Chapter 6

Conclusion
6.1 Managerial implications

The managerial implications are discussed in the next three sections. The first section deals with the managerial implications pertaining to the development of service quality scale. The second section deals with the managerial implications of the performance measurement system used in the study. The third section discusses the implications of the relationship between the service quality and performance.

6.1.1 Service Quality of Supply Chain

From the data analysis it can be seen that the factors affecting service quality are more or less the same for upstream as well as downstream supply chain (Fig. 5). In order to enhance the service quality the upstream as well downstream business partners should focus on improvement of accessibility, human factor/empathy, competency, credibility, communication and reliability. The service quality of the supply chain is the service quality of each and every entity in the supply chain. So to enhance the service quality of the supply chain each and every firm has to focus on the factors discussed below.

Accessibility

In order to enhance the accessibility factor, the location of the supply chain partners in the vicinity of the focal firm is desirable. This promotes personal meeting and visits as and when necessary. In case of some technical / commercial problem the supplier/distributor can visit the focal firm or visa- versa. The purchase procedure should be simple and quick. Unnecessary formalities should be avoided. Online procedures and formalities can enhance the speed; reduce the need for physical proximity at times. The online procedures even lend flexibility to the supply chain to an extent. This factor becomes all the more important in case the product design is customized or highly technical requiring frequent involvement of the supplier. If the distributor or downstream partner is easily accessible, the fluctuation in demand and supply can be handled more efficiently. Even the customer service level can be enhanced in terms of delivery time, size variants, model variants, assortments and so on.
**Human factor/ Empathy**

The experience of the firm in transaction with the upstream / downstream personal should be a pleasant one. The front end staff should be well groomed and presentable. They should be good and convincing in communication. The staff should have a positive attitude towards the business partners and should be given proper training for handling discrepancy or problematic issue. The personal interaction that takes place in the business transaction between the two parties is a crucial factor shaping service quality. Even if a single untoward incidence occurs, the bad experience hovers for a very long time and is very difficult to erase. This may not only call for proper recruitment and selection if the front ends personnel but may also require training and grooming the staff on regular basis to deal with the customers.

**Competency**

The upstream and downstream business partners should ensure that they have the right people at work. The firm should have the required knowledge and skill levels in the employees. Due care should be taken while recruiting and training the staff. The infrastructure, machinery and set up required for the business should be maintained in proper condition and renewed timely. The competency level of the firm ensures the right quality to be delivered every time. So the upstream and the downstream partners should be well geared with the right skills, infrastructure and updated technology. Good competency level also reflects the ability of the partner to meet the fluctuations in demand and cope with service levels desired by the customers.

**Credibility**

In the times like this when competition is at all levels, the upstream and downstream business entities should ensure that they meet the delivery requirements timely. Any lacuna here may cause tardiness and delay in the whole supply chain. To meet the timeliness and commitments in the supply chain it is imperative that the upstream and downstream partners have robust system and processes along with lean inventory management, smart finance and proficient IT support.
It is a factor of primary importance in selecting the supply chain partner specially when lead times are getting leaner and the customers are demanding zero tolerance on delivery schedules.

**Communication**

The support service like IT infrastructure and ERP has become a must in today's businesses. If all the business firms of the supply chain are geared and integrated on the same bandwidth than definitely it can enhance the promptness, service levels and cost effectiveness in the supply chains. This is a challenging task though as IT infrastructure development and training has huge financial outlays. The large scale firm may have the latest IT support but the medium and small scale industry are not ready for high investments in IT. Whatever may be the case, IT support can definitely promote service quality and also enhance profitability of the entire supply chain in the long run. The small and medium firms may go for phased upgradation of IT infrastructure.

**Deliverables**

The correctness of orders and reliability in dealings, reinforces trust in business partners. It builds long term relationships in supply chain. Supply chains were the business partners are matured and have liaised for long term show greater understanding for each other and are better aligned towards the common goal of service quality to the end user. The supply chain partners should thus foster relationships for building a long term association. When associations stay over time there develops an understanding and trust which makes work smooth. Partners in supply chain should focus on delivering the correct order everywhere and every time.

