CHAPTER 1: INTRODUCTION

1.1 Supply Chain Management
The field of supply chain management from industry perspective is approximately 25 years old. As per Chen & Paulraj (2004), many fields have inspired supply chain concept which includes:

- revolution in quality management field
- concepts of materials and logistics management
- a growing interest in industrial markets and networks
- organizations focusing on core competence, and
- valid and specific studies which had played an influential role in industry practices.

The typical functions which comprise of supply chain management include, forecasting, procurement, production, transportation, warehousing & dispatch. These functions are in existence since the inception of business entities in some form or the other. So its natural to wonder why then suddenly supply chain management has come in to limelight especially in the past decade or so?

There are many reasons for this like:

- Less number of organizations still remaining vertically integrated
- Organizations becoming more and more specialized as they concentrate on their core competencies
- Rise of integrated service providers like logistics companies capable of taking care of non-core activities for manufacturing / retail organizations
- Revolution in information technology assisting in providing end to end connectivity and visibility
- Increasing global competition offering more choices to customers
- Spread of internet helping customers becoming more aware and demanding about products and services

Womack & Jones (1996) argue that such external forces have ushered in an era of continuous changes within organizations. They have also impacted the entire organizations in way of rapid technological changes to a much shorter product life cycle. This view is
further expanded by Gunasekaran et al. (2004) when they state “the growth and development of supply chain management (SCM) is not driven only by internal motives, but by a number of external factors such as increasing globalization, reduced barriers to international trade, improvements in information availability, and environmental concerns”. Mentzer et al. (2001) have summed up this changed attitude of decision makers towards supply chain management stating that “strategic decision-makers within an organization have recognized the importance of supply chain management recently due to influential factors such as globalization, pressures on time, quality expectations, and marketplace uncertainty”. Today’s manufacturing organizations operate in a highly competitive environment which is not only global in nature but is also full of increasingly demanding customers (Rich & Hines, 1997). Further, companies are cutting excess flab by streamlining all operations and improving responsiveness by reducing the time-to-customer for their products. These reasons are compelling organizations to critically re-examine and manage their supply chains. (Lummus, R.R. & Vokurka, R.J. 1999). According to Sundaram & Mehta (2002). Much of today’s fierce competition can be attributed to economic globalization for past two decades, which has enabled organizations to operate in a boundary-less world. Thus clearly suggesting role of agencies / companies outside the organizations to help provide the competitive advantage. Over the period of past two decades or so organizational attention thus has changed from inward to outward. Further, Womack and Jones (1996) argue that since the late 1990s, there is a substantial increase in change and uncertainty surrounding manufacturing organizations and their supply chains. LaLonde, B.J. & Masters J.M. (1994) state that “as business evolves into the twenty first century, the predominant management focus driving many organizations is supply chain management”. In addition, the revolution in information technologies in general and internet / web in particular has thrown open unlimited opportunities for organizations to change the way they operated their supply chains. Cox (1999) proposes that both e-commerce and e-business have unleashed an information processing revolution. This revolution has impacted the intermediaries and has also provided easy linkages to the end customer as well as between all stages of supply chain. Thus there is tremendous scope to transform the existing supply chains. He further adds that, it’s no wonder that therefore, the functional managers belonging to varied branches of business practice – from
procurement, operations, through logistics management have started focusing on the issues pertaining to supply chain management. With this realization, organizations have also started to view their supply chains as key differentiators. In fact, in recent decades, companies from diverse sectors such as automotive, high tech, retail and consumer packaged goods, all have understood that supply chain has a much bigger role to play than merely controlling the cost of delivering products to customers (Glatzel et al. 2014). Marchese, K. & Lam, B. (2014) of Deloitte Consulting LLP, feel that in order to succeed the next wave of globalization, organizations must embrace the anticipatory supply chain management practices, thus clearly highlighting the future of supply chain management.

Much before industry realized importance of supply chain as a competitive weapon, military establishments all over the world have been practicing principles of supply chain management for centuries. In fact the origins of logistics which is an integral part of supply chain can be found in military warfare. Wiles, M. & Chinn D. (2010) opine that, the idea that “logistics are fundamental to the generation and maintenance of fighting power in every environment” is not new—it has been true in all major combat from Alexander’s Macedonian army until today. They also cite UK forces demanding deployment to Iraq in 2003 which was a crucial maneuver in supply chain management and which sort of didn’t meet the expectations at that time.

