRAINING	**UNIT**	**YEAR 2008**	**YEAR2009**	**YEAR 2010**
Safety related training	people	38	56	69
Safety related training	days	49	97	144

2-3 Quality Performance

The company has implemented many quality and compliance program based on the requirement of international standard (ISO 9001:2008), FDA and food safety management system like HACCP criteria.

ABC evaluation of the quality of the products starts with receiving the product from the suppliers. Quality defects are reported to purchasing department for the claim. Feedback is given to the supplier that takes corrective actions. These evaluation procedures are conducted for every dispatched product before put in use in the production line.

In the span of 12 months there were only 02 cases identified against 213 supplies cases were supplied material was not meeting the specified criteria. The respective supplier

has been communicated and the way the supplier handles the situation was of major importance for the evaluation.

The interview proceeded to assess the process approach of the company ABC. It was found that ABC has established and developed working approach to define the processes. The working approach is in compliance with the Quality Management System in accordance to the International Quality System, ISO 9000:2008, see Figure 6-6. The system defines and develops the processes in line with quality system framework shown.

The development of the organization operation framework was with the assistance of external advisor and the involvement of the management and the department head responsible. The system indents to outline the responsibilities and process flow from procurement, design, value adding, and control to delivery in order to fully satisfy, and generate increasing value for, customers and other stakeholders.

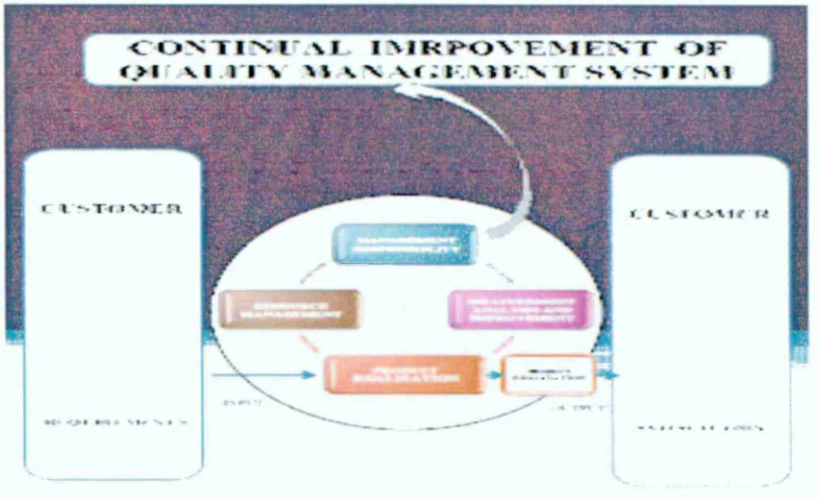

Fig 6-6 ISO 9000:2008 Conceptual Framework Model, source: ISO 9000 Standard

The quality System documentations are structured in four levels of documentations.

These are:

Level I: The pyramid is topped by the single, overarching Quality Policy that guides the organization in all decisions.

Level II: The Quality Manual defines responsibilities and the general guidelines for completing particular task. It was developed to provide the philosophy of the system and describes links between the business operations and the delivery of the business goals and key performance measurements.

Level III: Documented procedures and work instructions that define precisely how to complete a specific task. Each department function has generated its own lists of key processes, and documented as Standard Operation Procedure (SOP). This document was maintained with each department head. It reviewed and revised annually whenever needed. The departmental procedure links between department/functions or other departments, to prevent causing serious interface issues.

Level IV: Records and forms which describe the work completed accurately.

From the evidence reviewed, the researcher confirmed that the structures of key processes and support processes were defined, flowcharted and integrated. Linkages between customer requirements, process measures and standards were being identified. The business management system describes links between the documentation produced for the system and the delivery of the business goals and key performance measures.

The researcher verified the deployment of the company operational framework through; departmental meeting, documents review and site visit. The assessment started with a short meeting with the department in charge to understand the department procedure and methodology. The inputs were counterchecked with departmental procedure, forms and records. The assessment was made for three departments for the time constraint. They are marketing department, production and quality control department.

The approach (The company quality manual) was distributed to all departments. The distribution was documented in the transmittal sheet which specifies the copy receiver name, copy number and the signatory. The review concluded the approach was used and

followed systemically structured way in all aspects. The system was followed systemically. It was accompanied with all necessary forms and documents. The system deployment is assessed annually or semi-annually to verify the implementation. The discrepancy found is adjusted and rectified to maintain the proper implementation of the system. The organization does not do the assessment to know their assessment results and scores; it also wants to know their strengths and areas for improvement. This process is meant to add value for the organization continual improvements.

3- Customer Component

3-1 Customer satisfaction

In ABC case, the aim is establishing ideal partnership relation with customer on business transaction. The customer relations are handled with a proactive orientation to prevent dissatisfaction from the supplied product/service.

The company surveys its customers concerning complaints, satisfaction, and loyalty. The latest survey, a total of 45% participated in the survey. The customer visit and qualitative feedback from the various customer compliments and complaints were evaluated on customer satisfaction index. The results show that there was high satisfaction concerning the business relation, price and quality. The customer satisfaction index (CSI) was 82. On in the other side, there was low satisfaction concerning delivery lead time and flexibility. The company has to choose best methods for customer retention. The overall results show most of the customers surveyed were satisfied with more than average (CSI 78).

The deployment process of the operational approach has been monitored by the assessment and review process to identifying and prioritizing the process improvement and learning which is a continuous activity which is the duty of all members of staff and in particular process owners. The assessment and review process is about regular measurement of system effectiveness and identify and share best practice and improvement opportunities. The review is made against the preset company's KPI's.

The review frequency of each KPI is shown in Table 6-4 below. The table also shows the main sources of improvement.

