CHAPTER 2

LITERATURE REVIEW AND PROBLEM FORMULATION

2.1 PREAMBLE

As a part of research study extensive literature survey was made and were reviewed critically. Discussion of literature related to the technologies associated with e-business and SC to provide context and a number of key concepts need to be considered are covered in this chapter. Existing gaps have been identified. In addition, this chapter also covers research objective, problem definition and formulation of hypothesis.

2.2 SUPPLY CHAIN MANAGEMENT IN SMEs

2.2.1 Status of SCM in SMEs

In many countries the acronym SME is used, while in India, the acronym MSME is used. In this thesis both SME and MSMEs are used synonymously. Hence the SC is considered as same for both SME and MSME in this thesis.

Morrell and Ezingeard (2002) explored to identify a framework of key variables which influence the adoption of inter-organizational and supply-chain systems with particular reference to smaller companies. This framework was then applied to a supply-chain case study in the chemicals sector to consider the reality of system adoption for a small-to medium-sized enterprise (SME) in the chain. The results showed that significant benefits are indeed attainable for the SME; however, a culturally-rooted lack of vision and
awareness are restricting adoption and the realization of benefits associated with such systems.

Hong and Jeong (2006) made a study to identify the impact of SMEs on supply chain performance. They take the role of suppliers, producers, distributors, and customers. Large firms and SMEs are compared in terms of strategic and operational choices. The theoretical contribution of this research to the nature of SMEs and their supply chain relationships is threefold: the differences between large enterprises and SMEs have been examined in terms of key management practices; key characteristics of four types of SMEs have been identified in terms of their supply chain relationship position, strategic focus; and the transition paths. The models presented in this research provide an insight and understanding of the dynamic changes that can transform SMEs within their supply chain relationships.

Lim et al (2006) conducted an investigation into the selection and evaluation of a suitable strategic positioning methodology for SMEs in Singapore. This research showed a leading integrated strategic planning decision making process, which was found to be potentially suitable for SMEs in Singapore. The process was then applied and evaluated in two industrial case studies and results in the form of strengths, weaknesses and opportunities were evaluated and discussed in detail.

Theoretical study by Thakkar et al (2008) proposed a role interaction model for understanding a supply chain orientation of SMEs. The result of the study examined the differences between large enterprises and SMEs in terms of key supply chain practices. It identified various role players affecting the SCM in SMEs and proposed a model to have realistic evaluation of SMEs supply chain practices. The model offered probable solutions associated with each combination of role players to improve upon weak areas.

Meehan and Muir (2008) studied SCM practice in small to medium-sized enterprises (SMEs) in Merseyside, UK. The results reveal the perceived
benefits of SCM to SMEs, which centres on SCM as a means to improve customer responsiveness. It also expresses concerns over SMEs’ ability to adapt to these new working relationships and therefore gain the desired benefits. Analysis of barriers highlights that they reside at the individual, relational and organizational level, thus increasing the complexity of adapting to SCM.

Thakkar et al (2009) made a review to identify the key areas that influence managing the SC in the SME sector in India. The result of the review showed that, SMEs in India vary in outputs, productivity and organizational characteristics. Since the late 1990s, globalization has forced many organizations in the engineering sector to enter the Indian market. Their low-cost, high-quality products challenged Indian SMEs. The study observed that the need to become competitive is now a matter-of-fact for all SMEs in India.

2.2.2 Importance of SC Performance

Saad and Patel (2006) investigated the relevance of the concept of SC performance in developing countries and also attempted to identify a set of performance measures for supply chain performance in automotive firms in India. The result showed that the concept of supply chain performance was not fully adopted by the Indian automobile sector and also highlighted the difficulties associated with its implementation. Developing nations like India predominantly use financial, productivity-based measures for measuring the SC performance while developed countries use non-financial metrics for measuring and fostering improvement of performance of supply chains through better relationships, more shared learning and commitment to a common purpose. Major advantages of these non-financial measures include flexibility and ability to take into consideration soft aspects linked to empowerment, trust and continuous improvement (Saad and Patel 2006).
An integrated supply chain is one in which the final consumers pull the inventory through the value chain instead of the manufacturer pushing the items to the end users (Tan 2001). Elmuti et al (2008) investigated the impact of integrated supply chain management on productivity, efficiency, and performance of participants in the system in an industrial setting in USA. The results showed positive and substantial improvements in the overall performance, as a result of integration and coordination of the internal functions within the firm, and effectively linking them with their external suppliers. The results also support the claim that an integrated supply chain involves aligning outsourcing activities to achieve the organizational goal of responding positively to the needs of consumers. Several factors were identified as key contributors to supply chain program success in the firm. These include sharing information through new technologies, established partnerships with key suppliers, and constant communication with employees.

Chae (2009) explored to offer a practical approach to performance measurement and to present a list of essential key performance indicators (KPIs). The experience from the review of industry standards and best practices in supply chain performance measurement, suggest that “less is better” as to developing performance metrics. Companies should focus on only a small list of KPIs which are critical for their operations management, customer service, and financial viability. Potential KPIs should be developed for each of the supply chain operations-reference (SCOR) model’s four meta-processes (plan, source, make, and delivery) and need to be hierarchically grouped such as primary and secondary metrics.

