CHAPTER 6
SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

6.1 ANTECEDENT OF THE STUDY

Globally, integration of supply chain functions and use of technology for its effectiveness has become a necessity for most of the industries. In India where agriculture and manufacturing are the major contributors of the economy, the need for supply chain management technologies are much felt. Indian manufacturing sector has a high growth potential in the domestic market and a huge international market through exports. Industry such as auto component manufacturing are supplying to European and American automobile manufacturers. Subsequently these exporting units are supported by small and medium sub-contracting units. Criticality of the order processing has made the companies integrate with their customers as well as suppliers. A similar trend is also seen in the electronic goods manufacturing sector, which caters to a large range of domestic household, industry and defence markets. The prominence of textile industry and the need for up gradation has kept the textile machinery manufacturers active. However, these units are required to be competitive to face the challenges from foreign manufacturers who find a better market due to their technology and sophistication.

As the trend is towards greater use of supply chain technologies such that the organisations in the supply chain are seamlessly connected, the
study on the adoption of such technologies, industry wise and business area wise is very much required. With the information and communication technologies advancing into every aspect of life and business, organizations need to adopt an electronic commerce technology that enables supply chain integration.

Supply chain costs in India represent as much as 13 percent of the GDP. This is almost double the percentage in developed countries: in the U.S., supply chain costs amount to 8.5 percent of the GDP. Environmental leader (2010) predicted that from 2010 to 2015, the global Supply Chain Management market is projected to increase from $5.90 billion to $8.55 billion. This represents a compound annual growth rate (CAGR) of 7.7% during this time period. Similarly, TechNavio’s analysts forecast the Global Supply Chain Relationship Management Software (SRM) market to grow at a CAGR of 7.98 percent over the period 2011-2015. One of the key factors contributing to this market growth is the growing demand for real-time interaction with suppliers. The Global SRM Software market has also been witnessing increasing demand for SaaS-based solutions. TechNavio’s report, the Global SRM Software Market is dominated by Ariba Inc., JDA Software Group Inc., Oracle Corp., and SAP AG. There are many other vendors such as Epicor Software Corp., Iasta Inc., Zycus Inc., Computer Sciences Corp. (CSC) CloudSRM, Biznet Solutions Ltd., and Whiztec Software. With a global trend positive on adoption of SCM, the Indian industry still lacks the advantage of using the SCM.

The analysis of SCM literatures reveal that there are many key factors that influence the adoption of supply chain technology. The main variables that are found in the literature are firm size, organizational structure, integration of supply chain strategy with overall corporate strategy, past financial performance, supply chain partner pressure, awareness of SCM
benefits and challenges, Complexity and need for information integration, transaction climate and environmental uncertainty. The importance of the manufacturing industries, the need of the supply chain management technologies and the factors that influence the adoption of such technologies requires a detailed research. Therefore, the following research question is framed for the study.

“What are the factors that influence the adoption of SCM in the supplier industry to connect to their buyers in B2B relationship and does it vary between the type of industry and the place of business?”

Under this background, this study aims at investigating the influence of information intensity in the supply chain, Environmental factors, Customer relationship, business strategy adopted, Strategic value of IT and the awareness of benefits and challenges in adopting SCM technologies in different industries placed in different cities.

To answer the research question the following objectives are framed for the study:

- To study the application of SCM technology in E-Commerce activities among Indian industries.
- To study the factors that influences the adoption of SCM. in Indian industries.
- To investigate the information intensity in the supply chain that influences the SCM adoption.
- To explore the environmental factors that influences the adoption of SCM.
To understand the business strategies of Indian firms that encourages them to adopt SCM.

To identify the problems and challenges faced by the industry in adopting SCM.

To analyze if the place of business influence the adoption of SCM among the industries in Coimbatore, Bangalore and Chennai.

To analyze the difference in adoption of SCM among the various industries such as electronic goods manufacturing, Auto component manufacturing and textile manufacturing industries.

The study was conducted among the electronic goods manufacturing companies, auto component manufacturing companies and textile machinery manufacturing companies in the cities of Coimbatore, Chennai and Bangalore. The sample framework was created by collecting information about the industries from their respective trade associations and registrar of companies. From the sample framework, at an average, 10 % of the companies were randomly selected as the sample. The questionnaire was mailed to the companies. Questionnaire was directly given a few companies that were accessible. The respondents were asked to complete the questionnaire and return it back. The main constructs were adapted from Patterson, Grimm, and Corsi (2003). The questionnaire was further developed with literature support and interviews with academicians and industry experts. The instrument was validated and pretested. Around 300 companies were contacted and 253 responses were collected by multimode contact. Nine responses were found unusable due to incomplete information.

The collected data were coded and entered into a spreadsheet. Further, the data was filtered, cleaned and tabulated for further analysis. The
analysis was done in three stages. First, the descriptive statistics calculating the frequency, the mean and standard deviation were done to explain the nature of the respondents. The validation tests were done to check the reliability and validity of the instrument used for collecting the data. Reliability tests included cronbach alpha, AVE and composite reliability. The validation was done by confirmative factor analysis using PLS method. The inferential statistics were done to understand the relationship between the variables, their influence on one another and the difference between the demography groups. Cross tabulation with chi square, ANOVA, regression analysis and Kruskal-Wallis tests were done. The results are inferred and hypotheses were tested. The major findings are discussed in the next section.

6.2 FINDINGS FROM THE PRIMARY DATA

The samples were collected from Coimbatore, Chennai and Bangalore, from three different industries namely auto component manufacturers, electronic goods manufacturers, textile machinery manufactures. All together 244 responses were received.

There were 70 (28.69%) respondents from Chennai, 119 (48.77%) from Bangalore and 55 (22.54%) from Coimbatore. This reveals that more respondents are from Bangalore.