Table: 6-4 The main sources of improvement and its frequency

The main sources of improvement and its frequency	
MAIN SOURCES OF IMPROVEMENT	**FREQUENCY**
Internal System Audit	Once (maximum twice per year)
KPI	Twice per year
Suggestions Box	Once a year
People satisfaction Feedback	Annual
Customer satisfaction survey	Annual
Management Review congress	Annual

3- Competitive Advantages Findings

In reviewing the performance measurement of the company, the researcher identified a general goal which was set in the business plan. In addition to the traditional financial, there are few non- financial performance indices found for business control.

The company does have financial department occupied by skill and competent staff to monitor and control the financial and accounting system of the company. However, the company failed to present comprehensive, balanced and cross functional measures and ownership that working together in an optimum fashion to achieve the results desired by the organization.

The general manager quoted that.....

"*.....We never used to have a detail KPIs for each business unit. Our focus mainly on how to achieve what was agreed in the business plan....*".

It was understood from group discussion that implementation of a new performance measurement system can be seen as "changing the rules of the game" or redistributing power in the organization. Individuals and groups may see this as not being in their best interest and actively or passively resist the implementation.

Concluding on the findings above, the company maintained financial report and two operational reports. These are the daily production report and people appraisal. The foremost id reviewed by production manager in daily bases and the second is reviewed in annually bases.

The assessment was not carried out in systematic and formal. Except for the financial report which regularly assessed by the top management in more frequent and annually reviewed by the external auditor, none of the performance indicators assessed in systematic fashion.

The researcher failed to find benefits gained or improvement made out of this assessment. There were no evidences of linking these measures to overall business strategy. Also there was no clear evidence on how these measures benefited the business outcomes or how to improve the business performance.

The discussion revealed that few lessons that the management learned from their assessment which particularly takes a financial figures. Learning activities include internal benchmarking, industry benchmarking or comparisons with the processes of best in class organizations were not found rare. They were not used comprehensively for continual improvement, better customer services and innovation.

4- Continues Improvement Findings

Responding to the last component of the framework model that is continuous improvement, the discussion revealed a general agreement on the importance of this component as a tool of to maintain a sustainable competitive advantage of their supply chain management.

The general manager emphasized on the company strategy of encouraging and motivating everyone in the company to participate in improvement process. He said,

> *".....the Company in compliance with the requirements of international quality standard ISO 9000:2000 set the system of*

continuous improvement. We distributed what called "Suggestion Box" everywhere in the company...."

The researcher reached for a conclusion which arrived at, the results for the continuous improvement were clear at the higher level of the organization. During the documentation review and site visit, the management presented different improvement cases. Accordingly, it can be realized that the management is committed to the continuous improvement process that aimed at improving the organization efficiency. Responses showed a clear preference amongst the group candidates for accepting the system of continuous improvement in their organization as an aiding tool that facilitates the improvement process.

Respondents in their feedback on the availability a clear and well defined approach for the continuous improvement, the quality assurance confirmed the availability of such approach, and stated;

".....the continuous improvement system was developed by a team of management that includes general manager, purchasing manager, production manager and human resource manager. The system includes scope, purpose reviewing and rewarding system....."

The respondents in their feedback to the approach part of the questionnaire, it was found out that the approach has a clear rational, well defined and developed in line with the management quality policy. The approach in brief is divided in three sections. Committee coordinator collects the suggestions from the boxes. The, the committee reviews the suggestions. Finally, the management rewards the winner.

The production department was the prime implementer of the continuous improvement system. The ideas reviewed brought enough evidences of the deployment to the researcher. During the site visit to the plant, different quality and safety posters and slogans were found. The improvements were in reduction of using the spare parts, product defect reduction and safety enhancement. However, it was very seldom to find similar improvements at the rest of the company departments.

The extract from the group discussion, site and office visits showed the system was implemented soundly. The conclusion was reached based on many observations. There were general agreements that the system was developed, the management was committed, and well communicated throughout the company. However, the deployment was limited to a single business unit, the people were not trained in using the proper tools (7 improvement tools) which make the implementation and the creativity processes in an ad hoc fashion. Improvements can also be carried out through a tool called "Pathfinder Card", which helps identify the opportunities of improvement and plan the action of improvement.

The discussion went further with management to justify the researcher final conclusion. The researcher briefed the benefits of making the improvement process has its scope and with line to the business unit's objectives. It is also necessary for the people to be trained for using the quality improvement tools.

Accordingly, the management showed clear preference for applying the quality improvement tools and to be a part of the training program. The quality control manager stated.

> *"……this will improve the people way of thinking which ultimately improve their performance……"*

The company through its improvement committee assessed the improvement initiatives. The assessment is made in compliance to improvement system procedure.

The changes brought up by the production team were documented and implemented. Accordingly the production process procedure and work instruction were revised to anchor the changes. The researcher realized the new initiatives were adopted by different production teams which support the wealthy communication between the staff. There were many lessons were learned from the production team and these lessons were exchanged between them. However, adopting the system to different business units coupled with proper training will identify more opportunities for improvement. Some of these improvements could be generalized and be beneficial to the organization.

To summarize, the management's journey for continuous improvement has resulted in a strong commitment to the principles of excellence. However, the deployment of the approach was limited to a single business unit. The organization has systematically established sound linkages between the approach and the results they have achieved, so that they were able to demonstrate some improvement. For broad achievement of improvement, the procedure should be deployed to the whole organization.

5- The feedback of Trade partnerships

Next to the focus group discussion with the company's official, feedback and an interrogation session was carried out with the company's business partnerships; supplier and customer regarding the business relationships performance. The pros and cons of the company were identified and they are summarized as follows;

Performance excellence in the company as stated follows:

From the supplier point of view, there were no problems found with the company in its performance, relationship tie ups and other transactions ever since the company had its establishment with the supply chain. So it was considered to be a positive feedback from the supplier's side.