Chin et al (2010) examined the relationships among SCM practices and their impacts on firm’s financial and non-financial performance. The results show that external customer-firm-supplier relation management positively impacts firm internal contextual factors, which in turn have positive effects on firm performance. This finding suggests that a successful implementation of SCM not only directly improves operational performance,
but also indirectly enhances customer satisfaction and financial performance. The operational performance metric measures a company’s relative performance with its main competitors on the three competitive priorities of speed, delivery and quality items commonly used to represent the operational excellence of an organization. On the other hand the financial performance is measured using the company’s cost and profit-related aspects compared with its direct competitors (Sengupta et al 2006).

Arawati (2011) analyzed the importance of incorporating SCM in Malaysian manufacturing companies. The result suggests that SCM has significant correlations with supply chain flexibility and business performance. Specifically, supply chain flexibility and business performance have high correlations with SCM comprising programs such as ‘strategic supplier partnership’, ‘lean production’, ‘postponement concept’ and ‘technology and innovation’. In addition, the Structural Equation Model (SEM) result also demonstrates that two supply chain management proxies, specifically ‘new technology and innovation’ and ‘lean production’ appear to be of primary importance and exhibit most significant impact on supply chain flexibility and business performance.

2.2.3 Emphasis on SCM Practices

Li et al (2006) conceptualized and developed five dimensions of SCM practice viz., strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and postponement. Further, they have tested the relationships between SCM practices, competitive advantage, and organizational performance. Data for the study were collected from organizations in USA and the relationships proposed in the framework were tested using structural equation modeling. The results indicate that higher levels of SCM practice can lead to enhanced competitive advantage and improved organizational performance. Also, competitive advantage can have a direct, positive impact on organizational performance.
Sahay et al (2006) explored to assess the current state of supply chain management practices followed by Indian organizations and also identified important areas that need to be addressed in order to increase their competitiveness. The research findings reveal that most of the Indian organizations have aligned their supply chain objectives with their business objectives. They are now on the course of aligning their processes and management focus. Enhanced level of competitiveness would require Indian organizations to manage the three-dimensional alignment of achieving the agenda set by the business strategy.

The study of Tummala et al (2006) covered examination of important operational issues related to strategic success factors that are necessary when implementing SCM plans in an organization. This research was conducted in manufacturing firms of USA. The result of the study showed that not enough resources were allocated to implement and support SCM initiatives in their divisions. In addition, they perceived that resource allocation could be improved in the areas of better information systems, greater commitment, setting clear-cut goals, increased training, more personnel, and aligning SCM initiatives with current priorities and resource commitments.

2.3 GROWTH, PERFORMANCE STATUS AND e-BUSINESS IN MSMEs

2.3.1 Growth and Performance of MSMEs

The office of the Development Commissioner of MSME provide estimates in respect of various performance parameters relating to the Sector. Table 2.1, shows the MSMEs’ performance like investments, production, employment etc. This table was derived from the time series data in respect of MSME Sector on various economic parameters. It is to be noted that data with respect to MSMEs have been collected/compiled for the
first time in 2006-07 and hence include both the industry and service sectors. Till the year 2005-06, data refer only the micro and small scale industry (MSME Annual Report 2011-12).

Table 2.1 MSMEs performance: units, investment, production, employment and exports

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Total MSMEs (numbers in million)</th>
<th>Fixed Investment (in billion)</th>
<th>Production Current Prices (in billion)</th>
<th>Employment of person (in million)</th>
<th>Exports (in billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2001-02</td>
<td>10.521</td>
<td>15434.9</td>
<td>28227.0</td>
<td>24.933</td>
<td>7124.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.07)</td>
<td>(5.11)</td>
<td>(8.03)</td>
<td>(4.44)</td>
<td>(2.07)</td>
</tr>
<tr>
<td>2</td>
<td>2002-03</td>
<td>10.949</td>
<td>16231.7</td>
<td>31485.0</td>
<td>26.021</td>
<td>8601.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.07)</td>
<td>(5.16)</td>
<td>(11.54)</td>
<td>(4.36)</td>
<td>(20.73)</td>
</tr>
<tr>
<td>3</td>
<td>2003-04</td>
<td>11.395</td>
<td>17021.9</td>
<td>36454.7</td>
<td>27.142</td>
<td>9764.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.07)</td>
<td>(4.87)</td>
<td>(15.78)</td>
<td>(4.31)</td>
<td>(13.52)</td>
</tr>
<tr>
<td>4</td>
<td>2004-05</td>
<td>11.859</td>
<td>17869.9</td>
<td>42979.6</td>
<td>28.257</td>
<td>12441.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.07)</td>
<td>(4.98)</td>
<td>(17.90)</td>
<td>(4.11)</td>
<td>(27.42)</td>
</tr>
<tr>
<td>5</td>
<td>2005-06</td>
<td>12.342</td>
<td>18811.3</td>
<td>49784.2</td>
<td>29.491</td>
<td>15024.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.07)</td>
<td>(5.27)</td>
<td>(15.83)</td>
<td>(4.37)</td>
<td>(20.76)</td>
</tr>
<tr>
<td>6</td>
<td>2006-07</td>
<td>26.101</td>
<td>50075.8</td>
<td>70939.8</td>
<td>59.461</td>
<td>18253.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(111.48)</td>
<td>(166.20)</td>
<td>(42.49)</td>
<td>(101.62)</td>
<td>(21.50)</td>
</tr>
<tr>
<td>7**</td>
<td>2007-08</td>
<td>27.279</td>
<td>55819.0</td>
<td>79075.9</td>
<td>62.634</td>
<td>20201.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.51)</td>
<td>(11.47)</td>
<td>(11.47)</td>
<td>(5.34)</td>
<td>(10.67)</td>
</tr>
<tr>
<td>8**</td>
<td>2008-09</td>
<td>28.516</td>
<td>62175.3</td>
<td>88080.5</td>
<td>65.935</td>
<td>N. A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.53)</td>
<td>(11.39)</td>
<td>(11.39)</td>
<td>(5.35)</td>
<td></td>
</tr>
<tr>
<td>9**</td>
<td>2009-10</td>
<td>29.808</td>
<td>69383.5</td>
<td>98291.9</td>
<td>69.538</td>
<td>N. A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.53)</td>
<td>(11.59)</td>
<td>(11.59)</td>
<td>(5.47)</td>
<td></td>
</tr>
<tr>
<td>10**</td>
<td>2010-11</td>
<td>31.152</td>
<td>77348.7</td>
<td>109575.8</td>
<td>73.217</td>
<td>N.A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.51)</td>
<td>(11.48)</td>
<td>(11.48)</td>
<td>(5.29)</td>
<td></td>
</tr>
</tbody>
</table>