Of the 244 responses received, 92 (37.70%) respondents are from electronic goods manufacturing. 58 (23.77 %) are in auto component manufacturing and 94 (38.52%) respondents are from textile machinery manufacturing industry. This reveals that majority of the respondents are from textile manufacturing Industry and almost equal responses were from electronic goods manufacturing industry.
It is found that majority of the respondents are from proprietorship companies (46.72%) followed partnership companies (36.48%) and Private limited companies (16.8%).

Analyzing the type of operations majority of the respondents are job work manufacturers (51.64%), followed by manufacturing suppliers (34.02%) and OEM Manufacturers (14.34%).

The organizational size of the respondents reveal that majority of them are small enterprises (69.67%) and the rest are medium enterprises (30.33%).

Analyzing their market area served, majority of the companies served the regional market (52.46%). Around 40.57% served the national market and the rest 6.97% served the international markets by exports.

Investigating the availability of Servers in the firms of the respondents it is found that majority (83.2%) of them did not have servers. Only 16.8 % reported that they have one server.

Understanding the availability of personal computer (PCs) majority of the respondents has them between 1 to 10 numbers. It is also found that 4.51% of them do not have PCs. On an average there were 7.63 PCs owned by the companies.

It was found that majority of the respondents (23.77%) have at least two printers. 4.51% of them do not have printers. This is similar to their response on PCs. It is obvious that the respondents who did not have PCS responded that they did not have printers. Respondents had maximum 5 printers and an average of 2.84 printers
Analysing the availability of scanners, majority of the respondents (39.75%) did not have scanners. The respondents had a maximum of two scanners.

This study also reveals that majority (54.10%) of them did not have a manager/engineer or somebody to handle the IT infrastructure. 45.90% of the respondents has a person to manage the computer systems.

It is found that majority of the respondents (93.85%) have internet connection. Only 6.15% of the respondents did not have Internet connection.

This study found that majority of the firms (97.95%) has email account. Only 2.05% of them did not have email account.

It is evident from the data that majority of the respondents (51.64 %) do not have corporate website, only 48.36% of the respondents had corporate website. Similarly, 55.74% of the respondents have corporate email.

It is found that majority of the firms (50.82%) have used EDI to connect with their business partners. However, half of the sample firms (49.18%) have not used EDI.

The study found that majority of the firms (81.15%) have LAN infrastructure connecting the computers in their firms. Comparing the number of PCs, all those who have more than two PCs have connected them. A few firms with more number of PCs still use them as standalone.

The results revealed that majority of the firms (88.93%) did not implement ERP. Only 11.07% firms have implemented ERP. Similarly, majority of the firms (95.49%) do not use CRM technologies and majority of the respondents (82.38%) of them do not use SCM technologies.
The study shows that majority of the firms (55.74%) use CAD/CAM facility and equally many firms do not use CAD/CAM facility.

The case summary of supply chain characteristics reveals that the respondents had a maximum of 18 customers at an average of 5 customers. The strategic customer is the main customer who is very important to the firm and whose requirements and suggestions form the strategic decision of a firm. At the maximum companies have 5 strategic customers at an average of 1.89. This means that on an average each company served two companies with priority.

The results can be inferred as that the respondents have a minimum of five suppliers to 60 suppliers at an average of eight suppliers. A strategic supplier is one who is an important supplier on whom the firm is dependent on. There are maximum 20 suppliers at an average of three strategic suppliers.

The results reveal that the maximum number of carriers was around seven. However some responded have no carriers. They are job work firms for whom the customer/buyer delivered the raw material and picked up the finished goods. It can also be inferred similarly on the third party logistics.

It is concluded from the results that the percentage of firm’s customers and suppliers connected with E-Commerce in some cases were zero and in some cases it was found to be 100%. This can be inferred that the online transaction with customers and suppliers by the firms has extreme variation from zero to hundred. However it is also found that the industry averages of such transaction with customers are very low at 23.01%. Similarly, with that of the suppliers is also very low at 12.98%.

It is evident from the results that the percentage of documents transacted through E-Commerce technology was only at a maximum of
80%, meaning that there are always some documents that are transacted manually.

The case summary of the information intensity variable can be analyzed and inferred that ‘closely integrate with suppliers’ have the highest mean value of 3.20 and ‘dependent on up-to-date information’ has the least mean score of 3.07. The other variables are also positively perceived and agreed to.

It is found from the study that ‘Need Reliable, relevant and accurate information’, ‘Dependent on up-to-date information’ are agreed by majority of the respondents. It is evident that on ‘Access to information quickly’, ‘Integrate within organisation’, ‘Provide reliable, relevant and accurate information’ and ‘closely integrate with our suppliers’ majority of the respondents stay neutral.

It is understood from the case summaries of business strategies that ‘Compete by offering a wide range of products/services’ has the highest agreement among the respondents and ‘Compete by distinctively different products/services has the lowest agreement. It is also evident that all mean values are above the mid value three, it can be inferred that there is a slight agreement with the business strategies.

It is highlighted from the frequency distribution that majority of the respondents agreed with the statements ‘Compete by quality products/services rather than price’, ‘Compete by offering a wide range of products/services’, ‘The rivalry in the industry is very intense’ and ‘Customers have choice to switch suppliers’. It is also evident from the frequency distribution that on the statements ‘Compete by cheaper pricing of products/services’, ‘Compete by distinctively different products/services’, ‘Improve the efficiency of our production process’, ‘Compete by providing quality service to our customers’
and ‘Customer have choice of substitutes’ majority of the respondents remained neutral on their agreement.

It is concluded from the case summaries of IT Strategic Value that ‘Improve quality’, ‘Improves efficiency of production process’ and ‘Assists in identifying new markets’ have the highest mean. The item ‘Helps to diversify’ has the lowest mean value. However, the mean values of all the items are less than mid value. It is therefore can be inferred that many of the respondents did not agree with the statements that supports that IT can provide a strategic value. These findings are also observed in the frequency distribution. Majority of the respondents neither agreed nor disagreed with the IT strategic value and had stayed neutral.