From the customer point of view, the reasons for the diminished performance of the company can be listed out as follows;

1) The customer felt that there was no efficient supply chain to meet with the requirements at the time of need which might be due to logistics and distribution of products.
2) Due to lack of proper framework in the company, the customer felt a lag in systematic flow of goods.
3) There was a communication problem always existed between the customer and top executive panel due to total power residence of the company with the middle level management.
4) The lack of flexibility with the middle level management created unrest among the customers though they received quality products at good cost.

Based on the feedback obtained from the customers, the top level management assured that there will not any discrepancies in future regarding the problems stated.

From the managers' point of view, the company's performance can be stated as follows;

1) Since the entire attention was focused over the volume of sales, the customer needs are not well evaluated at the time of need.

2) Due to least importance given to quality of supply chain, there was no KPI (key performance indicator) established for the same which played a major role in diminishing the company's performance.

3) The improper functioning of the supply chain in the company shows that all departments of the company were not interfaced properly which have resulted problems in distribution of foods

4) Although meeting was conducted periodically, it never focused towards the entire function of the company.

To solve these problems, a meeting was organized among the management crew of the company and a set of possible alternatives were asked to be submitted. The alternatives were;

1) **For the customer problem No 1**:
    - The company should appoint a supervisor to give a period status about the distribution.
    - Setting up a separate strategy and a team for supply chain.
    - The current strategy of the company should be reviewed that it focuses on all the areas of operation.

2) **For customer problem No 2 :**

- Implementation of technology in supply chain.
- Framing the objectives using the experts.

3) **For customer problem No 3 :**

- Interfering of top level management in decision making.
- Making an appraisal competition between the department managers to motivate them.
- Organizing a meeting every six months to acquire feedback from the customers.

4) **For customer problem No 4 :**

- The requirements of the customers should be analyzed before getting into action.
- Educating the managers about the importance of SCM periodically

After listing out the alternatives, the top level management goes for an apt solution and it is summarized as follows;

- The company will set up a strategy and individual team for supply chain by an expert team after sufficient research in the particular field.
- The company hereafter will analyze the complete needs and wants of the customer before distributing the goods and a separate meeting will be organized periodically to get feedback from the customer.
- The same meeting was extended after a break to discuss about the alternatives for the causes given by the managers of the company. They were listed as follows;

1) **For the manager problem No1 :**

- The alternatives are middle level management should be aware of about the value of the customers and timely delivery of the service to the customer.

2) **For the rest of the problems**, the alternatives are as follows

- Implementing the technologies in SCM.
- Outsourcing the SCM.
- Setting an individual KPI for each department.

7-8 Summary

This chapter reviewed and discussed the importance of developing supply chain framework model for the SMEs manufacturing industry in Saudi Arabia. The framework model was developed based on literature review, other works in the same field, and the results of the field work study (survey) and the working experience of the researcher in the manufacturing sector for more than 20 years. So this framework is based on a combination of theoretical and empirical research concepts and practical experience.

The framework is then tested and validated theoretically and practically by self-assessment approach with a focus group selected from SMEs in the manufacturing sector by discussing its applicability and potential benefits its adaptation will bring in addressing the performance gaps of supply chain management in small and medium enterprises in the manufacturing sector of the Eastern Province of Saudi Arabia.

The focus group members were selected on the basis of their being in a managerial position in their organization and having a considerable understanding on the concept of supply chain management. Details of the preparation of the focus group formation characteristics were verified.

The framework model theoretically and practically validated and tested. As such the "Supply Chain House Framework Model" found to be feasible and applicable and some of the group members showed enthusiasm in applying the SCM house model in their companies. However, in order to attain the maximum advantage of the model, the SMEs need to devote exceptional time and a lot of managerial and administrative efforts in order to change the quality cultures and their institutional work environment.

The researcher thereby illustrated the effect of the process of formulating the focus group perceptions and feedback on the adoption of the SCM House framework model in a format which could be practiced in the selected firm.

The next chapter is indented to highlight the conclusions, contribution, research limitations of the whole research study and presents the future study.

CHAPTER SEVEN

CONCLUSION, CONTRIBUTION, LIMITATION AND FURTHER STUDY

This chapter summarizes the findings of the research and contribution, outlines its limitations and highlights the future studies opportunities to the subject area. The chapter starts with the research's conclusions, followed by its limitations and ends with the research future opportunities.

7-1 Conclusion

Organizations are fast realizing the immense potential of a proactive supply chain to improving their market positions in this cut-throat business environment.This research aims at developing a framework model that enables SMEs to improve their SCM performance and to have a sustainable business growth in dynamic environment. To fulfill the foremost aim, the following objectives have been set.

1. To contribute to the bod of knowledge to the both Supply Chain Management and Saudi Arabian SMEs manufacturing by reviewing pertinent literature of the same field. Knowledge in this study refers to as information, understanding and skills that one gain during research and education (Chapter 2).

2. To investigate the current SCM practice of Saudi Arabia SMEs manufacturing sector by explorative approach, broad reliable and valid survey questionnaires distributed to 320 SMEs companies (Chapter 4).

3. To identify the gap within the current supply chain dimensions of SMEs against world class companies (Chapter 5) by statistical analyzing the survey questionnaires developed in chapter four.

4. To suggest appropriate methodological design using robust techniques that is to developed framework model (Chapter 6).

5. To develop qualitative assessment approach in the form of focus group to theoretically and practically validate and test the framework model (Chapter 6)

6. To benchmark the developed model with different model in the same field.

The Literature review revealed that supply chain management evolved from different disciplines. It provided a historical evolution background for better understanding the subject. The literature highlighted different definitions and descriptions of supply chain management that developed over the time. The body of knowledge in this subject presented numbers of benefits that organization could gain from the effective adoption of proper supply chain system.