**Projected {Source: S&D Division – Office of the DC (MSME)}
The figures in brackets show the percentage growth over the previous year. The data for the period up to 2005-06 cover small scale industries (SSI) only. Subsequent to the period 2005-06, data complied cover micro, small and medium enterprises (MSMEs).

From Table 2.1, it is evident that the employment levels, no of MSMEs, fixed investment and production rate have been increasing year by year. After 2005-06, there is a drastic increase in all values due to the inclusion of micro industries. For the past five years there is a tremendous increase in all factors perhaps due to adoption of various improvement measures.

2.3.2 Comparison of MSMEs Sector with the Overall Industrial Sector

The MSME sector has maintained a higher rate of growth vis-à-vis the overall industrial sector as would be clear from the comparative growth rates of production for both the sectors during last five years, as evident from Table 2.2.

**Table 2.2 Comparative data on growth rates of MSME sector**

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth rates of 2001-02 base IIP (%)</th>
<th>Over all Industrial Growth rates of sector (%) #</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-2003</td>
<td>8.68</td>
<td>5.70</td>
</tr>
<tr>
<td>2003-2004</td>
<td>9.64</td>
<td>7.00</td>
</tr>
<tr>
<td>2004-2005</td>
<td>10.88</td>
<td>8.40</td>
</tr>
<tr>
<td>2005-2006</td>
<td>12.32</td>
<td>8.20</td>
</tr>
<tr>
<td>2006-2007</td>
<td>12.60</td>
<td>11.90</td>
</tr>
<tr>
<td>2007-2008</td>
<td>13.00*</td>
<td>8.70</td>
</tr>
<tr>
<td>2008-2009</td>
<td>Not Available</td>
<td>3.20</td>
</tr>
<tr>
<td>2009-2010</td>
<td>Not Available</td>
<td>10.50</td>
</tr>
<tr>
<td>2010-11</td>
<td>Not Available</td>
<td>7.80</td>
</tr>
</tbody>
</table>

*; Projected, IIP – Index of industrial Product
The total employment provided by the MSE sector in the country, as per the Fourth Census of MSEs with 2006-07 Reference Year, was 594.61 lakh persons numbers. As per the estimates compiled for the year 2009-10, the employment was 695.38 lakh persons in the sector. From table 2.2, it is evident that there is an increase in MSMEs growth rate every year, the overall industry growth rate is varying very much due to the policy changes in the government.

The growth in respect of number of MSMEs, employment, investment and production are shown as bar charts vide Figures 2.1, 2.2, 2.3 and 2.4 respectively.

![No of MSMEs](image)

**Figure 2.1 Number of enterprises in MSMEs sector**
Figure 2.2 Employment in MSMEs sector

Figure 2.3 Fixed investment in MSMEs sector
From the Figures 2.1, 2.2, 2.3 and 2.4, it is evident that the number of MSME, employment, production and fixed investment are growing year after year. The Figure 2.5 shows that the MSMEs have outperformed IIP and
GDP growth rates in the past five years. The total production of MSMEs for FY 2011 was Rs.10,957.6 bn (at 2001-02 prices). Between FY 2007 and FY 2011, the sector’s total production grew at an annual compounded growth rate of 11.5%, a clear indication of the substantial contribution of MSMEs to the Indian economy. During FY 2012, total production of MSMEs was projected to grow at 11.48%, compared to industrial and GDP growth of 8.2% and 8.4% respectively. (MSME annual report 2011-12)

As the problems encountered by MSMEs are often different from those of LEs, a different approach is required to analyze these problems. Literature in the field, indicate that several studies have been made to investigate the main differences between MSMEs and LEs. There are three central aspects in which small firms differ from the LEs: (i) the level of uncertainty, (ii) the nature of innovation and (iii) the type of evolution. Compared with LEs, the MSMEs in general deal with fewer products, fewer customers and lower volume and are also lacking in economies-of-experience and a capacity to learn. LEs have higher capital and transaction costs, are reactive in nature and technologically focused with strong marketing skills. Limited resources and a high strategic reliance on the CEO’s perception of market forces make these smaller enterprises more vulnerable in a competitive market (Coviello and McAuley, 1999; O’Gorman, 2001). As the structure of the SC in MSMEs is very small with dedicated customers and few suppliers, it is essential to explore the influence of e-business systems in the performance of SC as the contribution or support from the customers and suppliers.