1.2 Supply Chain Performance
Supply chain encompasses a complex set of activities which run across various functions within an organization as well as run through various organizations which are part of that supply chain. Thus, it is possible to measure supply chain performance at various nodes within the chain or network. Rightly so, supply chain performance can be measured across the organization. Lai, K.-H. et al. (2004) state that, today the firms have a challenge to achieve competitive edge in terms of cost and service differentiation and this can be done through effectively managing their supply chain performance.

As opined by Lambert et al. (2001), a well-crafted system of supply chain metrics, by ensuring process alignment across supply chain entities can:
• Increase the chances for organizational success by addressing the needs of the most profitable market segments, and
• Thereby help organization obtain a competitive advantage.

Lapide (2000) while arguing about financial accounting measures, states that financial measures are important and in a way they translate improvements made through operational changes into the financial health of an enterprise, but they alone are not adequate enough to measure supply chain performance. He further cites following reasons for the same:

• Financial accounting measures are based on historical data and hence do not provide forward looking perspective
• Many important strategic, performance measures, like customer satisfaction, service level, product quality etc. are non-financial in nature. Only financial accounting measures are inadequate to capture the same
• It’s not always easy to link financial measures directly to operational effectiveness and efficiency

Researchers have proposed various frameworks, measures, indicators, metrics to measure supply chain performance. Elrod et al. (2013) after extensive literature review have grouped supply chain performance measures by 1) financial costs, 2) quality 3) time and 4) flexibility. Gunasekaran et al. (2001) have considered four phases of supply chain systems viz. plan, source, make and deliver, with an objective of developing relevant performance measures and metrics. Gunasekaran et al. (2004) through literature review and empirical analysis have developed a supply chain performance metrics framework which further develops this idea, considering the organization need at various management levels (strategic, tactical & operational). In order to overcome the deficiencies posed by traditional accounting methods while measuring supply chain performance, researchers and professionals have developed a variety of measurement approaches.

Lapide, L. (2000) proposes following:

• The Balanced Scorecard (BSC)
• The Supply Chain Council’s Supply Chain Operations Reference (SCOR) Model
• The Logistics Scoreboard
• Activity-Based Costing (ABC)
• Economic Value Analysis (EVA)

Sillanpaa, I. & Kess, P. (2012) after a rigorous literature review of supply chain performance measurement in manufacturing domain, have come up with three principal approaches for supply chain performance measurement:
• Management approach
• Time based approach
• Quantitative and qualitative measures

Further, typically these approaches are either hierarchical or process centric in nature. Across all these frameworks one common thread is, almost all of them are predominantly focused on the apparently tangible or quantifiable measures which are the outcomes of managerial decisions. Many researchers have also attempted empirical studies to measure supply chain performance. Majority of these studies have been done in non – Indian context and to be very specific either in US or Europe or lately in Chinese context. Most of these studies have used supply chain practices or supply chain strategies as predominant themes for measuring supply chain performance. Past research of supply chain literature also reveals performance measurement frameworks. However, the human behavioral aspect (skills, values), organizational cultural aspect, and leadership style aspect which are so crucial to any decision and which impacts the actual performance are rarely considered in these frameworks. Same can be said about organization structure especially in terms of supply chain structure which rarely showcases in past studies focusing on supply chain performance. Notable exceptions to this is SCOR¹ model which takes into account the people skills and competency aspect.

“The SCOR skills framework provides a global view of the needs and issues surrounding skills management for supply chain professionals, including the technical skills, aptitude, and experience required to manage an effective supply chain” (Supply chain council 2010). Further, the BSC also has innovation and learning perspective & internal process

perspective both trying to address this issue indirectly. Time and again researchers have validated role of these human factors in actual performance. As argued by Knemeyer et al. (2011), logistics and supply chain systems can also be viewed as networks of interacting human beings. As suggested by Fawcett & Waller (2011), logistics and supply chain systems are inherently social systems where people trust, collaborate and innovate. Considering all these aspects it’s pertinent to include appropriate indicators / metrics which consider these human / softer characteristics of organization while measuring supply chain performance.