Supply chain dimensions are key concept in the supply chain framework model. The framework aimed at effectiveness the organizations through the appropriate and implementation. The literature (Chapter 2) as well as the field work data analysis (Chapter 5) studied and discussed the main components of supply chain dimensions which believed to be a must in any supply chain structure.

This research study is focused on Saudi Arabia SMEs. They are representing more than 90% of the total business in Saudi Arabia. Despite SMEs supply chain benefits, they continue to encounter barriers. Some of these barriers come as a result of corporative culture.

The importance of organizational culture is well documented to the success of a corporative. The improvement success is more likely where the cultural elements of a leadership, supplier relationship, customer focus, continuous improvement, and teamwork and employee involvement are stronger. Those elements are likely to be stronger where SCM is implemented.

Most if not all of change initiatives like SCM adoption failures – and failures of other such initiative– are not only the failure of the management. Often, managers are victims of that culture, just as change itself is a victim of the implementation process.

This is especially an issue of Saudi Arabia corporative where services are provided by multinational group of people with different cultural values.

The author shaded light on some important elements to the success of SC implementation that is related to Saudi Arabia SMEs. These elements are but not limited to, senior management leadership, customer relationship, and teamwork.

The importance of soft issues in the implementation of SC is well documented and recognized in the literatures. Among these soft issues is leadership.

Saudi Arabian SMEs are mixed of local and multinational companies. The multinational companies are either fully foreign ownership or joint venture ownership. Accordingly, the management schools are varies among local firms in Saudi Arabia and other multinational companies.

The management style of Saudi managers is influenced by different variables like gender, level of education, and the organizational position of subject managers.

In many Saudi Arabia SMEs, the vision, mission and strategic plan are not clear and limited to ISO certified companies. The primary focus of these companies is on short-term strategic goals which tend to be financial in nature.

Customers and buyers are always part of the cycle in the system. They are the heart of the business to keep the company alive and successful even high pressure is at stake in nurturing good relationship. Many of Saudi SMEs have limited finance to invest in big campaign in advertising. This limitation is a hindrance to connect the clients. On the other hand, the system of measuring customer satisfaction is limited to ISO companies. It is not a discipline or norm of SMEs to measure their customer satisfaction in systematic way.

It is necessary to apply different strategies for the benefit of the corporative especially looking at the teamwork provided by each leader in an organization. Teamwork is a transparent joint cooperative effort to work together as a team in achieving same goals.

Saudi Arabia business culture is made up of different nations. Each nation has its own language, values, attitude and beliefs. They are also different in knowledge, experience and interests. These characteristics hinder the creation of harmonized group of teamwork. Communication is the most common obstacle while working efficiently as a team. Leadership role and responsibility

of the team remain vague throughout the given time frame. The output of their performance is adversely affected.

The research adopted multiple research method for data collection. The aim behind using the multiple research approach was to draw the strengths and minimize the weakness of each approach.

The conclusion on supply chain literature and field work data analysis may cover the following key issues:

- It is well recognized that adoption of supply chain management principle is one approach which has been demonstrated to provide success business competitiveness. It is making an increasing positive impact in world industry.

- The globalization has changed the business environment and behavior all over the globe. The globalization has led to an increasingly competitive marketplace. Organizations competing in an increasingly global market, independent of size or industrial sector, are reliant on SMEs to provide sub-contracting facilities. The success in such business environment will indeed increasingly be based on quality, cost, delivery and service provided. Globally, increasing competition has caused the business to be improved.

- With the help of the following points, the researcher could conclude that why SMEs were selected as study area for this research (Chapter 3). SMEs represent more than 90% of overall business enterprises in most of the countries. They are the vital engine of nation's economic prosperity, a good provider of employment, seed-bed for indigenous entrepreneurship, adaptability according to customer requirements, to promote indigenous technical knowhow, represent main entity in supply chain linkages; SMEs are often suppliers of goods and services to large companies , therefore, imperative for SMEs to meet the highest level of business relation, as large organizations need assurance of seamless flow of the business without any interruption. Moreover, many studies of supply chain management focus on the practices of large firms, while small firms are treated mostly from the viewpoint of larger

firms (Chopra and Meindl, 2001; Lambert and Cooper, 2000). Therefore, more research efforts are needed to study the impacts of SMEs in the context of supply chain management. Since the long-term sustainability of SMEs depends on "where they compete" and "how they compete".

- Supply chain dimensions adopted were valid and reliable. This was supported by using Cronbach's Alpha index. Therefore, this study supports the positive argument concerning the applicability of SCM dimensions for larger study, different business sectors, and for different geographical areas.

- Manufacturing strategy was given considerable thrust among the supply chain best practices. The most chosen manufacturing strategy contents were quality, cost, delivery and flexibility. The choice between these manufacturing strategy contents may change over time, contingent on market context and corporate strategy of a company. It is proposed that SMEs look at adopting more manufacturing strategy attributes similar to what world class companies do.

- Supplier partnership strategy was influenced by supplier selection. For this strategy to be more efficient, supplier involvement and using few base suppliers should be an integral part of the strategy. Having said that, SMEs need to develop their strategy around this understanding. After all-inclusiveness is an integral aspect of SCM.

- Businesses always see the customers as the reason for an organization being alive and making profitable business. SMEs being suppliers for large organizations, they should pay more attention to develop, maintain and improve their business relation with their customers. Having realized it, SMEs need to invest more in technology which support the customer relationship strategy. Customer orientation is very much essential for a successful business.

- Most of the companies investigated failed to comply with basic requirements of logistic practice which will jeopardize the supply chain performance of this industry.
  The study found that most of the respondent companies were not motivated to have advanced supply chain initiatives. Partially, may go to the investments and skills needed and other may go for the awareness on the benefits of such initiatives.

- It appears from the field work survey that in Saudi Arabia SMEs performance measurement is more about the financial performance overlooking the importance of operational performance. Despite the overall findings produced in this study, the author believe that this topic still opens opportunities for further studies, particularly considering the fact that industry sectors now have become more dominating sector in the economy of the country.