2.4 E-BUSINESS IN MSMEs

2.4.1 Status of e-business in SMEs

Koh and Maguire (2004) studied the extent to which e-business and knowledge management approaches are being used by SMEs in UK. The
result of the study shows that SMEs have increasingly applied e-business for B2B and B2C activities. But, however SMEs are not generally aware of how knowledge can be created through the use of e-business applications and day to day operations. The findings from this study provided a major step to move forward in developing a reference framework and a management model for SMEs to assess, manage and make use of the existing and new e-business tools and knowledge, reflecting the e-business and knowledge management era.

Fillis (2004) developed a conceptual framework to identify the reasons behind adoption or non-adoption of e-business in small firms of central Scotland. While the study highlighted that the end customer dictates the business and SMEs use e-business for long term profitability, no discussion on the level of adoption of e-business system was made.

The study by Dholakia and Kshetri (2004) explored in terms of ownership of a web site (adoption) and use of the Internet for selling purposes (routinization) in a mid-sized town in New England region of U.S.A. The results suggest that specific factors contribute to the SMEs’ involvement with the Internet. The use of technology and the customer service of perceived competitive pressure influence various stages of internet adoption.

Koh and Simpson (2005) investigated how enterprise resource planning (ERP) systems could create a competitive advantage for SMEs in south England. The result shows that a different group of underlying causes of uncertainty significantly affect the product delivery performance in make-to-stock, make-to-order and mixed mode (MM) manufacturing environments in SMEs. This research found that ERP could improve responsiveness and agility to change, but not to uncertainty. Nevertheless, SMEs could create a competitive advantage by being more responsive to change in the ERP system before generating purchase and work order. ERP systems could not deal with
uncertainty due to its stochastic and unpredictable nature. SMEs could create competitive advantage by being more responsive to changes using of ERP as a production planning and control tool. These changes refer to any updation of necessary information. For example, extension of due date of customer order and change of dimension in product design using the ERP system before generating purchase and work order. However, the changes which arise out of uncertainty, the ERP systems can not deal effectively. This is on account of its stochastic and unpredictable nature, which often occurs after purchase and work order are issued and released (Koh and Simpson 2005).

A study of Indian manufacturing firms to identify and analyze the factors that discriminate medium firms using different types of e-business technologies was made by Lal (2005). The study showed that the firms managed by professionally qualified entrepreneurs adopt more advanced e-business tools and also addressed the role of communication bandwidth in the diffusion of e-business technologies. Though, the importance of the communication bandwidth for diffusion was studied in detail, the level of influence of e-business system on various supply chain components was not addressed.

Stephen and Pieter (2006) studied the e-readiness status of small and medium-sized enterprises (SMEs) in the information and communication technologies (ICT) sector in Botswana and make comparisons with global trends. The findings revealed that SMEs in Botswana, like their counterparts in most developing countries, have not achieved a reasonable measure of e-readiness status compared to the developed world.

Sharma and Bhagwat (2006) conducted a survey to arrive at the outcome of information system (IS) related practice designed to identify current trends in Indian small and medium enterprises (SMEs). The outcome, based on a survey of SMEs, reveal that SMEs understand and acknowledge
the importance of the IS in day-to-day operations management in the present
dynamic and heterogeneous business environment. But they are yet to
implement, operate and exploit it fully in a formal and professional manner so
as to enable them to derive maximum business gains out of it. It was found
that SMEs are not equipped adequately with the IS resources to suit their
needs.

Eikebrokk and Olsen (2007) explored the relationship between e-
business competency and its success in European SMEs. The competencies of
e-business in SMEs were measured with help of information system using
variety of technology competencies to predict the success of e-business. In
this study, the success of e-business relationship as a whole was found to be
different from the success of each constituent. The e-business competency
was measured only in terms of information and communication technologies
employed, but not measured in terms of overall SC performance.

Beheshti and Salehi-Sangari (2007) analyzed the impact of web-
based e-business on SMEs in Sweden. An approach framework to implement
a successful e-business and the development of an e-business strategy was
made. But the study had not developed any comprehensive model to identify
the key e-business influencing factors for the successful performance of SC

Cegarra-Navarro et al (2007) examined the relative importance and
significance of the four learning processes introduced by Huber (knowledge
acquisition, knowledge distribution, knowledge interpretation and
organizational memory) on four different levels of e-business (null, external,
relational and internal), through an empirical investigation of SMEs in the
Spanish telecommunications sector. The results support that in order to
implement e-business, companies need to provide the acquisition,
interpretation and storage of knowledge as prior steps. Then, to consolidate
e-business, companies have to support the distribution of knowledge learnt
during previous phases. The results further suggest that knowledge acquisition is necessary for the progress from relational level to internal level.

Bhagwat and Sharma (2007) developed a balanced scorecard for supply chain management (SCM) that measure and evaluate day-to-day business operations from following four perspectives: finance, customer, internal business process, and learning and growth. Balanced Score Card (BSC) was developed based on extensive review of literature on SCM performance measures, supported by three case studies, each illustrating ways in which BSC was developed and applied in small and medium sized enterprises (SMEs) in India. The study results indicate that a balanced SCM scorecard can be the foundation for a strategic SCM system provided that certain development guidelines are properly followed; appropriate metrics are employed, and surmount the key implementation obstacles.

Vaaland and Heide (2007) study involve identification of the e-extent to which they are prepared to meet SCM challenges through the use of modern planning and control methods. This study was conducted by interviewing the top officials of manufacturing companies of Norway. The findings clearly indicated that SMEs devote less attention to planning and control methods than LEs. SMEs are less satisfied with the methods applied; less concerned with methods supporting SCM on product quality, rationalization of operations and capital cost; less focused on system integration with other actors in the supply chain; and less focused on EDI and e-based solutions.