It is revealed from the case summary of business environment that the variable ‘Company faces change and uncertainty’ has the highest mean value. The variable ‘Extremely complex supply chain’ (2.99) has the lowest mean value. The mean values of all other variables are between this and are above three. It can be inferred that the respondents agree with the most of the statement on the environment factors. This shows that the environment factors are more active in the industry being studied.

The frequency distribution of the data reveals that on statements such as ‘Extremely complex supply chain’, ‘Company faces change and uncertainty’, ‘The industry faces much change and uncertainty’ and Customers adopt new technology quickly’ majority of the respondents have agreed with the statement. This reveals that the industry taken for the study has complexity and faces challenges.

The frequency distribution also reveals that majority of the respondents neither agreed nor disagreed with variables such as ‘Stable
demand for goods and/services’, ‘Suppliers adopt new technology quickly’, ‘Carriers adopt new technology quickly’ and ‘Stable supplier base’

The case summary of the customer relationship reveals that variables ‘Customers encouraged for SCM’ and ‘Trust’ have the highest agreement among the respondents. The variables ‘switches customers’, ‘Strong commitment’ and ‘Satisfied on Information exchange’ have the lowest mean of all the items. This means that the respondents disagree with the statements. On an average, the customer relationship is found to be moderate.

It is apparent from the frequency distribution that majority of the respondents agree that they encouraged customers for SCM and similarly were encouraged by customers for SCM.

It can be identified from the case summary of business pressures that customer pressure is the highest and the demand of distant partners is has the least pressure. It can be inferred that there is business pressure from various partners.

It can be noted from the frequency distribution that majority of respondents felt a significant amount of Industry pressure and customer. Majority of respondents felt somewhat pressure from their suppliers and distant partners.

The case summary of SCM benefits revealed that the respondents were more aware of that SCM can provide improved customer service and will reduce the cost of placing orders. The respondents were only little aware of the benefits such as improve on-time delivery from suppliers and Improve product to market speed.
It is identified from the frequency distribution that majority of the respondents are of the opinion that only some benefits from SCM adoption. However, majority feel that the SCM can provide improved information sharing between business partners.

The case summary of SCM challenges proves that the respondents feel that the challenges are not much. However, they feel that High maintenance as a major challenging factor. High cost is felt as less challenging. This is also apparent from the frequency distribution that majority of the respondents have said that they the SCM challenges are not much.

It is observed from the reliability statistics that all the measures used for the study are reliable and consistent. Therefore, the results can be inferred with confidence. The validity of the items that measure the constructs that were tested using Confirmative factor analysis (CFA) using SEM technique in PLS tool proves that the items are highly associated with their latent construct and there are no cross loading observed. It can be conclude that the instrument has convergence and discriminant validity.

It is observed from correlation between the constructs of the study that the information intensity is positively but weakly correlated with pressure, business strategy, IT Strategic value, SCM benefits and challenges. It is identified that it is moderately and positively correlated with environment, customer and adoption.

It is noted that environment is strongly correlated with customer, business strategy. It is moderately correlated with pressure and adoption. It is weakly correlated but positively correlated with IT Strategic value and Benefits. On the other side environment is weakly and negatively correlated with Challenges.
The results of correlation tests reveal that customer relationship is positive and strongly correlated with business pressure, Business strategy and SCM adoption. It is also evident that customer relationship is moderately and positively correlated with IT Strategic value and Benefits. It is negatively and weakly correlated with Challenges.

The correlation results highlight that business pressure is strongly and positively correlated with Business strategy and SCM Adoption. It is moderately and positively correlated with IT Strategic value. It is weakly correlated but positively correlated with Benefits. However, it is weakly and negatively correlated Challenge.

It is apparent from the correlation test that business strategy is positive and strongly correlated with Adoption. It is weakly correlated but positively correlated with IT Strategic value and Benefits. However, it is weakly and negatively correlated Challenge.

The correlation study reveals that IT Strategic value is weakly correlated but positively correlated with Benefits and SCM Adoption. However, it is weakly and negatively correlated challenge.

It is identified from the correlation test that benefit is weakly correlated but positively correlated with Adoption. However, it is weakly and negatively correlated Challenge. It is also evident that Challenges is moderately but negatively correlated with Adoption.

It is evident from the regression test that there is linear relationship between the pressure and business strategy and therefore, it is concluded that the business pressure can predict the business strategy. Business pressure influences business strategy. It may be inferred that higher the pressure from the industry, the higher is their business strategy towards adoption of SCM.
It is apparent from the regression test that there is linear relationship between the customer and business strategy and therefore, it is concluded that the customer relationships can predict the business strategy. The degree of customer relationship will influence business strategy. It can be inferred that the higher pressure from the customer will lead to the higher business strategy towards adoption of SCM.

It is identified from the regression test that there is influence of information intensity on business strategy. In addition, it is also understood that the Information Intensity can predict the business strategy. Therefore, it can be inferred that when the information Intensity is higher, the business strategy towards adoption of SCM is also higher.

It is observed from the regression test that there is linear relationship between the environment and business strategy. Therefore, it is concluded that the environment can predict the business strategy. The business environment influences the business strategy. It can be inferred that higher the environment factors, the higher are their business strategy towards adoption of SCM.

The regression test reveals that Environment, Pressure, Intensity and Customer will influence the business strategy and it is concluded that the environment, pressure, intensity and customer can predict the business strategy. It can be inferred that higher the customer interaction and Information intensity, higher will be the business strategy towards adoption of SCM.