- The study has reached to a general conclusion that SCM dimensions are still in its infancy in Saudi Arabia SMEs manufacturing sector. Even though, they have recognized its importance, implementation of these dimensions is still lagging in their business strategies.

The researcher by reaching on the above conclusions, it can claimed that the first two objectives mentioned in the first chapter as well as on the top of this chapter has been fulfilled.

The framework model (Chapter 6) discussed in this research work was developed based on an extensive literature review of supply chain management and sound academic underpinning (Chapter 2). It was also based on key findings derived from a systematic analysis of quantitative data (Chapter 3). The framework model represents the in-depth thinking and review of different supply chain concepts, theories and models. It also reflects the practical experience of the researcher into the SMEs industry. As such, it would prove highly relevant and useful for establishing a success supply chain system for SMEs industries. The framework model identified four main components of supply chain house system, essential for successful implementation of supply chain practice and for increasing the effectiveness and efficiency of an organization.

The framework was validated qualitatively using the focus group methodology in a selected SME manufacturing company. This framework model accompanied with theoretical and practical assessment in order to provide the management with an aiding tool for proper implementation. The assessment is meant to highlight an organization's present strengths and weaknesses. The framework model was validated for SMEs manufacturing industry; however, it applies to many different kinds and size of organizations. It was developed to assist the organization to close the gap in their supply chain practice implementation, and guide the companies to benchmark their system against the best practice on a journey to become a world

class organization. The framework model can serve as a prototype for evaluating the supply chain maturity and for guiding the firms in for proper system implementing. Such a framework model contributes positively to the Saudi Arabia SMEs, particularly with the absence of any testable implementation framework model. These benefits included improvement the process, increased market business share and improved client satisfaction, all of which are important for sustaining a competitive advantage.

Focus groups are valuable research tools and can capture deeper information that will help to better understand the subject under investigation. The analysis of qualitative data collected during the interview, raised up numbers of recommendations and suggestions to the framework model and to the implementation challenges.

The focus groups complemented the visited site during the facilitation of the study, it represented opportunities to gain deeper information about the company, its operation and its relation with their suppliers and customers, and the visit provided opportunities to learn more about the implementation challenges associated with the capacity of SMEs.

Implementation of this framework model can be can be classified into many types based on many factors that are people, culture, history, goals, structure, products, services, technologies, processes, and operating environments. As a result, the framework model can be developed based on their uniqueness to excellence. The most key thing is to focus on practical implementation. Then it is possible for them to measure, compare with benchmarks and start all over again. In simple, the implementation of SCM is a never-ending process.

This framework model provides a solid foundation for future research and adds to the available literature. An empirical research that considers adding value to the subject area and it can be further improved by studying using the multivariate analysis to test, validation and enhancement.

The development of this framework model fulfills the third objective mentioned in the first chapter as well as on the top of this chapter. Thus, the aim and objectives of this thesis have been completely achieved.

7-2 Contributions and Implications

The thesis makes several contributions that have important implications for both researchers and managers. These contributions should enhance our understanding of the subject under research. Remenyi et. al., (1998) suggests that "a contribution to the body of knowledge should include one or more of the following: extending our ability to understand phenomena, new ways of applying existing science or theories, rejecting invalid theories, and providing unifying explanations for events and circumstances." The following section discusses the main theoretical and managerial implications that result from this thesis are addressed here.

7-2.1 Contribution to Research

The research conducted in this thesis contributes to the body of knowledge in a number of areas. First, this thesis has extended the supply chain literature by building knowledge of SMEs supply chain practices of certain geographical area. The results of this the empirical investigation have strengthened our understanding of the current state of SCM practices of Saudi Arabian SMEs. It demonstrated, empirically, that there were number of weak areas which give an opportunity for improvement.

The second contribution of this study is the methodological approach employed herein. The researcher used multiple research approaches in order to develop a holistic understanding of the problem under investigation. It is only with multiple perspectives that true picture of a problem could be visualized and understood.

Further contribution to theory is the development of Supply Chain House Framework Model that claimed suite and improve the supply chain system of SMEs manufacturing industry. The framework model was developed based on the literature review in the field, the survey result and the researcher experience. The framework model in addition to the basic components of SC, it gave focus to the supply chain risk management, management commitment and continuous improvement. It can be used by researchers and practitioners alike for difference industrial sectors.

It was validated and tested theoretical and practically in SME company. The result of successful implementation of the proposed framework model provides opportunities for the improvement of SMEs supply chain system and in their relation with the suppliers and customers.

7-2.2 Managerial Contribution

The results of this research have important managerial implications as Saudi Arabian SMEs manufacturing industry faces a more competitive environment. First, low profits, combined with increasing competition worldwide, place SMEs organizations at a distinct disadvantage. Many SMEs are experiencing low return which, when combined with limited financial resources, make further investment in expensive business development difficult.

The results of this study could be of interest to practitioners, managers, or policy makers. It gave some important guidelines concerning the importance of SCM practice to SMEs. This study has provided hand on valid and reliable constructs and dimensions that can be used in any industry or business sector of SMEs. The empirical investigation has resulted in highlighting the strength and weakness of the current state of SMEs. The managers benefit from this study by focusing on the weak areas and plan for improvements.

Additionally, validation and assessment procedure was provided to practitioners who wish to assess their SC system toward improvement of their own processes and with their business partners.

Executives who wish to improve efficiency of their supply chain are challenged to implement meaningful SC model that can positively affect the organization's performance. This study demonstrates that the implementation of SCMH may be an opportunity to improve efficiency in their institutions and increase profitability.