The emphasis of research work of Koh et al (2007) was primarily to identify the underlying dimensions of SCM practices and to empirically test a framework for establishing the relationships among SCM practices, operational performance and SCM-related organizational performance with special emphasis on SMEs in Turkey. The result of study shows that SCM
practices were grouped in two factors: outsourcing and multi-suppliers (OMS), and strategic collaboration and lean practices (SCLP). The results indicate that both factors SCLP and OMS have direct, positive and significant impact on operational performance.

Maguire et al (2007) investigated the aspect, how SMEs are using Information and Communications Technology (ICT) to gain competitive advantage. The research was conducted in SMEs in the northern region of UK. This research provided sound evidence that SMEs can get competitive advantage through the use of ICT. More than 70 per cent of the respondents identified ICT is aiding their business in one or more of the accepted competitive areas. However, there is potential for SMEs to gain further advantages by using an integrated and strategic approach in their use of ICT.

Pavic et al (2007) examined as how to improve the understanding of e-business, competitive advantage and their roles in the UK SMEs. The study revealed that for some SMEs integration of internet technology into an overall strategy and this new approach could lead to a competitive advantage. However, attitude of owners’ towards new technology, knowledge and skill of management and the workforce are recognized as potential problematic issues.

A performance outcome of the alignment between the e-business capabilities of manufacturing SMEs and their business strategy was studied by Raymond and Bergeron (2008). The survey was made among the Canadian manufacturing SMEs. The result shows that the SME owner managers require greater manufacturing flexibility, increased systems integration, products and services of better quality, and higher levels of product and process innovation for better alignment.
Marasini et al (2008) tried to identify ways of removing the barriers for SMEs and the change approaches used by SMEs to implement internet and information technologies. The study suggests that SMEs tend to favour the improvisational model of technology adoption over the classic change model. The reasons might be the alignment of technology, the organizational context and the change model used.

Welker et al (2008) investigated the influence of business conditions on internal and external information sharing and the role of ICT in order processing, using a multi-case study among SMEs in Netherlands. The study indicate that simple business conditions are associated with limited information sharing and some use of standard ICT applications particularly ERP systems. Complex business conditions tend to be associated with greater sharing of external information.

The investigation of Thakkar et al (2008) was mainly concerned with the issue of information technology (IT) adoption and implementation in Indian manufacturing small and medium-scale enterprises (SMEs) towards enhancing the capabilities of their supply chain. ISM enables recognition of inter-relationships among the factors which were utilized for deriving managerial insights. Further, these factors are classified into four categories, viz., autonomous, driver, dependent, and linkage to understand their relative impact on the implementation of IT in Indian SMEs.

The status of e-procurement as part of e-business in SMEs operating on the South coast of Massachusetts was examined by Gunasekaran et al (2009). The SMEs on the South coast of Massachusetts were not accepting e-procurement, though many of them realize its strategic value and appreciate its potential impact on organizational performance. The study noted that e-procurement is not a top management initiative or priority and there are other barriers such as fear of change, lack of financial support, insufficient skills.
Though the study addressed one of the major e-business enabler e-procurement, it did not cover other issues.

Chong et al (2009) examined the influence of inter organizational relationships on the adoption of e-business in the supply chain of Malaysian SMEs. Inter organizational relationships such as communication, collaboration and information sharing found to be significant aspects that affect Malaysian SMEs’ decision to adopt e-business in their supply chain. Influence of one of the major SC component namely customer relationship was discussed in e-business adoption environment, but, however the study did not cover the influences of other SC components.

Ahuja (2009) carried out a study to assess the factors that affect ICT adoption in Indian construction industries with focus on SMEs at three levels viz., industry, organization and the people. The study showed that the SMEs having higher turnover have higher adoption of ICT. Moreover, the increased overall thrust and the increased spending on infrastructural development were found to enhance the use of ICT tools. It was focused that the construction industry has the capability to effectively link geographically distributed elements using ICT. Though this study discussed factors influencing the adoption of ICT usage, no specific factors of e-business that influence SC was discussed.

Bordonaba-Juste, and Cambra-Fierro (2009) study pertains to Spanish SME to combine technology and a customized strategy in communication management with its suppliers. The result of the study shows that communication between a company and its suppliers is important for improving the efficiency of its supply management. This implies that there is need for better understanding of the importance of customized communication between MSMEs and their micro suppliers by the managers and researchers.
Parker and Castleman (2009) reviewed a range of theories and evaluated their ability to provide a view for explaining the habit of small firms and their e-Business adoption decisions. The critical analysis revealed that no commonly-used theory explain adequately the adoption of e-Business by small firms. This is due to the fact that each theory did not consider important aspects of small firm habit. The analysis suggests that an integrated theoretical framework is needed. Preliminary ideas on this framework are provided.

Bayraktar (2009) empirically tested a framework identifying the causal links among SCM and information systems (IS) practices, SCM–IS related inhibiting factors and operational performance on manufacturing SMEs in Istanbul in Turkey. The results of the structural model also indicated a negative relationship between SCM–IS related inhibitors and the implementation levels of both SCM and IS practices. Similarly, a strong support was found for the hypothesized negative relationship between SCM–IS inhibitors and operational performance of SMEs.