There are six (five) dimensions revealed in this study to measure the service quality of supplier (downstream partners) from the focal firm's perspective, namely- Accessibility, Human factor/ Empathy, Competency, Credibility, Reliability and IT infrastructure. The scale may be used for
assessing the service quality of any upstream and downstream supply chain partner and may be
used for improving quality in the supply chain. The managerial implications for this are as follows-

- The scale may be used by managers to evaluate the service quality of the supplier
downstream partner/distributor) on various dimensions. The summation of these factor
score will give the overall service quality of the supplier(downstream partner/ distributor). The scores on individual dimension may help managers to identify the
critical areas for service quality improvement.

- It may be used to monitor the service quality of supplier (downstream partner/
distributor) across time period and see whether the service quality has been maintained,
improved or reduced. The managers may also study service quality trends annually,
quarterly or monthly. Based on the trend movement the supplier/distributor development
programs may be designed.

- Strategic supplier partnership (downstream partner/distributor) is very crucial in building
efficient and cost effective supply chain. While supplier (downstream partner/distributor)
selection, the scale may help in assessment of service quality of various suppliers
(downstream partner/distributor) and in rating them. The supplier (downstream partner/
distributor) that delivers the best service quality may be selected for strategic tie ups.

- The scale may be used for benchmarking supplier (downstream partner/distributor)
service quality and in designing programs and policy for improvement.

- It may be used across various sectors to know about the suppliers (downstream partner/
distributor) service quality trends across various sectors. The scale may further identify
the critical dimensions of service quality in various sectors.

- The scale may be used by the firm to evaluate the service quality of the downstream
partner as well as the service quality of upstream partner. Since the same scale is used for
upstream as well as downstream partners, the service quality delivered by the partners
may be directly compared. This will give important insights about upstream service
quality dimension that may be controlled so that the service quality that flows
downstream may be improved or maintained.
6.1.2 Business Performance of Supply Chain

The performance of any firm may be measured with the BSC (Kaplan & Norton), it gives a balanced picture of the business of the firm as it takes into account the interest of all stakeholders. The data collected for measuring the performance of focal firm was reduced to five factors – Finance, Learning, Marketing, and Competitiveness & Operational. In a standard BSC the marketing and competitiveness factor are extracted as one. The findings of this research differ due to the small sample size, bias in responses and sample not representative of population.

Financial

The efficiency in converting the raw material is reflected through cost based metrics. In organizations, finance is the first and the foremost parameter that is used to assess the health. No matter, the importance of other non cost metrics to assess the performance of business firms is increasing yet it is the financial factor that will always remain primary. Hence all firms in the supply chain should religiously record and assess the financial health of the firm. Financial health reflects the ability of the firm to sustain in the market.

Marketing

The firms should focus on time delivery, customer satisfaction and service quality. Due to growing competition and customer expectation rising any lacuna or delay in serving the customer might result in losing the customer. This will eventually mirror in the performance of the firm. So the customers have to be well taken care of, if the firms have to excel their performance.

Learning

Organizations that are sensitive to changes & innovations, and regularly adopt practices like training and updating their skills are better performers in the business scenario. In a world driven
by innovation, it has become indispensable for very organization to adopt the innovations as quickly as possible. An enabling culture where the employees are also free to suggest improvements and adopt for betterment helps.

**Growth**

Another very important yardstick for measuring the performance of business is the ability of the firm to maintain its customer and market share. Often this factor gets camouflaged due to financial performance of the firm. It is equally important that the firm is able to retain its old market share. Maintaining the market share by losing the old customer and adding new does not give sustainability to the firm in the long run. Besides if the product is competitive then only the customers will be retained, otherwise the firms should have a relook at their offerings.

**Operational**

The organizations should watch out for operational efficiency of conversion cycle. Any kind of waste in the industry results in lower productivity and hence depreciates the performance of the firm. The lower productivity also gets manifested in the financial metrics. Often low productivity gets clubbed with employee turnover and low motivation at work. This vicious circle may be avoided by the firm by investing in training and Kaizens.

The scale used for measuring the performance of the firm comprises of five factors – Finance, Learning, Marketing, Growth & Operational factors. The scale had been used in this study to measure the performance of the focal firm. The scale can be used to measure the performance of business across similar settings. The managerial implications of it are as discussed below-

- The scale can be used to measure the business performance of any firm in the supply chain with respect to the past performance. The summation of the factor scores will give the overall increase or decrease in firm’s performance over the base year. The individual factor scores will help in identifying the area of poor performance so that firms can plan out remedial actions.
• The scale may be used to study the performance of firms across time and see if the performance is maintained, improved or reduced. The managers can study the trends annually, quarterly or monthly. Based on trends movement performance improvement programs may be planned.