Using the framework model assessment procedure will provide hand on tool for the manger to consider benchmarking the firm's business processes against their competitors or others in related industries, and identifying industry best practices. Benchmarking involves comparing the efficiency and effectiveness of a firm's business processes against strict standards and then

measuring performance against those standards. Accordingly, the focal company can achieve competitive advantage by attaining operational excellence, lowering costs, improving profit margins and forging a closer relationship with customers and suppliers.

The framework model has highlighted an important issue to practitioners, managers, or policy makers. They can also benefit from the conceptualization by focusing on the risk associated with their business context supported with high level of commitment. Continuous improvement also should have considerable efforts to keep the model dynamic.

Supply chain risks have a significant role in the business transactions. It can be assumed that the performance of a supply chain will be affected negatively overseen risks. Based on a larger sample, Hendricks and Singhal (2003, 2005) underscore the relevance of supply chain disruptions by showing empirically that these events have a significant negative impact on shareholder value (Singhal, 2003, 2005a) and on operating performance (i.e., sales, operating income, return on assets) (Singhal, 2005b), it can be concluded from their research that capital markets severely penalize supply chain disruptions and attach high value.

The importance of top management commitment is well documented in the literatures (Sakibara, 1994; Shroeder, 1989; Ahire, 1996). The top management should commit them themselves to the development of the entire supply chain and should encourage participation, learning, innovation and creativity by all supply chain members. The top management should also commit themselves to maintaining and sustaining the relationship among the supply chain partners. The cultivation of an organization culture for the whole chain and the forming of cooperative and congruent goals among supply chain members are important tasks of the top management of each member in a supply chain.

Supply Chain Continuous Improvement (SCCI) initiative emphasizes the creation of teams of suppliers, manufacturers and retail customers who share information to improve the performance and effectiveness of the whole chain. SCCI enables the various links of the entire supply chain to work together in response to changing consumer needs and trends. The SCCI initiative can be applied to a supply chain orientation that is either a "pull" or a "push" system or a combination of both.

7-3 Limitation

While the current research made significant contributions from both a theoretical and practical point of view, it also has some limitations, which need to be acknowledged.

The study is limited in a number of ways.

- To start with, the sample is limited with respect to size, choice for SMEs and the limited geographical area. A caution should, therefore, be exercised when interpreting the results.

- Another limitation is that the researcher only considered the influence of limited number of supply chain practices, which we believed from the literature review, have major influence in the supply chain performance.

- In addition, this study considered the manufacturing industry is homogenous in itself, and hence no comparison has been made between different product categories.

- The geographical coverage: the study was constrained to Saudi Arabia manufacturing sector; therefore, the conclusions drawn from this might be country-specific and have a potential problem on generalizability.

- The source of the sampling frame: the organizations' contact detail were obtained from the electronic database of the second industrial city authority. This database list is incomplete, as some records have not been updated for some time, i.e., recent addresses change.

- Research dimensions: the research relied on basic measuring dimensions of supply chain practices which could consider a source of inaccuracy to the study results.

- Time constraint: the time constraint played an important role in the quality of data and depth of the study.

- Single industry cluster: the study has focused on the manufacturing industry, and has not examined supply chains of other sectors. Hence, issues pertinent to manufacturing sector supply chains may not be relevant to other industries.

- Single respondent: the survey questionnaire answered by one of the middle management. Therefore, the use of single respondent may generate some measurement inaccuracy. Thus, the empirical findings from this study should be interpreted with caution.

- Due to time constraints in this study, the number of cases studied were limited. Hence the views and experiences of this SME may not be representative of SMEs in the manufacturing sector.

7-4 Future Studies

- It would be interesting to see future research that adds service-oriented industry and government sectors as well as different geographical area that may benefit from a sound SCM strategy to the study. The extension of this study will help to confirm the importance of supply chain management, accurately identify the challenges and opportunities that SMEs provide and generalize the findings.

- It will be interesting to further study the influence of different soft and hard aspects which have been ignored from this study, which could improve the supply chain performance.

- In addition, this study considered the manufacturing industry is homogenous in itself, and hence no comparison has been made between different product categories. This assumption should be examined in future studies. Furthermore, a comparison study between service organizations and manufacturing companies could provide additional insights.

- It will be more informative if more regions are taken into consideration for better and wider results.

- Instead of concentrating on the electronic database alone if the researcher can gather data from various other sources like manual data collection, data banks etc. coverage will be more wider

- Other related sectors to manufacturing and supply chain also can be included in the area of study to strengthen the research outcome.

- The data from the questionnaire can be collected from a pool of respondents instead of single respondent to avoid bias in the outcome of the same.

- Time constraint to a larger extent can be overcome by planning and scheduling the process well ahead of execution of it; may be through prioritizing events as per their relative importance.

- The framework model described in this research work is only a first attempt at providing a model to improve the supply chain management dimensions of SMEs organization. An expansion of this work can be suggested by examining different dimensions or different industries to benefit the SMEs in their pursuit towards enhancing their business competitiveness and excellence.

- The framework model assessment process described in this study illustrates one methodology by which an organization can assess the applicability of this model. Further assessment methodology can be used for the same purpose.

- Operationalization of the framework model dimensions with relation to competitive advantage can be an area for further study based on qualitative study methodology.

- Further research is needed to establish key elements and disciplines of supply chain continuous improvements in SMEs to the coup with the dynamic nature of the market.

- Finally, it is hoped that this study will provide the momentum for future research aimed at developing or refining the supply chain house dimensions to provide better business performance, and as such, SMEs can survive and compete.