Lopez-Nicolas and Soto-Acosta (2010) investigated the influence of the adoption and use of information and communication technology (ICT) on organizational learning in Spanish small- and, medium-sized enterprises (SMEs). It indicates that ICT has a significant positive influence on the processes for creating knowledge. ICT orientation to communication and workflow was found to produce a significant positive impact on knowledge creation processes, while ICT use for information does not influence any of the processes for creating knowledge and organizational learning.

Chang et al (2011) examined the relationships among factors of IS success model and social cognitive theory in SMEs in Taiwan. The results showed that no direct links exist between computer self-efficacy and information quality or service quality. The relationships between outcome
expectations and both quality of system and service are significant; however, the relationship with information quality is insignificant.

Cragg et al (2011) evolved a framework of IS competencies in small and medium-sized enterprises (SMEs) in Portugal, U.K and New Zealand. The framework significantly improved the understanding of internal IS expertise in SMEs. The competences that reflect all stages of systems development life cycle: recognizing opportunities, IS planning, and defining requirements, software sourcing, applications development, change management, implementation, and use. Also, the framework integrates some competences related to IS topics that have received less attention, including accessing IS knowledge, benefits management, inter-organizational collaboration, and staff development. This framework was built on earlier work.

The study by Wu et al (2011) covered medium sized manufacturing firms in China to measure the capabilities necessary for a firm to build e-business successfully and enjoy greater organizational performance. This study argued and confirmed the necessity of developing a high-quality e-business system, besides addressing e-business service capability and IT-enabled collaboration. Implementation of these resulted in e-business success and improved organizational performance. The e-business success was measured in terms of organizational performance, but not in terms of business performance or the SC performance holistically.

Hertwig (2012) study covered adoption of B2B e-business technology in automotive supplier SMEs in Germany. E-business implementation to meet the demands of business partners like customers and suppliers was found to be an important factor in all business functions. Further, the study revealed that when companies implement an e-business-
system, they were often coercing business partners to use the system to ensure integration and efficiency. Mainly this study covers ways of e-business implementation,

Ramanathan et al (2012) explored the impact of e-commerce on marketing and operations functions and investigated how these impacts have affected the performance of Taiwanese SMEs. The study found that operations and marketing aspects of e-commerce have strong impacts on the performance of SMEs. While SMEs’ size moderate the impact of operations and marketing aspects on performance, e-commerce experience measured using the length of time SMEs using e-commerce does not seem to affect.

Exploration of the skill demands for implementation of e-business in SMEs of Taiwan was conducted by Wu and Li (2012). The result of the study showed that the SMEs need the support of both academia and government, which can set the right path for fostering skilled e-business professionals.

Chan et al (2012) studied factors that influence the diffusion of e-collaboration in SCM among three different SMEs in Malaysia. This study proposed a research model to examine a stage-based e-collaboration diffusion process in SMEs. Also, a theoretical framework was provided for understanding the relationships between diffusion factors and the diffusion stages of e-collaboration in supply chains involving SMEs. The model presented is an integrated one from Technological-Organizational-Environmental (TOE) framework, Inter-organizational Relationships, (IOR), Unified Theory of Acceptance and Use of Technology (UTAUT), and is applied to examine stage based e-collaboration diffusion.
2.4.2 E-business Influence on SCM Components

Lancioni et al (2000) explored how the Internet is used in managing major components of supply chains including transportation, purchasing, inventory management, customer service, production scheduling, warehousing, and vendor relations. Necessary data was collected from a set of representative manufacturing firms in Los Angeles, California. The study reveals how each area was segmented and also describe to what extent and how the Internet is being applied. The study also looks at the development of Intranets

Schlenker and Crocker (2003) examined and analyzed the value of Internet technologies and the factors that account for the lack of successfulness of small business deployments of the SME Gateway in South Africa. The result of the study shows that partnerships with technology suppliers be evaluated at the best by the business value present in the relationship. Small firms might explore their business, market and vision with their current and potential suppliers.

Rahman (2004) study covered the usage of Internet in the management of various areas of supply chain by Indian companies. The findings of the study shows that internet will continue to provide with fast and accurate information from a wide range of operating areas including transportation, inventory, purchasing, customer service, production scheduling, order processing, and vendor operations to enable them to improve profitability of their supply chain.

Gunasekaran and Nagi (2004) reviewed the available IT in SCM and they have not only classified using suitable criteria, but also critically reviewed to develop a framework for studying the applications of IT in SCM. The results indicate that information systems architecture needs to be
designed for SCM that could be different from that of traditional organizations. Successful strategic information systems are not easy to implement in SCM. They require major changes in issues as how a business operates internally and also with external partner. Commercial enterprise information systems require flexibility in order to accommodate individual organizational characteristics.

Auramo et al (2005) explored to provide empirical evidence of benefits from IT in supply chain management. This research was conducted in progressive companies in Finland. Arising out of the study they came out with five propositions on the use and benefits of IT. Firstly, successful companies have developed focused e-business solutions for improving customer service elements that are most important in their business. Secondly, improved efficiency allows company personnel to focus more on critical business activities. Thirdly, the use of e-business solutions improves information quality. Fourthly, e-business solutions support planning collaboration and improved agility of the supply network. Finally, to gain strategic benefits, the use of IT has to be coupled with process redesign.

Burn and Ash (2005) explored a dynamic model for e-business strategy derived from the results of a longitudinal analysis of enterprise resource planning (ERP) enabled organizations among the manufacturing firms in Australia. The result shows that the model focuses on realizing the benefits of B2B interaction through the alignment of ERP with different e-business strategies, emphasizing on employee empowerment and successful management of value alliances.