It is noticed from the regression test that there is linear relationship between the IT Strategic Value and business strategy and it is concluded that the IT Strategic Value can predict the business strategy. It is also conclude that the IT Strategic Value will influence the business strategy. Thus, the
higher the IT strategic value, the higher is their business strategy towards adoption of SCM.

It is evident from the regression test that there is influence of pressure on IT Strategic Value. It is concluded that the Pressure from industry can predict the IT Strategic value. Therefore, it can be inferred that the when the pressure is higher, the IT strategic value is also higher.

It is apparent from the regression test that there is linear relationship between the customer and IT Strategic Value. Therefore, it is concluded that the customer can predict the IT Strategic Value. In addition, it is concluded that customer can influence the IT Strategic Value. It can be inferred that the higher the customer interaction in the industry, the higher is their IT Strategic Value.

It is identified from the regression test that there is influence of Information Intensity on IT Strategic Value. It is concluded that the Intensity of information between business partners can predict the IT Strategic value. It is therefore inferred that when the information Intensity is higher, the IT strategic value is also higher.

It is observed from the regression test that there is linear relationship between the Environment factors and IT strategic value. Therefore, it is concluded that the Environment factors can predict the IT strategic value. In addition, it is conclude that the Environment factors can influence the IT strategic value. It is inferred that higher the environment factor of the industry, the higher is their IT strategic value towards adoption of SCM.

The regression test reveals that Environment, Pressure, Intensity and Customer will influence the IT strategic value. In addition, it is concluded
that the environment, pressure, intensity and customer can predict the IT strategic value. It can be inferred that higher the pressure from the industry, customer interaction and Information intensity, higher will be the IT strategic value towards adoption of SCM.

It is noticed from the regression test that there is influence of challenges on SCM adoption. It is concluded that the challenges can predict the SCM adoption. It can be inferred that when the E-Commerce challenges are higher, the SCM adoption is lower.

It is evident from the regression test that there is linear relationship between the benefits and SCM adoption. Therefore, it is concluded that the benefits can predict the SCM adoption. It is also conclude that benefits can influence the SCM adoption. It is inferred that higher the benefit of E-Commerce, the higher is the SCM adoption.

It is apparent from the regression test that there is influence of Business Strategy on SCM adoption. Thus, it is concluded that the Business Strategy can predict the SCM adoption. It is inferred that that when the Business Strategy is higher, the SCM adoption is also higher.

It is identified from the regression test that there is linear relationship between the IT Strategy and SCM adoption. It is concluded that the IT Strategy can predict the SCM adoption. It is concluded that IT Strategy can influence the SCM adoption. It is inferred that higher the IT strategy from the industry, the higher is their SCM adoption.

The regression results reveal that Business strategy, IT Strategic Value, Benefits and Challenges will influence the SCM adoption. It is inferred that higher the business strategies, challenges, IT Strategy, higher will be the SCM adoption.
It is evident from the path analysis using PLS that ‘SCM adoption’ is explained by the Business Strategy, IT Strategic Value, E-Commerce Challenges and E-Commerce benefits. It is found that business strategy has high impact and the benefits have the low impact. Challenges have a negative impact on the SCM adoption. It is also observed that intensity, environment, pressure and customer influence both business strategy and IT strategic values are all positive.

It is evident from the Kruskal-wallis test that there is difference in the SCM adoption depending on the type of market served (Regional, National and International).

It is noted from the Kruskal-wallis test that SCM adoption depends on the organisational size (Small, Medium and Large).

It is noticed from the Kruskal-wallis test that there is no significant difference in the SCM adoption based on the type of operation (Job Work, Manufacturing Supplier and OEM Manufacturer).

It is apparent from the there is no significant difference in the SCM adoption depending on the ownership type (Proprietorship, Partnership, Private Limited and Public Limited).

It is observed from the Kruskal-wallis test that there is significant difference in the SCM adoption based on the type of business (Electronic goods, Auto Components and Textiles Machineries).

It is identified that Kruskal-wallis test that SCM adoption do not depends on the place of business (Chennai, Bangalore and Coimbatore).
Overall results of Kruskal-Wallis test prove that the SCM adoption varies with the demographic characteristics and it is found that SCM adoption is found to vary with market area, organisational size and type of business.

It is evident from the ANOVA test that there is no difference on the supply chain characteristics based on the types of ownership.

It noted from the ANOVA test that there is significant difference between the cities on percentage of customer and suppliers connected through E-Commerce and the use of e-documents. It is found that there is no difference other characteristics. It is therefore inferred that the city has influence on the use of ecommerce with the customers and suppliers.

It is apparent from the ANOVA test that supply chain characteristics such as the total number of customers, suppliers, number of strategic customers, strategic suppliers, percentage of customer and supplier contacted through E-Commerce and E-documents used significantly vary with the type of operation of the firm.

From the ANOVA test, it is observed that all the items of supply chain characteristics were found to significantly vary with the type of business.

It is known from the ANOVA test that all the items of supply chain characteristics were found to significantly vary with the size of the organisation.

It is identified from the ANOVA test that the total number of customers, carriers, third party logistics providers and the Number of strategic customers, strategic carriers and third party logistics providers, the percentage
of customers contacted through E-Commerce and the e-document used vary with the type of market area served

It is evident from the chi square test that the number of servers, Availability of systems manager or executive (HR), Corporate website, corporate e-mail and SCM adoption is dependent on the area of business or the city where the business is located.

The chi square results reveal that the Number of PCs, Availability of systems manager or executive (HR), use of CRM, SCM and CAD/CAM depends on the type of business.

It is noted from the chi square test that only the availability of systems manager or executive (HR) is significantly dependent on type of ownership.

It is apparent from the chi square test that the number of servers, availability of Corporate Website, Corporate e-mail, use of EDI, LAN, ERP, CRM, SCM and CAD/ CAM depends on the type of operation.

It is observed from the chi square test that except of having email, which does not depend on organisation, all other IT infrastructure depends on the organisation size.