7-4 Summary

This chapter has summarized the findings of the research, outlined its limitations and highlighted the future studies opportunities to the subject area. The following conclusions evidence the achievement of the objectives of the study as indicated earlier:

- Manufacturing strategy was given considerable thrust among the supply chain best practices and in Saudi Arabia SMEs performance measurement is more about the financial performance overlooking the importance of operational performance. Therefore, we can conclude that SCM dimensions are still in its infancy in Saudi Arabia SMEs manufacturing sector.
- Most of the companies investigated failed to comply with basic requirements of logistic dimensions which will jeopardize the supply chain performance of this industry and the study found that most of the respondent companies were not motivated to have advanced supply chain initiatives. Partially, may go to the investments and skills needed and other may go for the awareness on the benefits of such initiatives.
- The framework model would prove highly relevant and useful for establishing a success supply chain system for SMEs industries. The framework model is hoped to be a

good contribution of the author to help and support the business community of SME's in Saudi Arabia for improving the performance of their supply chain system.

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Appendix A

SUPPLY CHAIN DIMENSIONS SURVEY QUESTIONNAIRE

1. Please tick (√) the number of the employees in your company?

1. 20 employees or less
2. 21 to 100 employees
3. 101 to 200 employees
4. 201 to 500 employees

2- Please tick (√) <u>ONLY ONE</u> the position of your company in the supply chain

Raw material supplier
Component supplier
Assembler
Finished Product

3. **Please tick (√) <u>ONLY ONE</u> , the <u>BEST</u> describe the industry of you company?**

Food and Beverage		Paper and Related product	
Rubber Products		Plastics	
Electrical Machinery		Building Materials	
Construction Materials		Chemicals	
clothing Textiles		Petroleum and	
Metal Products		Petro-chemicals	
Furniture		others	

ANUFACTURING STRATEGY

How important are the following manufacturing tegies in your organization?

ery unimportant (2) Unimportant (3)) Neutral (4) Important ery important

l Quality Practices	1 2 3 4 5
Cost	1 2 3 4 5
3 Delivery	1 2 3 4 5

How important are each of the following quality ctices to your firm?

ery unimportant (2) Unimportant (3)) Neutral (4) Important ery important

l Quality Approach	1 2 3 4 5
2 Implementation of TQM	1 2 3 4 5
3 Continuous improvement tools	1 2 3 4 5
4 Benchmark	1 2 3 4 5
5 Quality awareness	1 2 3 4 5

Please tick (√) the number that accurately reflects r organization present practice in lowering total ply chain cost.

Strongly disagree (2) Disagree (3) Neutral (4) Agree Strongly Agree

.1 Sourcing Cost	1 2 3 4 5
.2 Manufacturing Cost	1 2 3 4 5
.3 Sales and distribution cost	1 2 3 4 5
.4 Returns and after sales cost	1 2 3 4 5

1.4 How important are the following delivery practices to your organization?

(1) Very unimportant (2) Unimportant (3)) Neutral (4) Important(5) Very important

1.4.1 Delivery the kind of products needed	1 2 3 4 5
1.4.2 Delivery customer order on time	1 2 3 4 5
1.4.3 Provide dependable delivery	1 2 3 4 5
1.4.4 Implement shipment tracking	1 2 3 4 5
1.4.5 Short order-to delivery time	1 2 3 4 5

2. SUPPLIER PARTNERSHIP STRATEGY

2.1 How important are the following supplier partnership strategies to your organization?

(1) Very unimportant (2) Unimportant (3)) Neutral (4) Important (5) Very important

2.1.1 Supplier Selection Practice	1 2 3 4 5
2.1.2 Supplier involvement practice	1 2 3 4 5
2.1.3 Supply base reduction	1 2 3 4 5

2.2 Please tick (√) the number that accurately reflects your organization present practice in selecting your business partner supplier.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

2.2.1 Trustworthy	1 2 3 4 5
2.2.2 Quality product	1 2 3 4 5
2.2.3 Delivery lead time	1 2 3 4 5
2.2.4 Competitive price	1 2 3 4 5
2.2.5 Technical competence	1 2 3 4 5

Iow important are the following supplier lvement techniques to your organization?
trongly disagree (2) Disagree (3) Neutral (4) Agree
trongly Agree

1 Product design and development Stage | 1 | 2 | 3 | 4 | 5 |

Continuous improvement Programs | 1 | 2 | 3 | 4 | 5 |

Please tick (√) the number that accurately reflects your nization present practice.

trongly disagree (2) Disagree (3) Neutral (4) Agree
Strongly Agree

1 We rely on a small number of igh quality suppliers | 1 | 2 | 3 | 4 | 5 |

2 We get multiple price quotes from suppliers before ordering | 1 | 2 | 3 | 4 | 5 |

3 We drop suppliers for price reasons | 1 | 2 | 3 | 4 | 5 |

.4 We drop suppliers for quality Reasons | 1 | 2 | 3 | 4 | 5 |

CUSTOMER RELATION

How important are the following supplier partnership ategies to your organization?

Very unimportant (2) Unimportant (3)) Neutral (4) Important
Very important

.1 Customer Relation Practices | 1 | 2 | 3 | 4 | 5 |

.2 Customer-Supplier Relationships | 1 | 2 | 3 | 4 | 5 |

Please tick (√) the number that accurately reflects your firms' present conditions

Strongly disagree (2) Disagree (3) Neutral (4) Agree
Strongly Agree

.1 Set reliability, responsiveness, nd other business ethics standards jointly | 1 | 2 | 3 | 4 | 5 |

.2Measure and evaluate customer Satisfaction | 1 | 2 | 3 | 4 | 5 |

3.2.3 Determine future customer expectations | 1 | 2 | 3 | 4 | 5 |

3.2.4 Have joint venture improvement program | 1 | 2 | 3 | 4 | 5 |

3.3 Please tick (√) the number that accurately reflects your firms' present conditions.
(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree
(5) Strongly Agree