Lin and Lee (2005) studied the impact of organizational learning factors (training available, technical expertise, and knowledge level) and knowledge management processes (knowledge acquisition, knowledge application, and knowledge sharing) on e-business systems adoption level.
The required data was collected from the executives of the firms in Taiwan. The study found that organizational learning factors and knowledge management processes are closely related to the level of e-business systems adoption, but however, knowledge sharing did not significantly affect e-business systems adoption level.

Ramsey and McCole (2005) conducted a study to explore the reasons for New Zealand firms in the professional industries being slow in embracing e-business technologies. The main conclusion derived from this study is that a combination of factors influences a firm’s current and future level of e-business adoption. These factors include: being able to understand potential e-business benefits; being able to respond to customer and competitor practices; being prepared to develop staff skills and knowledge of internet-based technologies (IBTs); and having a well justified and strategic orientation towards e-business.

Developments in e-business system adoption and deployment in support of SCM in UK manufacturing firms were explored by Croom (2005). As a result of research, the impact of e-business developments on supply chain management has been evolved as a five-stage evolutionary model. While stage one and two represent “customer acquisition” and “customer management” respectively, the stage three represent the utilization of e-business systems to support operation process management. Stage four emphasizes a move towards integrating supply-side activities and stage five represents integrated e-supply chain management

Oyelaran-Oyeyinka and Lal (2006) examined the ways in which small and medium enterprises in selected developing countries learn to use and augment their core capabilities with new technologies. Three major findings are there from the study. First, there is clear evidence of increasing complexity in the adoption and use of Information and communication
technologies (ICTs) among developing country firms. Second, climbing the technological ladder requires skills upgradation through explicit learning of the new technologies. Third, firm performance is highly associated with learning capabilities, levels of technology, and a host of firm-level knowledge, skills and experience.

Angeles and Nath (2007) made a study to understand the current business-to-business (B2B) e-procurement practices by describing the success factors and challenges to its implementation in corporate setting. The data was gathered from manufacturing firms in USA. The results of the analysis highlighted that three e-procurement success factors: supplier and contract management; end-user behavior and e-procurement business processes; information and e-procurement infrastructure. Also, the following three challenge-to-implementation factors (CIF) emerged: lack of system integration and standardization issues; immaturity of e-procurement-based market services and end-user resistance; maverick buying and difficulty in integrating e-commerce with other systems.

Yin and Khoo (2007) exploration led to the realization of a hierarchical model for e-supply chain coordination and optimization. These modules enable: the generation of preferred routings, transportation modes and work order plan under such constraints as customer service level, cycle time and cost; the formation of supply chain’s unit-transportation-work order families using a clustering approach to down-size supply chain problems and increase computation efficiency; and integration of scheduling with supply chain optimization to facilitate the control of a supply chain with the aid of an agent-based distributed scheduling approach.

Cullen and Webster (2007) conducted a study to evolve a complete and comprehensive model by which business-to-business (B2B) e-commerce transactions for sales and purchases between organizations can be
categorized. The study found that the model developed, incorporating nine exclusive e-commerce trading scenarios, covering all B2B selling and purchase transactions, is comprehensive one. It further found that trading occurs in each of the nine scenarios within the model, thus suggesting that it is complete. These findings support the conclusion that the model represents a valid taxonomy for the classification of B2B e-commerce transactions.

Sanders (2007) proposed a model of the relationship between organizational use of e-business technologies, organizational collaboration and performance using empirical data collected from US companies. The findings reveal that use of e-business technologies impacts performance both directly and indirectly, by promoting both measures of collaboration. Intra-firms collaboration is also found to have a direct impact on organizational performance.

Giménez and Lourenco (2008) analyzed the interaction of two aspects: supply chain management (SCM) and the internet. Merging these two fields is a key area of concern for contemporary managers and researchers. This paper describes the impact that the internet has on the different processes that SCM embrace. Result of the review provided way to describe the impact that internet has on different SC processes. The review resulted in the development of a framework for the analysis of e-SCM particularly in the areas of e-procurement, e-fulfillment and information flows.

The investigations by Zhao et al (2008) explain the causal relationships among strategic initiative, Information Technology (IT)-related resources, and e-business capabilities; and their roles in the implementation process. This research was conducted in manufacturing enterprises of the Hubei province of China. The result shows that information sharing capabilities are intermediate and transferable forces that help translating
IT-related organizational resources into collaborative process capabilities. While, the causal relationships expand our understanding of the dynamics of organizational transformation enabled by the Internet, the practical implications offer managers guidelines to the roles played by strategy, resource, and capabilities for e-business success.

The buyer-seller relationship was explored by Boeck et al (2009) by focusing on how its development influences and is influenced by the use of B2B e-commerce strategies. The research was conducted using multiple case studies of companies in Canada. The results indicate that large buyers use specific e-commerce processes and tools for the different relationships they have with their SME suppliers. Further, they must adapt to these requirements inorder to attain the next relationship level or risk forfeiting their established position. When a supplier reaches the new level, other requirements arise, forcing it to continuously adapt its e-commerce strategy.

Sambasivan et al (2009) conducted a study to consolidate the measures and metrics that have been developed so far to verify the relevance of these measures from the practitioners, produce a usable list with proper classification (database), besides demonstrating the use of this database through a case study. As a result of study, the performance measures from the entire list of measures has been classified into the following metrics: Fund flow, Internal process flow, Material flow, Sales and services flow, Information flow, and Partner evaluation.