The results of chi square test identified that the availability and number of PCs and Printers, availability of corporate website ad corporate email, use of EDI and ERP depends on the type of market served.

Summary of the results of hypotheses test and the conclusions drawn are presented in the Table 6.1.
<table>
<thead>
<tr>
<th>Hyp No.</th>
<th>Hypothesis Statement</th>
<th>Tests</th>
<th>Result*</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho1</td>
<td>There is no linear relationship between the pressure and business strategy.</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho2</td>
<td>There is no linear relationship between the customer and business strategy</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho3</td>
<td>There is no influence of intensity on business strategy</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho4</td>
<td>There is no linear relationship between the environment and business strategy</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho5</td>
<td>Environment, Pressure, Intensity and Customer will not influence the business strategy</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho6</td>
<td>There is no linear relationship between the IT Strategic Value and business strategy</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho7</td>
<td>There is no influence of pressure on IT Strategic Value</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho8</td>
<td>There is no linear relationship between the customer and IT Strategic Value</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho9</td>
<td>There is no influence of Information Intensity on IT Strategic Value</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho10</td>
<td>There is no linear relationship between the Environment factors and IT strategic value</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho11</td>
<td>Environment, Pressure, Intensity and Customer will not influence the IT strategic value</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
</tbody>
</table>
Table 6.1 (Continued)

<table>
<thead>
<tr>
<th>Hyp No.</th>
<th>Hypothesis Statement</th>
<th>Tests</th>
<th>Result*</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho12</td>
<td>There is no influence of challenges on SCM adoption</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho13</td>
<td>There is no linear relationship between the benefits and SCM adoption</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho14</td>
<td>There is no influence of Business Strategy on SCM adoption</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho15</td>
<td>There is no linear relationship between the IT Strategy and SCM adoption</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho16</td>
<td>Business strategy, IT Strategic Value, Benefits and Challenges will not influence the SCM adoption</td>
<td>Regression</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho17</td>
<td>Business Strategy, IT Strategic Value, E-Commerce Challenges and E-Commerce benefits will not influence the SCM Adoption.</td>
<td>Path Analysis</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho18</td>
<td>There will be no difference in the SCM adoption among the companies serving different markets</td>
<td>Kruskal-Wallis</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho19</td>
<td>There will be no difference in the SCM adoption among the companies of different size.</td>
<td>Kruskal-Wallis</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho20</td>
<td>There will be no difference in the SCM adoption based on the type of operation (Job Work, Manufacturing Supplier and OEM Manufacturer).</td>
<td>Kruskal-Wallis</td>
<td>NS</td>
<td>Accepted</td>
</tr>
<tr>
<td>Hyp No.</td>
<td>Hypothesis Statement</td>
<td>Tests</td>
<td>Result*</td>
<td>Conclusion</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>Ho21</td>
<td>There will be no difference in the SCM adoption among the companies of different ownership type</td>
<td>Kruskal-Wallis</td>
<td>NS</td>
<td>Accepted</td>
</tr>
<tr>
<td>Ho22</td>
<td>There will be no difference in the SCM adoption based on the type of business (Electronic goods, Auto Components and Textiles Machineries)</td>
<td>Kruskal-Wallis</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho23</td>
<td>There will be no difference in the SCM adoption among the companies of different places of business</td>
<td>Kruskal-Wallis</td>
<td>NS</td>
<td>Accepted</td>
</tr>
<tr>
<td>Ho24</td>
<td>The SCM adoption does not vary with the demographic factors such as market served, size, operation, and ownership type, nature of business and city</td>
<td>Kruskal-Wallis</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho25</td>
<td>No difference on the supply chain characteristics will found between the types of ownership</td>
<td>ANOVA</td>
<td>NS</td>
<td>Accepted</td>
</tr>
<tr>
<td>Ho26</td>
<td>There will be no difference in Supply chain characteristics between the cities of business</td>
<td>ANOVA</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho27</td>
<td>There will be no difference in Supply Chain Characteristics on the type of Business</td>
<td>ANOVA</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho28</td>
<td>There will be no difference in Supply Chain Characteristics on the type of Business</td>
<td>ANOVA</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho29</td>
<td>There will be no difference in Supply Chain Characteristics on the size of the organisation</td>
<td>ANOVA</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Hyp No.</td>
<td>Hypothesis Statement</td>
<td>Tests</td>
<td>Result*</td>
<td>Conclusion</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>Ho30</td>
<td>There will be no difference in Supply Chain Characteristics on the market area served</td>
<td>ANOVA</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho31</td>
<td>There will be no difference in Supply Chain characteristics of the firms do not vary with the demographic factors</td>
<td>ANOVA</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho32</td>
<td>There will be no dependence of IT infrastructure on the city</td>
<td>Chi square</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho33</td>
<td>There will be no dependence of IT infrastructure on the type of business</td>
<td>Chi square</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho34</td>
<td>There will be no dependence of IT infrastructure on type of ownership</td>
<td>Chi square</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho35</td>
<td>There will be no dependence of IT infrastructure on the type of operations of the firm</td>
<td>Chi square</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho36</td>
<td>There will be no dependence of IT infrastructure on the size of the firm,</td>
<td>Chi square</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho37</td>
<td>There will be no dependence of IT infrastructure on the market are served</td>
<td>Chi square</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
<tr>
<td>Ho38</td>
<td>There will be no IT infrastructure characteristics do not vary with the demographic factors</td>
<td>Chi square</td>
<td>Sig</td>
<td>Rejected</td>
</tr>
</tbody>
</table>
6.3 SUGGESTIONS

The Indian economy is the tenth biggest in the world for it has the GDP of US$ 1.824 trillion in 2012. The country has the second fastest major growing economy in the whole world for it has the GDP rate of 9.4% in 2006-2007. The manufacturing industries in India still hold importance even with the growth of the service sector and the undeniable agriculture sector (agriculture: 17.2%, industry: 26.4%, services: 56.4% as per 2011 est.). The industrial sector is one of the main sectors that contribute to the Indian GDP. The country ranks eleventh in the factory output in the world. The industrial sector is made up of manufacturing, mining and quarrying, and electricity, water supply, and gas sectors. The industrial sector accounts for over 14% of the total workforce in the country (agriculture: 52%, industry: 14%, services: 34% as per 2009 test.).