• The scale may be used for benchmarking firms on the basis of performance score which may help in designing programs and policy for improvement.

• It may be used across various sectors to know about the performance trends across various sectors. The scale may further identify the critical dimensions of performance in various sectors.

• The scale is designed such that it assesses the performance of the firm from the base year. It is designed in such a way that it seeks only a relative response on all items in terms of increase or decrease from the base year. For any of the item / question an absolute response is not required. This facilitates responses on financial factors which people otherwise have inhibitions sharing.

• The scale can be used to assess the performance of various firms in the supply chain and then can be cumulated to give the performance of entire supply chain. However which firms to consider, what weight ages to be given and how to aggregate the scores into one single supply chain performance index is something that awaits further research.

6.1.3 Upstream and Downstream Service Quality

The number of upstream and the downstream factors are related to each other in the study. It shows that the service quality that builds upstream gets reflected in the downstream supply chain. Any lacuna in the service quality of the upstage will get reflected in all the successive stages of the supply chain. Hence quality should be built upright, right from the point of origin. The service quality factors that have been extracted for upstream and downstream service quality are related to each other.
• Accessibility and Empathy of upstream has an influence on the Accessibility and Empathy of downstream stages of supply chain. Hence due care should be taken up as any lacuna is accessibility or human factor may cause problems in the subsequent stages of the supply chain.

• The IT infrastructure should be well geared and integral across the entire supply chain to reap the benefits of efficiency in the supply chain. There is no benefit of IT if the IT infrastructures of the firms are not integral across the entire supply chain.

• It is important that each and every member in the supply chain have competency to produce the desired output. Any lack of competency at any stage in the supply chain will only add to faultiness in the product. The subsequent stages cannot make up for the lacuna but might at times, even add to the faultiness.

• An efficient supply chain is one which offers highest level of customer service at the lowest cost. This calls for lean and robust supply chain. If all members of the supply chain go for smart inventory management, slim turn over time, lean lead times than perhaps credibility of the supply chain as whole will be high and there will be no shortages, inventory build up or customer queues in the supply chain.

• Reliability of the supply chain is right only and only when the correct product reaches the end user. Any lacuna in the final product may be the result of failure in reliability at any of the stages of the product. If the specifications are not adhered to in the upstages, the problem only gets amplified at later stages in the supply chain. Hence adherence to requirement is must for delivering reliable product to the customer.

6.1.4 Service Quality and Business Performance

The service quality of the upstream supply chain marginally affects the performance of the supply chain. The statistics reveals that the service quality of the upstream supply chain negatively impacts the performance of the focal firm. This aberration in finding may be due to limited sample size and response bias. The sample was majorly collected across small scale units.
which were from organized sector. The responders, barring a few cases were not much educated and lacked managerial acumen. There is a possibility of wrong interpretation of the questionnaire and deliberate responses. So the above findings cannot be generalized. However a more comprehensive research, covering larger sample size and more representative sample is required to draw conclusive observations.

The service quality of downstream supply chain positively impacts the performance of the focal firm. This means that the focal firm while selecting the downstream partner should be careful as any fallacy on the partners end may take away from the firms performance in terms of profit, customers or even market share. The downstream partners should have good accessibility with the focal firm and should also have the right persons with professional skills to talk and negotiate. The downstream firms should have good IT infrastructure and warehousing capacity so that there are no shortages or customer queues. Online ordering and delivery of the product not only makes the service quality high but also affects the performance of the firm. The downstream partners should deliver good service quality as it influences the performance of the firm. The service quality of the downstream partner may be the most important criteria for focal firms to consider for strategic tie ups.

6.2 Supply Chain Classification Matrix

A supply chain classification matrix is made by taking average service quality of supply chain and average BSC of supply chain as two dimensions. The average service quality of supply chain is further classified as poor, average and good based on their score. If score is less than three then the service quality is considered poor; a score between 3 & 4 renders average service quality and a score above 4 means good service quality. Similarly the average business performance of the supply chain is also categorized into two categories based on their scores. Any score less than or equal to 3 meant poor performance of supply chain and any score above 3 meant average performance of supply chain. The matrix below gives the number of supply chains that fall in various quadrants of this matrix. The quadrant wise analysis gives some important insights to the management which is discussed below. The first column is not taken for
analysis since the frequency distribution is very low. Thus the remaining 4 quadrants are taken for analysis in cyclic order (figure 6.1).