Trkman et al (2010) investigated the relationship between analytical capabilities in the plan, source, make and deliver area of the supply chain and its performance using information system support and business process orientation as moderators. Structural equation modeling employed using sample of companies from different industries in USA, Europe, Canada, Brazil and China. Findings of the study suggest existence of a statistically
significant relationship between analytical capabilities and performance. The moderation effect of information systems support is considerably stronger than the effect of business process orientation. The results provide a better understanding of the areas where the impact of business analytics may be the strongest.

Saprikis (2013) conducted an empirical study on reverse e-auctions, which are increasingly used as an alternative business-to-business e-procurement model to exchange products and services among enterprises in Greece. The result showed that active suppliers have scientifically confirmed evidence of factors that impact on level of e-reverse auctions use. Top management executives can evaluate this information and pursue specific strategies to improve their e-sourcing practices and as a result increase their profitability.

2.5 RESEARCH PROBLEM AND HYPOTHESES FORMULATION

2.5.1 The Research Gap

It may be noted from the above review of literature, that several studies are there involving IT or e-business in supply chain literature, but most of them discusses only the implications of one or two aspects of supply chain, strategies, tools and techniques, but not in its totality. Moreover, the influence of e-business system for an effective SCM has not received adequate attention from both researchers and practitioners especially relating to Indian MSMEs. Thus from the review of Literature, the main research gaps identified are:
• Very few studies on the influence of e-business in an MSMEs environment as compared to substantial research on the e-business influence in large Enterprises (LEs)

• Lack of clarity as how e-business influences supply chain decision areas in MSMEs to improve their working and competitiveness.

• Limited understanding of the usage pattern of e-business technologies and its direct benefit in MSMEs.

In the light of the above, it is thought that a comprehensive study of e-business in SCM of MSMEs will be useful to identify the critical success factors of e-business that influence SC, will be a significant contribution to the literature in general and MSMEs in particular.

2.5.2 Problem Perspective

Keeping in mind the gap identified, the purpose of the research is to explore the influence of e-business systems on SC in MSMEs, which contribute to SC performance improvement. As the MSMEs have SC structure similar to that of LEs, though in a small scale, it is possible that the benefits enjoyed by the LEs using e-business systems are also replicable by MSMEs. As Indian MSMEs are in the stage of adoption of e-business system for their SC, the level influence of e-business system in MSMEs needs to be evaluated in all the components of SC. The components of SC start from supplier at one extreme and end at customer at the other extreme and coupled with linkages between the entities of the SC. Effect of the e-business system will be realized in these linkages in the form of decision making areas like procurement and order processing decision, inventory management decision, and transportation management decisions and so on.
The influence of e-business systems is expected to result in performance improvement in the supply chain. The performance improvement can be measured in terms of the financial metrics, time based performance metrics for business performance and the overall performance of supply chain. Other specific performance aspects like trading partner performance and customer service performance also have to be measured.

As the MSMEs structure is smaller, but may not be exactly similar compared to LE, the SC performance measures applicable to LE will be at very micro level for MSMEs. Therefore, it is essential to identify some broad specific factors to be followed by MSMEs to improve their SC performance. In addition, the scope of the research study covers development of a ISM model, which will result in identifying the key driving factors for the manufacturing MSMEs to enhance their effectiveness of outcomes of e-business system implementation.

It may be noted from the above review of literature, that several studies are there involving IT or e-business in supply chain literature, but most of them discusses only the implications of one or two aspects of supply chain, strategies, tools and techniques, but not in its totality. Moreover, the influence of e-business system for an effective SCM has not received adequate attention from both researchers and practitioners especially relating to Indian MSMEs.

2.5.3 Formulation of Hypotheses and Relationships

Within the perspective of problem identified, a set of general hypothesis are formed which will be examined by using the primary data by statistical testing. The following are the generic hypothesis formulated based on the literature reviewed.
i) The e-business systems currently available in MSMEs depends on category of MSMEs a firm belongs (Micro, small and Medium Enterprises).

ii) The success in managing the SCM in MSMEs depends on the e-business system currently available.

iii) The benefits gained out of using SCM enablers depends on the category of MSMEs (Micro, small and Medium Enterprises).

Apart from generic hypotheses, based on the literature, the following relationships have been identified, which will be evaluated using appropriate statistical tools.

i) Establishment of relationship between benefits and SC enablers.

ii) Bench marking of SCM activities and the support by top management of MSMEs are associated.

iii) Inter-relationship exists between measure of performance and the usage of SC enablers in MSMEs.

iv) Relationship exists between measure of performance and usage of SCM attributes in MSMEs.

v) Business performance and the usage of SC enablers in MSMEs are inter-dependent.

vi) Association exists between long term relationship with suppliers and e-business influenced procurement decision factors.
vii) Relationship exists between measure of performance and e-business powered inventory management decision factors.

viii) Trading partner performance and e-business enabled transportation management decision factors are dependent.

ix) Long term relationship with suppliers is associated with e-business inspired order processing management factors.

x) Customer related performance and e-business influenced customer service management factors are related.

xi) Trading partner performance depends on e-business powered long term relationship with suppliers.

The research gap provides the importance of the need for the influence of e-business systems on SC in MSMEs, which contribute to SC performance improvement and the need for usage of e-business systems in SC components to get the direct benefits. The above generic hypotheses and relationship based on the literature have been identified to study and analyse the research gap identified.