Indian manufacturing industry has all the qualities that can enhance economic development, increase the productivity and face competition from the global markets. The importance of the manufacturing sector is not just its contribution to economy, but also in generation of employment. Indian industries are known for its small and medium size purposely to utilize the labour. Due to this reason, the manufacturing industry in India, which is labour intensive, can provide the requisite number of employment units in the country. However, the productivity of the manufacturing industry in India is approximately 1/5th of the productivity in the manufacturing industry of United States of America. It is about ½ as compared to the productivity levels in South Korea as well as Taiwan. Similarly, Exports of manufactured goods from India is less compared to other countries owing to the performance manifested by the export sector. Contribution of India’s export towards international market grew from 05% to 0.7% during 1990 to 2000. During the
same period, Malaysia, China, Thailand and South Korea, registered almost double increase in exports.

India has experienced rapid industrial growth since the enactment of the economic liberalization policies in 1991. Economic liberalization has accounted for a substantial impact on the manufacturing industry through an increase in the presence of manufacturing units, from 98,379 in a pre-liberalization period of 1987 to 1,58,877 during the financial year April 2009-March 2010. This show a rise in the production capacity and output within individual manufacturing facilities.

The impact of the dual growth consequences introduced above, is shown by a consistent 8% compounded annual growth rate of the Index of Industrial Production during the period of the 10th Five Year Plan, 2002 – 2007. This growth has carried forward into the 12th Five Year Plan despite a reduction in 2008-09 owing to the global financial crisis.

In 2011, the National Manufacturing Policy aspired to create 100 million additional jobs in the next 10 years. This aim will be achieved by increasing the Gross Domestic Product (GDP) share of the manufacturing sector from the current level of 16% to 25% by 2025.

The growth of Indian Auto Component Industry in the little over first decade of the 21st Century is phenomenal. The Industry transformed gradually in stages from serving just Indian market – majority to replacement market - to global OEMs and replacement market. The Auto Component Manufacturers Association (ACMA) has significance for global recognition and has an impact on GDP. It has a supporting role in the growth of Indian Automobile Sector and in future as per Automotive Plan 2006-16, Vision 2020:21 and Automotive Sector five year plan (2012 – 17) as projected by Department of Heavy Industry, Ministry of Heavy Industries and Public
Enterprises. The growth of this sub sector has a bearing on the developments and growth of Indian Automobile Industry rather it is dependent on Automobile Industry growth – Locally and worldwide – expanding and aftermarket. This research paper highlights the growth of Indian Auto Component Industry relating with Investments and Foreign Direct Investment (FDI) in Equity inflows, drawing comparison with the developments and growth of Indian Automobile Industry, more specifically to Two Wheelers, Passenger Cars and Commercial Vehicle – Domestic Sales and Export earnings (Bhasker 2013).

With only public sector electronic companies such as Bharat Electronics in the market in 70s and early 80s. later starting of private electronic manufactures such as Wipro and HCL has led to the an incredible growth and expanding the expertise areas beyond the telecom and computing domains to automotive, medical devices, industrial electronics, consumer electronics and of course, mobile devices. The Indian Development Centers of multinational firms and India based service providers have been stepping up their efforts in the recent years. India has seen the overall embedded exports growing at close to 40 percent CAGR for the past 6 years. The success of the product-engineering firms is clearly visible when seeing the contribution they provide to global product engineering. India already has about 100,000 engineers contributing to the global electronic engineering team of about 1 million. India contributes to 10 percent of the global electronic engineering. Domestic electronic product consumption is about 2.5 percent (assuming $25 billion in a trillion dollar industry).

With India supplying innovative products to firms and geographies across the globe, the Indian subcontinent seems to have largely not been impacted by the product innovation cycle. Considering the highly optimized processes and having understood product architecture requirements, the
Indian engineer is more than capable of delivering what is required for the local markets here. In recent years, the pace at which semiconductor and systems companies have established their own design centers in India has accelerated. The design services industry will continue to play a role in India’s emerging semiconductor ecosystem and contributing to the growth for India’s electronics industry (Premji).

Electronics system is becoming more pervasive. People are forced to buy products, which increasingly use electronic devices. This will drive the rapid growth of the electronic goods market in the country, the present electronic goods (systems) market in India is pegged at around $100 billion (approximately Rs 5,00,000 crore). Indian market for electronic products set to quadruple to $400 billion in 2020, it would create a huge opportunity for jobs in the country. Indian design engineers are considered on par with the design engineers in the advanced economies of the world and therefore, there is a big opportunity in India to strengthen the electronic ecosystem in the country by setting up manufacturing units in India. The Indian Semiconductor Association has been lobbying the central Government to invest and start electronics manufacturing units in the country (Gonsalves 2013).