1.3 Organizational Performance

For many years, management commentators and practitioners have been trying to ascertain as to how organizations should assess their performance (Kennerly, M. and Neely, A. 2002). While describing the limitations of traditional organizational performance management systems, Srinivas, S (2009) opines that most of the organizations do not have a clear view of current reality. He cites a few reasons for the same as listed below:

- Typically, majority of the organizations suffer from financial short sightedness. Organizations have a number of initiatives to address this issue however very few are able to demonstrate effective use of such approaches.
- A financial reporting system that provides a misleading picture of current reality
- A reward system (tied up with financial system) that may drive managers to portray a rosier picture

He further emphasizes that while financial results are important, it’s often the result of few drivers. The three key possible drivers are:

a. Market Leadership
b. Productivity &
   c. Solution Leadership (Customers are looking for solutions to their problems and organizations need to look at unique ways to provide better solution)

Long back, Eccles, R. (1991), while commenting on the revolution taking place in business performance measurement had opined that, many senior executives have taken this drastic decision to shift from performance measurement based on only financial figures to
financial measures as one among a broader set of measures. In line with this thought process, Kaplan, R.S. & Norton, D.P. (1992), proposed the balanced scorecard, a comprehensive framework that translates an organization’s strategic objectives into performance measures. It provides four different perspectives for measuring organizational performance. So along with traditional financial perspective, the framework provides customer perspective, internal process perspective and innovation & learning perspective for measurement of business performance. Thus it tries to balance out the weightage of financial performance measures with the non-financial performance measures.

Over the years various other alternatives of organizational performance measurement emerged and organizations also realized that mere measuring financial performance does not denote total performance. Through total quality management (TQM) philosophy, performance measurement systems like, Deming Prize, Malcolm Baldrige National Quality Award (MBNQA) and European Foundation for Quality Management Excellence Model (EFQM)\(^2\) provided means of organizational performance measurement. All these frameworks / systems helped practicing managers, measure performance of their organizations in a holistic way. However, among all these frameworks, balanced scorecard remains to be the most popular one. As per the estimate, majority of the organizations in India use balanced scorecard in some form or the other as a tool to measure their performance.

1.4 Pune Industrial Belt

Pune often known as ‘Oxford of the East’ or ‘Culture Capital of Maharashtra’ has emerged as one of the fastest growing industrial hub in India over the span of last 40 years or so. In recent years the city has transformed itself into one of the upcoming metros in the country. Due to presence of many of world’s topmost automobile manufacturers’ facilities and clustering of auto ancillaries units, Pune is also known as ‘Detroit of the East’.

Post India’s economic reforms, the city has gained much preference from a wide variety of industries who have set up their bases in and around Pune. The most notable of these

\(^2\) EFQM is a not-for-profit membership foundation in Brussels, established in 1989 to increase the competitiveness of the European economy
industries are Information Technology, Engineering, Projects along with Automobile. The
city is also an education hub, housing many reputed engineering and management
institutes. From industry perspective, Pune offers many advantages. One of the most
important being the city’s proximity to Mumbai, financial capital of India and excellent
connectivity it has with Mumbai. This offers a major advantage especially to
manufacturing & automobile sector as proximity to Ports (Mumbai) enables ease of
imports & exports. Being the second largest city in Maharashtra, it has recently surpassed
Bangalore to become a hub for the engineering industry. Further, Pune also represents one
of the single largest hub for German companies who are known for their engineering &
manufacturing know how.

Pune’s growth as an industrial hub started long back in 1950 – 1960s. Companies like
Kirloskar Oil Engines, Tata Motors (Telco at that time), Bajaj Auto, Finolex Cables, Force
Motors (Bajaj Tempo at that time) were a few of the Indian companies who started this
industrialization. Over a period of time many multinational companies like Forbes
Marshall, Sandvik Asia, Atlas Copco, Greaves Cotton etc. opened their facilities here. This
also helped develop a cluster of suppliers in and around Pune, who met requirements of
these big companies by supplying them the needed inputs. The most notable of such
clusters is cluster of auto ancillary units. Post economic liberalization, many of world’s top
auto manufacturers came to India and established their manufacturing base in Pune.
Notable among them are Mercedes Benz AG., General Motors, FIAT Auto, Volkswagen
AG., Piaggio etc. They were also joined by Indian auto manufacturers like Mahindra &
Mahindra starting its largest plant at Chakan near Pune. While the existing auto
manufacturers of Pune like Bajaj Auto & Tata Motors expanded their capacities. The influx
of top automobile companies in Pune also resulted in their foreign suppliers setting up their
facilities in Pune. Many of these suppliers entered into joint ventures with Indian suppliers
and thus forming a very large auto ancillary cluster in Pune industrial belt. These
companies include Apollo Tyres, Bharat Forge, Minda Group, Atul Group, Varroc Group,
Endurance Group and so on.

That does not mean that the industrial growth of Pune was restricted to automobile sector alone. Pune also became manufacturing base for many manufacturing/engineering giants like GE, Eaton, John Deere, DSM, and Cummins. These companies brought with them their world class business processes & practices which helped their local suppliers (mostly from Pune) upgrade themselves. Many Indian groups chose Pune as their manufacturing base. A few of them are, Kirloskar Group, Godrej Group, Garware Group, Poonawala Group, Finoles Group & Vedanta Group.

