CHAPTER 5

CONCLUSION

This chapter focuses on the specific research questions addressed earlier. It highlights the significant findings of the study. The important contributions of this study are also discussed. Finally, at the end of this chapter suggestions for future research are presented.

The study on TQM implementation was carried out among auto component manufacturers. The perceived level TQM implementation was ascertained through critical success factors, which had been empirically identified and established by many previous researchers. The identified critical success factors were validated to ascertain their applicability to Indian auto component industry and were found to have a good fit in the model.

5.1 SIGNIFICANT FINDINGS OF THE STUDY

Significant findings emerged out of this study, indicating TQM implementation among certified and non-certified auto component manufacturers.

5.1.1 Critical success factors of TQM in certified and non-certified companies

The respondents in certified companies perceived supplier Quality Management as the most important enabler of TQM implementation. The
emphasis on supplier management can be attributed to the intent of the QS 9000 standard itself. On the other hand, strategic planning was perceived to be of least importance. This is in contrast to previous studies where integration of quality process with strategic planning process is said to be the key to successful quality management systems Kanegsberg (1996), Dana Johnson (2002).

In the case of non–certified companies, Benchmarking was seen as the important enabler followed second by Top management leadership and commitment. Quality measurement is perceived to be of least importance in non-certified companies.

In certified companies, Supplier relationship was perceived as the most important outcome of TQM implementation. But they did not perceive operational performance as an important outcome. Non-certified companies perceived supplier relationship as the least important outcome of TQM.

5.1.2 Relationship between the critical success factors

All the critical success factors are significantly correlated with each other. The correlations among all the critical success factors being positive indicate that the quality management strategies should be implemented holistically rather than a piecemeal Ahire et al (1996).

The type (positive / negative) and extent of relationship between the critical success factors and the outcomes of TQM of this study differ from some of the previous research studies. One of the reasons for this difference in opinion is that the studies use different survey instruments and performance measures in surveys across different industries. However, these differences do suggest that the importance of TQM factors may be contingent upon such
factors as the industry environment, firm size, and country of origin of companies.

5.1.3 Role of QS 9000 in a firm’s TQM journey

Analysis was performed to understand if there was any difference in the level of TQM implementation before and after QS 9000 certification. It was observed that there was significant difference in all the critical success factors and results. This re-establishes the fact that TQM is a wholistic approach and cannot be implemented in piecemeal. QS 9000 may be treated as a stepping stone to implement the TQM philosophy in the case of the automotive industry. (Jeffrey Lo Chi Fong et al (2001).

Among the critical success factors, QS 9000 certification had maximum impact on how suppliers are managed; with Supplier quality management having the highest mean difference value. This focus on supplier management can be attributed to the intent of the QS 9000 standard.

QS 9000 certification has a significant impact on all the outcomes of TQM considered for this study. The major area of improvement is the supplier satisfaction, with a mean difference value (2.82). Certified companies have started to have a small number of high quality suppliers who deliver consistent quality and are treated as partners in business.

5.1.4 Perceived level of TQM implementation in certified and non-certified companies

TQM implementation in certified and non-certified companies was analysed, in order to understand how the respondents perceived the critical success factors and outcomes. The independent sample T test scores revealed
that all the variables, that is the critical success factors and the outcomes were significantly different in certified and non-certified companies.

The mean scores of two groups on all the variables, that is, critical success factors and outcomes were compared. Among the critical success factors, supplier quality management had the highest mean difference. Certified companies had a small number of high quality suppliers who are treated as business partners.

Among the outcomes of TQM, Supplier relationship has the highest mean difference value. This can be attributed to the focus of QS 9000 certified companies on building qualified and reliable suppliers.

5.1.5 **Relationship between critical success factors and outcomes**

There is strong evidence that the critical success factors domain and the outcome domain are strongly associated. This result confirms several conclusions drawn by other studies. This result confirms several conclusions drawn by other studies which identify the existence of positive correlations between some critical success factors and outcome criteria (Eskildsen and Kanji 1998; Prabhu et al. 2000).

5.1.6 **Influence of demographics on perceived level of TQM implementation**

ISO 14001 certification is one moderating variable that has significant influence on many critical success factors, benchmarking, product design and operational performance. There is synergy between an environment management system and a Quality management system because of similar criterion, both are integral part of an organisation’s overall
Among the outcomes of TQM, Operational performance is influenced by ISO 14001 certification. EMS is identified as a potential factor in the enhancement of financial performance and competitiveness of the firm. Customer focus has a strong relationship with company size. Smaller companies perceived customer focus as an important critical success factor of TQM than medium and large companies.