<table>
<thead>
<tr>
<th>AVGBSCSC</th>
<th>AVGSQSC</th>
<th>≤ 3 (POOR)</th>
<th>3-4 (AVERAGE)</th>
<th>≥ 4 (GOOD)</th>
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<td>55</td>
<td></td>
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<td>(4 AU, 27 EN, 12 CD, 16 PL, 5 PH)</td>
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<td>(6 AU, 2 EN, 2 CD, 3 PL)</td>
<td>(5 AU, 4 EN, 1 CD, 1 PL, 2 PH)</td>
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</tbody>
</table>

AU-automobile, EN- engineering, CD- consumer durable, PL- plastic & packaging, PH-pharma

Figure 6.1: Supply Chain Classification Matrix

SQ Average and BSC Poor

There are 64 supply chains that are falling in this category. A closer sector wise scrutiny reveals 27 supply chains are from engineering, 16 from plastic & packaging, 12 from consumer durable, 5 from pharma and 4 from automobile sector. Since the service quality that they are delivering is average, the same is being reflected in the performance of the supply chain. Managers of various firms in these supply chains should concentrate on improving service quality. The firms since most of them are from small scale sectors, which are not very well organized, lack strategic alignment. The managers of such firm should not think local but should think in terms for optimization of supply chain as a whole. The engineering concerns may immediately take the lessons and start working on long term partnership, training of staff, vendor development practices, and distributor tie ups arrangements. They should organize frequent meets with the stakeholder, discuss problems and trouble shoots them jointly. Practices like employee involvement, kaizen, participative management and decision making with consensus could be
very helpful in enhancing the service quality of supply chain as a whole. The supply chains of consumer durable and plastic & packaging need also to get in the above footsteps. Since most of the units have small investment and financial problems, they may start with internal practices like Kaizen, worker participation, in house training etc to develop sensitivity towards service quality.

SQ Good and BSC Poor

There are around 55 supply chains falling in this category. The sector wise break up is – 17 from pharma, 15 from engineering, 8 from plastic & packaging, 8 from consumer durable and 7 from automobile. In spite of good service quality being delivered, the overall performance of the supply chains was not good. There could be many reasons behind this finding. There is a possibility of response bias in data collection. The responders form pharma supply chains as they have to be very conscious of service quality, they might have over rated it. Besides in pharma industry the requirement of service quality is very stringent, so obviously the service quality that they provide is rated high. But providing good quality may be there basic requirement to do business, it might not necessarily mean that the supply chain performance is also good. May be for enhancing the performance they have to further enhance the service quality in terms of empathy, accessibility and IT infrastructure and credibility. The pharma and engineering sector are reliable and competent enough as far is these dimensions of service quality are concerned. The accessibility part can be enhanced further by making procedures quick and simple and by selecting a strategic location for business. IT infrastructure is very necessary today to do business globally. It exposes the firms to business opportunity globally. Thus supply chains should be equipped with right IT infrastructure. Credibility can be enhanced in the supply chain by sticking to commitment and honoring one’s own verdict.

SQ Average and BSC Average

There are 13 supply chains in this quadrant. The sector break up is – 6 from automobile, 2 from engineering, 2 from consumer durable, 3 plastic & packaging) The service quality delivered is
average and also the performance of supply chain is average. But this is not a complaisant situation for the managers to relax. Mediocrity no longer pays in the long run. In order to sustain and grow, the supply chains cannot just provide average service quality. The service quality needs to be enhanced so that the performance of the supply chains is also pulled up. Not many supply chains are in this category but still these supply chains should also strive to excel. In this era of globalization, it is imperative that supply chains equip themselves with commensurate IT infrastructure. This will expose the supply chain to global opportunity, they may think of strategic tie ups and alliances. Further adherence to practices like Kaizen, employee training, participative management, decision making by consensus etc will help a long way in building s credibility, competence and trustworthiness in the supply chain. When the supply chains are imbued with such virtues, the performance of the supply chain will also ameliorate.