Consumer durable giants like LG, Whirlpool, Haeir, Racold, Godrej have their manufacturing facilities in Pune. Similarly electric/electronic component manufacturers like Vishay Components, Schneider Electrics, Finoles J Power systems have their manufacturing presence in Pune. Further process industry companies including chemicals/pharmaceutical companies like Asian Paints, Emcure Pharma, Serum Institute have their manufacturing plants in Pune. Construction Equipment Manufacturers like Sany (Chinese), Hyundai (S.Korean) along with World class elevator manufacturers like Kone (Finnish) & Schindler (Swiss) have manufacturing presence in Pune. Project based companies like Thermax, Praj Industries, Suzlon, ThyssenKrupp Industries also have their manufacturing base in Pune. In addition, multinational giants in food & beverage business like Pepsi, Coca Cola, Mondelez (Formerly Cadbury’s) have manufacturing plants in Pune. Equipment manufacturers like Alfa Laval (dairy), Rieter (textile), Sulzer (Machinery) have their bases in Pune.

Thus Pune industrial belt covers a wide array of industry sectors under manufacturing. It also provides a good blend of both domestic as well as foreign companies. Majority of these companies cater both i.e. domestic (Indian market) as well as export market. Being actively engaged in manufacturing, these companies source their inputs not only locally (across India) but also from global sources. All these factors aid in having a representative mixture of manufacturing companies not only in terms of their scope of activities but also in terms of their supply chains in general and supply chain management practices in particular. For the purpose of this research, Pune industrial belt is considered to be consisting of following,
- M.I.D.C. Pimpri Chinchwad
- M.I.D.C. Bhosari
- M.I.D.C. Chakan
- M.I.D.C. Talegaon
- M.I.D.C. Shirwal
- M.I.D.C. Ranjangaon
- M.I.D.C. Pirangut
- M.I.D.C. Jejuri
- M.I.D.C. Baramati
- M.I.D.C. Kondhapuri

In addition to above there are many small M.I.D.C. located nearby Pune but are not explicitly listed, also form part of Pune’s industrial belt. Thus by far within India, Pune industrial belt offers this wide array of manufacturing industries prominent amongst which are:

- Automobile
- Auto – ancillaries
- Consumer Durables
- Electronics
- Engineering
- Process
- Projects

The major industries not forming part of Pune industrial belt are Cement, Petroleum & Textiles. Considering the fact that both cement as well as petroleum industries have strong sourcing related factors associated with their location (availability & proximity of raw material commodities), Pune industrial belt provides a very good representation of manufacturing industry in India.

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4 Maharashtra Industrial Development Corporation. A state government regulatory body specifically established to provide infrastructural facilities to industries.
Over the period of last twenty years or so have seen evolution in the field of operations management which resulted in a new field namely supply chain management. While focus of operations management activities per say has always been inwards (within the organization), the focus of supply chain activities is essentially outwards. Over the years many management tools / techniques / practices / philosophies have evolved from operations management. Notable amongst them are:

- Lean manufacturing primarily from Automobile & Engineering industries
- Keiretsu / JIT / Supplier clusters etc. from Automobile / Auto ancillary industries
- Sub - contracting / outsourcing from Project industries
- Various techniques for demand management from consumer durables & automobile industries

All these tools / techniques have a major role to play in supply chain management. Thus, from supply chain management practices perspective also Pune industrial belt provides a good representation of industries.

The study primarily intends to address the gap of lack of softer aspects in performance measures and tries to propose an approach / framework for supply chain performance measurement which takes into account all these aspects. For the purpose of this study, the researcher has considered Mckinsey’s 7 – S framework as a basis. The reason for choosing this framework was threefold, at the outset supply chain by nature is an organization in itself. Secondly, the 7 – S framework provides a near perfect blend of both soft as well as hard aspects of an organizational performance measures and last but most important, as argued by Kaplan, R.S. (2005), 7 – S model and balanced scorecard share many features. They both articulate that organizational success requires a multidimensional approach. The other aspect of this research, is to empirically test relationship between supply chain performance and organizational performance in the context of Indian manufacturing industry.

Further, scope of this study is restricted to Pune Industrial Belt. The Pune industrial belt provides a representation of all almost all the manufacturing industries in India and thereby aids in making this research include perspectives of varied manufacturing industries and their supply chain practices.