Indian Textile and Apparel industry is the second largest manufacturer in the world with an estimated export value of ~ US$ 34 billion and domestic consumption of ~ US$ 57 billion. The sector contributes to about 6% of the US$ 1.7 trillion Indian economy, 14 % to industrial production, and 17 % to the country’s export earnings. It also provides employment to ~35 million persons directly and ~55 million persons indirectly. India is among the very few countries, which have a presence across the entire supply chain, from natural and synthetic fibers right up to finished goods manufacturing. It has presence in organized mill sector as well as decentralized sectors like handloom, powerloom, silk, etc. The total Indian
consumption of textiles and apparel is estimated at ~US$ 57 billion (apparel retail contributes ~ US$ 40 billion, technical textiles contributes ~ US$ 13 billion and home textiles contributes ~ US$ 4 billion). It is expected to reach ~US $ 100 billion by 2016 growing at a compounded annual rate of 12%. Along with this, the exports have grown from US$ 19 billion to US$ 34 billion in past 6 years at a CAGR of 12%.

With the objective of accelerating growth in investments and exports; Government of India has launched several schemes, a few of them are:

- Technology Upgradation Fund Scheme (TUFS)
- Scheme for Integrated Textile Parks
- Development of Mega Cluster
- Integrated Skill Development Scheme (ISDS)
- Technology Mission on Technical Textiles (TMTT)
- A manufacturer can focus on a large number of business parameters in order to improve the manufacturing competitiveness. However, the most critical parameters having significant impacts are:
  - Skill Upgradation
  - Technology Upgradation
  - Partnerships

There is a huge potential in the apparel market and there are many factors contributing to the boom in this sector. To name a few, increased consumerism with a capacity to spend on luxury items and increased spending power in the hands of Indians. However, the industry has not
performed to its full potential. It faces several challenges in aspects of production, marketing, and support infrastructure. The technology used in manufacturing of textile and apparel in India considerably lags behind that of developed nations and this is mainly due to lack of value addition, low productivity, low pace of modernization, economies of scale and high fragmentation. The industry also suffers due to general infrastructure related issues which lead to higher transaction costs, unreliability in transit times, etc. along with focus on limited markets, weak brand positioning of India and overdependence on cotton (Wazir 2012).

Due to high investments on renovation of plant and machinery in the textile manufacturing industry, the manufacturing of textile machinery, their parts and accessories rose last fiscal by 25 percent to Rs 1,668 crore from Rs 1,341 crore in the previous fiscal. According to the Textile Machinery Manufacturers’ Association of India (TMMAI), the industry also witnessed its capacity of consumption at 55 percent during the year.

But, on the other hand the total projected demand of Rs 4,200 crore of the textile industry, a major contribution was satisfied through imports. This has identified for an urgent requirement on the part of both the user-textile industry and the textile engineering industry (TEI) to start a joint assessment to reverse this movement. This is regardless of the truth that they had to compete with longer delivery schedules from main machinery suppliers. In spite of this, the TEI should make an effort to satisfy the demand in volume/quality and performance with effective after sales service.

Today, Indian industry is extremely fragmented. In the organized spinning sector there are nearly 2300 players with 280 composite mills, There are 1000 weaving units and around 1,45,000 independent processing units and innumerable garment makers. The position of machinery technology is not well apart from the spinning sector. Nearly 0.1million modern shuttleless
looms are needed to set up and to satisfy the target by 2010. Processing sector will also require big amount of up-gradation. It is calculated that a total investment of 35 billion dollar might be needed to achieve the growth intended by ICMF.

Indians have very good engineering capabilities and, that is why, if an industry focuses on innovation, you will have a far greater chance of success, rather than the model which is based on just being a production machine. The technology comes from somewhere and you get everything and you just want to convert it. We cannot be enslaved. We are today slaves in manufacturing. Technology comes from somewhere else; we are like slaves putting it together. We have to be our own masters. The automotive industry has suffered for the past 30-40 years, it is changing now, over the past 8-10 years. But prior to that, there was no Indian-designed car.

Before 2000, we were unable to design a single car; all the cars were designed in Japan, Europe or somewhere else. We were just converting. India is a late starter in the automotive industry, but the moment we started designing our own vehicle, life changed here. We need to do more and more of that in other fields, too. That is the revolution that India needs in the manufacturing space. Without this, the Indian industry won’t grow.

In today’s dynamic business environment, businesses are facing a more complex and competitive environment. The rate at which new products and services reach the market has increased tremendously. Firms now confront a greater number of competitors who put pressure on pricing. The companies need to adopt strategies that ensure the availability of products at the right time, at the right price, at locations nearer to the end user. This requires synchronized concurrent operations by professionals in order to satisfy the expectations of quality- and price-conscious customers. This creates a need for the companies to innovate on the supply chain functions
including Sourcing, Inbound Logistics, Warehousing, Production Scheduling and Planning, Manufacturing, Outbound logistics, distribution, Supplier Tracking, Supplier Risk Management and Information Management.

Shah et al (2002) suggest that strategic initiatives and SCM practices taken by supply chain members require using information intensively. Thus, they require the inter-organizational information system support. Further, they argue that supply chain at different levels of coordination and integration require different level of IS integration. Henceforth, in order to achieve the competitive advantage in Indian FMCG supply chain, a high level of supply chain integration must be aligned with high level of IT integration.

To manage the today’s complex business processes IT is an essential and critical business support infrastructure. Though large number of companies have adopted IT infrastructure studies found that majority of IT systems are transactional systems and the deployment is limited to certain functions like inventory, production planning, accounting and shop floor. Large organisations have adopted enterprise wide business packages to run their day-to-day business processes like procurement, inventory management, dispatch and financial management.

Over the last decade or so, information technology has taken a turn due to the exponential growth of World Wide Web (WWW) that has led to a more flexible and powerful E-Commerce and E-Business system based on the web technologies. This has led to the penetration of sophisticated technologies into small and medium businesses. It has helped in growth of many SMEs and SMBs. In tune with the global trend, Indian SMEs are also adopting the technology at a faster rate. Indian SMEs are willing to invest in new IT solutions to improve their output and efficiency. Over the last couple of years, Indian SMEs have been adopting Enterprise Resource Planning
(ERP), clubbing it with Customer Relationship Management (CRM) and sometimes even with Supply Chain Management (SCM). These small and medium enterprises have realised that to maximise the potential of available information technology, IT products must be implemented in tandem.