SQ Good BSC Average

There are 13 supply chains in this quadrant. The sector wise break up is – 5 from automobile, 4 from engineering, 1 from consumer durable, 1 from plastic & packaging, 2 from pharma. In spite of providing good service quality in the supply chain the performance of the supply chain is average. One of the foremost reasons that could be accorded to it, is the lacuna in data collection in terms of response bias, tendency to deflate performance and inflate service quality, over simplistic model of supply chain. The supply chains can further work towards delivering excellent service quality. They may go for proper IT infrastructure to gear with global partners, think of strategic alliance, out sourcing and building core competency, Building an enabling culture in the organization based on employee involvement, continuous improvement, participative decision making will go a long way in building trust and competency in the supply chain. All these will definitely enhance the performance and give global sustainability to the supply chain. Given to the highly competitive business scenario it is very important that supply chain players think in terms of survival and sustainability in the long term beyond just financial numbers.
6.3 Conclusion, limitations and scope for future research

The study has identified factors to evaluate the service quality of upstream and downstream partner of focal firm. Accessibility, Human factor/Empathy, Competency, Credibility, IT infrastructure and Reliability have emerged out as determinants of upstream and downstream service quality. The scale may be used by industry practitioners to measure and enhance service quality of supply chain partners. The uniqueness of the scale is that it may be used by any of the supply chain entity to measure the service quality of its immediate upstream partner or downstream partner. The service quality of the entire supply chain may be computed as an aggregate index of the service quality of all firms that constitute the supply chain. The service quality has been studied across the various industry sectors/ sizes and the differences that exist have been reported. Hence objective 1 and 2 of the research proposal have been achieved. The relationship between the upstream and downstream service quality factors that has been found has been reported and discussed. This leads to the objective 4 being attended.

Similarly the business performance of the focal firm is measured using the BSC (Kaplan & Norton, 1995). The performance of the entire supply chain may also be computed as an aggregate index of the performance of all the member firms that constitute the supply chain. The performance of the focal firm is studied across various sectors and sizes, the findings have been reported. The objective 3 of the proposal has been attended.

The relationship between the upstream and downstream service quality factors and business performance of the supply chain has been studied. The findings have been discussed and reported. The objective 5 is thus being attended.

The overall service quality of the supply chain is computed and also the overall performance of supply chain is computed. The two aggregates are then studies to find the influence of service quality on supply chain performance using suitable statistics. The performance of the supply chain shows a positive impact of downstream service quality and a negative impact of the upstream service quality. The reasons for these findings have been reported. This lends to the achievement of objective 6.
Service quality of supply chain is relatively an unexplored area with immense potential for further research. It has a number of challenges in terms of isolating and defining a single supply chain, developing and designing suitable constructs to measure the service quality of the supply chain, establishing relationships between these gaps and so on. Relating the service quality to the overall performance of supply chain is another fertile area for research. This solicits research to define framework, constructs, research methodology to measure and evaluate performance of the supply chain as a whole. The two domains may then be linked to find out the service quality of entire supply chain and link it to business performance of entire supply chain.

The data was collected across 150 focal firms across one of the commercial hubs of the country, which is too small a sample to come to any generalization. A cross-sectional study spanning across a wider area and covering a larger population may be carried out to draw more profound results.

A sector-wise study with more number of samples may be taken up to draw sector-specific results. The current study is limited to only a few industrial sectors; more comprehensive study covering various industrial sectors may be undertaken. On similar lines, the study may also be conducted across large medium and small industries with larger sample size. A comparative study sector-wise and region-wise may also be conducted for more conclusive results.

In this study the manufacturing firm was taken as the focal firm and upstream and downstream partners were evaluated from focal firm's perspective. Similar study may be conducted across the entire length of supply chain considering any member of the supply chain as focal firm. Researchers may consider the first tier supplier as focal firm or move down the supply chain and consider the first tier distributor as focal firm.

The data is reduced using factor reduction and factors are compared for upstream and downstream supply chain. Item to item comparison may also be carried out for a detailed study across supply chain. Research may be conducted to study all the gaps of the entire supply chain. These gaps may then be studied to find out if any relationship exists between these gaps. This may require a suitable methodology to first identify and isolate a supply chain with a definite start and end point.
The items considered for designing the scale are based on literature review and expert opinion. The scale may be administered on larger population with more heterogeneous sample to check its reliability and validity.

The impact of this service quality gap in the supply chain may be related to the performance of the supply chain. This again requires the researchers to suggest some suitable methodology to study the performance of the supply chain and link it to service quality of supply chain. A two pronged research is required, one to study the service quality of the entire supply chain and the other to study the performance of the entire supply chain. Further link between performance and