3.3.1 Conveying accurate information | 1 | 2 | 3 | 4 | 5 |

3.3.2 Developing and maintaining a positive relationship | 1 | 2 | 3 | 4 | 5 |

3.3.3 Using compatible technologies | 1 | 2 | 3 | 4 | 5 |

3.3.4 Opening lines of communication and engaging in cross-function discussion | 1 | 2 | 3 | 4 | 5 |

3.3.5 Engaging in problem solving and managing conflicts | 1 | 2 | 3 | 4 | 5 |

4. INFORMATION IN SUPPLY CHAIN

4.1 How important are the information startegies to your organization?
(1) Very unimportant (2) Unimportant (3)) Neutral (4) Important
(5) Very important

4.1.1 Information Quality | 1 | 2 | 3 | 4 | 5 |

4.1.2 Information Sharing | 1 | 2 | 3 | 4 | 5 |

4.2 Please tick (√) the number that accurately reflects your organization present practice

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree
(5) Strongly Agree

4.2.1 Information exchange between supply chain partners is timely. | 1 | 2 | 3 | 4 | 5 |

4.2.2 Information exchange between supply chain partners is accurate. | 1 | 2 | 3 | 4 | 5 |

4.2.3 Information exchange between supply chain partners is complete. | 1 | 2 | 3 | 4 | 5 |

4.2.4 Information exchange between supply chain partners is adequate. | 1 | 2 | 3 | 4 | 5 |

4.2.5Information exchange between our trading partners and us is reliable. | 1 | 2 | 3 | 4 | 5 |

lease tick (√) the number that accurately reflects your ization present practice.

rongly disagree (2) Disagree (3) Neutral (4) Agree rongly Agree

We inform trading partners in ance of changing needs	1	2	3	4	5
Our trading partners share prietary information with us	1	2	3	4	5
Our trading partners share siness knowledge of core business process with us	1	2	3	4	5
We and our trading partners hange information that helps establishment of siness planning	1	2	3	4	5
We and our trading partners keep h other informed about events or changes that may ect the other partners	1	2	3	4	5

lease tick (√) the number that accurately reflects your ization present practice.

ongly disagree (2) Disagree (3) Neutral (4) Agree rongly Agree

Schedule and planning	1	2	3	4	5
Production data	1	2	3	4	5
Order quantities	1	2	3	4	5
Inventory Status	1	2	3	4	5

lease tick (√) ALL IT application (s) used in your ess interactions with your suppliers.

Phone	☐	4.5.2 Fax	☐	4.5.3 E-mail	☐
EDI	☐	4.5.5 Intranet	☐	4.5.6 Extranet	☐
MRP	☐	4.5.8 MRPII	☐	4.5.9 ERP	☐
arCode	☐	4.5.11E Commerce	☐	4.5.12 CAD	☐
Engineering data management					☐
Manufacturing execution system					☐
Computer-aided process planning					☐

5. LOGISTIC INTEGRATION

5.1 Please tick (√) the number that accurately reflects your organization present practice.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

5.1.1 Inter-organizational logistic activities are closely coordinated	1	2	3	4	5
5.1.2 Information and materials flow smoothly between our supplier firms and us	1	2	3	4	5
5.1.3The inbound and outbound distribution of goods with our suppliers is integrated	1	2	3	4	5

6. THE CURRENT AND FUTURE SCM INITIATIVES

6.1 Please tick (√) the number that accurately reflects your organization present practice.

(1) Not likely (2) Maybe (3) Planned (4) In place

6.1.1 Greater use of technology	1	2	3	4
6.1.2 Internet link to suppliers	1	2	3	4
6.1.3 E-Business	1	2	3	4
6.1.4 Bar Coding	1	2	3	4
6.1.5 EDI	1	2	3	4

7 PERFORMANCE MEASURE

7.1 How important are the following performance measures to your organization?

(1) Very unimportant (2) Unimportant (3)) Neutral (4) Important (5) Very important

7.1.1 Financial Performance	1	2	3	4	5
7.1.2 Operational Performance	1	2	3	4	5

7.2 Please tick (√) the number that accurately best indicates your organization financial performance.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree

7.2.1 growth in sales	1	2	3	4	5
7.2.2 growth on assets	1	2	3	4	5
7.2.3 market share gain	1	2	3	4	5

Return on investment	1	2	3	4	5
5 Profit margin on sales	1	2	3	4	5

Please tick (√) the number that accurately best cates your organization operational performance.

Strongly disagree (2) Disagree (3) Neutral (4) Agree Strongly Agree

1 Volume Flexibility	1	2	3	4	5
2 Scheduling Flexibility	1	2	3	4	5
3Delivery reliability & consistency	1	2	3	4	5
4 Product quality	1	2	3	4	5
5 Customer satisfaction index	1	2	3	4	5

pondent Information:

your need a copy of the questionnaire results? **Yes** ☐ **No.** ☐

e:_____

pany Name:_____

ress:_____

_____ **Fax:**_____

ail:_____

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APPENDIX B
INTRODUCTION LETTER

Dear Sir:

I am a PhD research student at Sheffield Hallam University, United Kingdom, completing my Doctorate of Philosophy in Business Excellence. I am currently doing a research study on the **Supply Chain Practices of Small and Medium Enterprises**. My study is supervised by Professor Kadim AL-Shaghana, the professor of Business Excellency.

This research will attempt to understand the different supply chain practices employed in the selected SMEs manufacturing companies, and then benchmark them against world class SMEs.

I greatly appreciate your participation in this research by answering this carefully designed questionnaire in complete, as incomplete surveys may lead to poor analysis. If you feel there is someone else in your organization that would be better able to complete this survey, please forward this survey to him with great thanks. Responding to this questionnaire is estimated to take no longer than 20 - 25 minutes to complete. We would like to assure you that the information you provide will be kept in strict confidence.

When you have completed the questionnaire, please return it to us using the self-addressed stamped envelope as soon as possible. If you would like a copy of the final report of this study, please let us know.

We are looking forward to your prompt response and, thank you for your helping to make this study a success. **And If you do need help in completing this, do not hesitate to contact the undersigned.**

Sincerely yours,

Mosa S. Al-Haddad