Many factors influence the adoption of SCM by the industries. Kwon and Zmud (1987) classified the variables that influence technology adoption into five broad categories: individual, task-related, innovation-related, organizational, and environmental characteristics. Since this study focus on the industry level adoption of SCM, only the organisational and environmental factors are taken for the study. The factors such as information intensity, customer pressure, industry pressure, business environment, business strategy, value of IT etc are hypothesized to have an impact on the SCM adoption.

This study revealed the penetration of IT infrastructure especially the personal computer is high. Similarly, the availability of Internet and use of email is also high. Therefore, the basic requirement is not an hindrance. However, the adoption of SCM is not so prevalent initially because of the size of the organisation. Indian industry mostly has small and medium enterprises. This is the major challenge of SCM adoption. Many a times the small and medium enterprises are subcontractors to a larger company. The relationship between the company and the sub contractor is one to one. Therefore, the job workers and small firms do not have a complex supply chain operation. However, the customer organisations require managing many suppliers and sub contractors and therefore will require SCM software. When the large organisations adopt a particular IT technology, they would like the supply chain partners to connect to it. However, because of the cost of the product the small organisations are not ready to adopt the technology even when their customers force them. Similar problems have been observed in much other
technology among the industry because of the cost. The need of the hour is developing software modules for the smaller companies to connect to their suppliers or developing web based, cloud based and SaaS model of software for more application of IT in business processes. Since the need of integration of supply chain partners and the technology that bridge them is obvious.

The study modelled business environment as a factor that influences the business strategy. The findings are consistent with Galunic and Eisenhardt (1994) who found that in order to succeed; organizations must align changes in the external environment and firm strategy. The model also related environmental factor to the value IT. The study found that there is an influence among these factors. The findings are supported by Bowersox and Daugherty (1995) who found that the realization of increased competitiveness from supply chain integration and the resulting inclusion into overall firm strategy should lead to adoption of sophisticated information technology.

This study proposed that the interorganisational factors such as information intensity, customer relationship and industry pressure influence the business and IT strategy and thereby will influence the adoption of SCM technologies. The result shows the impact of customer relationship and pressures on the SCM adoption. The findings are consistent with previous findings. The implications of the findings can be understood that coercive pressure from supply chain partners can influence adoption of supply chain technology. An organisation, in order to standardize data formats and improves coordination and communication within and between organizations of the supply chain forces other organisation to adopt a similar technology that they are using. Norris (1988) suggested that auto industries are in the forefront in establishing EDI standards and then coerced organizations to adopt technologies to enhance communications and improve productivity.
As not only a coercive pressure, a favourable relationship between the organisation and its supply chain partners can also result in support of adoption of technologies to improve inter organizational coordination and cooperation.

This study developed a model that provides understanding on factors that drive the SCM adoption. This model perhaps provides a key managerial implication. It can be understood that the information intensity, environmental factors, customer pressure and industry pressure are factors that can influence the business strategy of the firm and the value of IT for their business performance. The expanded model also highlights that the awareness of benefits and challenges of SCM in E-Commerce along with the business strategy and IT value will influence the SCM adoption. Managers can make use of this model to gain a better understanding of the different factors influencing SCM adoption. This model helps the managers to take decision on the SCM adoption by considering the major factors in the model and evaluating them in the context of their organisation.

While having a huge growth potential in domestic and international markets, Indian manufacturing industries are having competitive pressures, globalization and complex business partner relationships are forcing organizations to adopt and expand their supply chain management (SCM) systems.

6.4 SCOPE FOR FURTHER RESEARCH

- To study the Opportunities for E-Commerce and Supply Chain Management different states in India.
- To study the E-Commerce better information and related Supply chain management activities.
• To Study the Impact of E-Commerce on organizational performance.

• To Study the E-Commerce and supply chain management in Small scale industries.

• To Study the Electronic markets and infrastructures.

• To Study the Mobile commerce.

• To Study the Integrating Back Office Systems with E-Commerce.

• To Study the SCM Frameworks, Trends and Challenges.

• To Study the World Wide Web and E-Commerce.

• To Study the Supply chain in Food and Service industry.

• To Study the Infrastructure and logistics issues.

• To Study the Supply chain security and risk management.

• To Study the Supply chain risk assessment in emerging markets.

6.5 CONCLUSION

Deloitte (2011) argued that the global industry are moving towards sustainability strategy 2.0 from earlier the earlier version. Susutainability strategy 2.0 mainly focus on the responsibility of the companies in the collective growth within the supply chain partners. This has become a hot and compelling strategy that is being perused by companies and the importance of building relationships with their suppliers and customers are felt.

Efficient partnership in the supply chain has become more reality by the development of recent IT and communication technology that are
flexible and enable easily integration of information, could enhance information flow and facilitate decision-making in supply chain and logistics operations. IT provides many essential applications in improving performance in supply chain. Web based solutions makes the implementation easier and less costly.

With the India’s growth trends and the recent global recession, the industry production growth is directly reflected on the GDP growth. There is an urgent need to sustain the growth momentum that India had before the recession. There is a pressure for attaining a double-digit growth, which will only be possible when Indian manufacturing sector competes with the Multinational companies (MNC) and the foreign companies.

Indian companies can meet most of the challenges with an efficient supply chain strategy. With IT as the key enabler of the supply chain performance, the need to address the adoption challenges of SCM is urgent agenda. This study focused on the factors that influence the SCM adoption. With India’s strength in the software building, the inherent challenge of technology adoption such as organisational size, cost of the product, implementation issues etc need to addressed. Recent technologies such as cloud computing, SaaS etc need to be developed exclusively to address the needs of Indian industries and their unique characteristics and culture.