Larger companies perceive supplier relationship as an important outcome of TQM as compared to medium and smaller companies. Companies, which had a PPM level of 100 to 500, perceived supplier satisfaction as an important outcome of TQM. The average defect rate in India is in the range of 1000-2000 PPM (A.T, Kearney). Majority of the companies in this study, both certified and non certified had a PPM level of more than 1000.

Therefore, as far as leadership is concerned, companies need to seek such qualities in their top leaders and supervisors that embrace the organization’s focus on quality and assume responsibility for quality and change in all aspects of management including strategic planning.

Also the respondents feel that the top management is not playing an effective role in handling human resources. The study also underscores the necessity of building and leading organizational competencies in the area of human resource management. This factor has a very high effect on effective use of human resource practices in designing and developing new products and services and managing processes.
5.2 SIGNIFICANT CONTRIBUTIONS OF THE STUDY

With the quality revolution sweeping the entire world, TQM remains a potential area of research. This study strives to offer a comprehensive and yet simple methodology for scientifically examining how the plethora of philosophies, precepts, concepts and practices involved in TQM can be structured into a systematic framework for the development of an empirical understanding of TQM in auto component industry.

5.2.1 Implications of the research for management theory and practice

The implications for management theory and practice include the following:

- The study has identified a comprehensive list of TQM critical success factors addressing all the facets of TQM in auto component manufacturing companies (such as production and delivery, design and operations, information technology, industrial relations and corporate citizenship behaviour). The empirical validation of this instrument for measurement of TQM CSFs strives to enrich the subject of TQM.

- A holistic model for TQM portraying the relationships among its dimensions has also been proposed. This effort provides a systematic framework for a conceptual and empirical discernment of TQM and its critical success factors.

- Decision makers to measure the level of TQM implementation in the various auto component-manufacturing units can effectively use the TQM instrument. The level of the critical
success factors would offer key information on the different quality management practices that have to be altered to enhance the business performance with respect to quality.

- The research work attempts to add to available on quality management with respect to developing economies. Such studies in different economies help researchers and practitioners to better understand the intricacies and relevance of the various aspects of TQM across different cultures.

5.3 LIMITATIONS OF THE STUDY

- This study has some limitations which may be considered for future research. This study was a cross-sectional study in auto component industry. Cross-sectional data analysis cannot confirm the direction of causality implied in the research model. Cross-sectional study can only help to investigate the correlation between the variables, not the direction of causation (Bullock et al., 1994) and (Tabachnick and Fidell, 1996). The term causal is often used in this study to describe the relationship among TQM factors and between the factors and performance measures. The biggest limitation of such studies is their inability to meet all the basic three requirements needed to establish causality Ismail Sila et.al., (2001). The three basic requirements are:
  - Association between the two variables (that is the two variables must be correlated)
  - Isolation of the effect (that is, ruling out extraneous variables)
Temporal Ordering (that is, a cause must be shown to unambiguously precede an effect) Bullock et al 1994.

This study used various statistical techniques to establish causality met the first requirement. However second requirement was met by few variables and none met the last requirement. Longitudinal studies must be conducted to establish temporal ordering.

- Although the survey results were derived from a single industry, that is the Indian auto component industry, the study was restricted to companies in and around Chennai. Future research may collect data from other regions or auto clusters, Pune and NCR. In order to improve external validity of the instrument, additional studies would be needed, with increased sample sizes, geographical diversity, organisation type and so on.

- The findings are based on the use of self-reported survey data, which may be affected by response biases.

- It is also important that other major constructs related to TQM implementation process (including communication, employee participation, degree of empowerment) should be added to the conceptual framework underlying this study.

5.4 SCOPE FOR FUTURE RESEARCH

The critical success factors and the outcomes in this study specifically in certified companies focussed more on managing and building better relationship with the suppliers. The intent of QS 9000/TS 19649 is also
to create a quality supply chain. Studies can be carried out to explore the
different strategies in the auto component industry for supply chain
management. Further investigation can be done as to whether being non
certified in QS 9000 is the reason for giving less importance to supplier
relationship.

The possible existence of second-order relationship among some of
the constructs, can be empirically tested as a future research study. It can be
ascertained whether a set of critical success factors load on an overall
construct that may be termed “total quality management” (TQM).

It is proposed that future research be conducted in other types of
organisations such as service and other manufacturing sectors, using a similar
approach.

Investigation needs to be done specifically in auto industry to
understand the impact of TQM implementation on operational performance.

New studies can be conducted to explore the relationship between
the variables within the context of the country, location factors, culture, firm
and industry type and other external and internal factors.

Therefore, further research is needed to explore the underlying
causes that bring about different performance results in different
environments and to understand whether the TQM factors’ degree of
importance differ from one environment to another.