CHAPTER 6

CONCLUSION

During the past few decades, the world has gone through a series of economic changes. These changes have reformed many economic policies. The impact of this reformation headway has been felt in every sector of the global economy, including manufacturing sector. The significant change in the global manufacturing sector is the quality revolution.

Today, businesses are realising that they have to provide high quality products and services at a competitive price in order to compete in the global market. This has resulted in an upsurge in the evolution of new approaches to attain quality. Total quality management (TQM) is one such approach. Today, total quality management is both a manufacturing philosophy and a key factor in gaining competitive advantage.

The rationale behind undertaking this research was to study the extent of current practices of ISO 9001:2000 clauses and their effect on organisational changes, the extent of implementation of total quality management practices and its impact on quality performance, the effectiveness of TQM practices in tyre industry on cost of quality, application of quality improvement tools and
to investigate the barriers to successful implementation of TQM practices in Indian tyre industry.

The study began with an extensive literature survey as presented in chapter three, on motives for ISO 9000 certification, its effects towards infusing TQM, total quality management practices and its implementation in manufacturing sector and cost of quality. Literature related to quality improvement tools and barriers for implementation to TQM was also reviewed.

Chapter one presented the introduction for the study, a scenario on Indian tyre industry and the need for the present study. Objectives and hypotheses were also presented. Methodology for the study consists of research models, research instrument, reliability and validity of the instrument, data collection and analysis were discussed under this chapter. Chapter two discussed the meaning of quality, ISO 9000 and quality management system, the concept of TQM, definitions, philosophies of quality gurus, awards of TQM, cost of quality, quality improvement tools and barriers to implementation of TQM.

variables. Cost of quality data were analysed, quality improvement tools and barriers to implementation of TQM were presented.

6.1 Findings of the Study

The major findings drawn from this study is that the motives for ISO 9000 certification are particularly significant for its real contribution, since it was proved that they influence both the companies’ performance improvement on total quality management issues and their overall benefits from certification. The research showed that the true motives for ISO 9001:2000 certification is to focus mainly on up gradation of product, service and increase the market share. The findings of the study are found to be more positive in strengthening the quality management system in Indian tyre industry followed by improve company quality image and integrating ISO 9001:2000 with TQM.

It was found that the extent of current practices of ISO 9001:2000 clauses is high in tyre industry. However, there exists a small disproportion in practicing the ISO 9001:2000 clauses. In order to strengthen the implementation of ISO 9001:2000, the certified companies should provide adequate resources and assign clearly
defined authority and responsibility to senior executives for its implementation.

Quality management system should emphasise more on defining and documenting the requirements for quality that will be met through quality plans and define and document how the needs and requirements for quality will be met through quality control, inspection and testing. The certified companies should also emphasise more in defining and documenting the procedures used to amend contracts and communicate the changes internally.

In case of design control a formal reviews of design results should be planned properly and conducted accurately. The study indicates that there is a shortcoming in ensuring the availability of documents and in providing a tracking procedure for revision and revival of any changes by same functional department. The study results show that the certified companies lack in ensuring a well documented procedure for selection and development of suppliers. Though the certified companies have achieved a greater excellence in maintaining documented procedure, inspection and testing within their own premises, but they have failed in exercising their managerial excellence at the supplier’s premises.

The study found that the ISO requires the management to establish procedures to control calibrate and maintain equipment at regular intervals which is used to
demonstrate conformance to the requirements. In case of control of non-conforming products, the certified companies lack in adopting better practices in reviewing, reworking and rejecting the non-conforming products. The study revealed that the corrective and preventive actions for removal of non-conformities have been inadequate.

The study also revealed that the procedural steps followed in order to prevent the damage or deterioration during handling, storage and packaging to ensure conformance to specific needs of quality of products seems to be inadequate. It was found that the certified companies lacks in establishing and maintaining a system of internal audits to verify compliance of its activities with the requirements and provide a feedback to the top management about its effectiveness.

The study investigates a lacuna in establishing and maintaining documented procedures and in identifying the training needs, provide training for all the employees performing the activities that affect the overall quality management system. The study revealed that the system should identify proper statistical techniques which can be used to control processes, products and services.

The study showed that the extent of the current practices of ISO 9001:2000 clauses is positively and significantly related to organisational changes (effects). It resulted in clearly defined
responsibilities and obligations, increase in confidence in quality management systems, better system of training & education, better relationship with existing & potential customers and with suppliers.

Top management commitment is prerequisite for effective and successful implementation of total quality management. The investigation into the dimensions of total quality management in tyre industry revealed that the leadership dimension shows that the predisposition of senior management commitment towards continuous demonstration and reinforcing the organisational vision, mission and values to guide the ongoing decision making process is at a higher extent. The study revealed that, there is a real shift in focus of power by the top management. This shift in power has created a work environment that had helped employees to do their jobs effectively. The study shows that a highly committed senior management encourages in learning, allocating resources and enables employees to participate in quality improvement activities. Customer focus and support on long-term quality improvement process is found to be significant by the top management. This shows that an increase in leadership will tend to increase in customer focus, which in turn will increase desired customer satisfaction. An increase in desired customer satisfaction will tend to increase the company specific
business results. However, the study shows that there is a drawback among the senior management in sharing the information about the organisation and in discharging the social responsibilities.

The study revealed that the business plans for quality are developed in-line with organisation’s mission and values, and collects the key performance measures and indicators to review, update and improve strategic plans among the tyre industry. But when it comes to the development and implementation of specific long-term as well as short-term business plans for achieving strategic objectives the study shows a lacuna in the tyre industry.

The study found that the tyre manufacturing companies give more emphasis in identifying and understanding the perception of the emerging customer’s needs, requirements and expectations on a continuous basis and also understands the perception of customers in order to meet their needs and expectations. The study also revealed that the customer satisfaction is determined by a feedback mechanism and the same is translated to maintain and improve quality. The study results shows that the evaluations and improvements in service standards with respect to the speed, courtesy, competence, easy of repair to the customers, building a long-term relationship with the customers is significantly low. The study revealed that the companies
have benchmarked the customer needs, requirements, expectations and satisfaction relative to competitors.

The study shows that the companies have been collecting the information regarding customers, markets, productivity, defect levels and comparative data of products, services and operations by benchmarking and competitive comparisons. But the study depicts that the information collected are not integrated, utilised and analysed to support the organisations decision-making, analysing the process in an effective manner. Though the study revealed that the information and data are collected the system does not ensure its availability for planning and improving performance. Another draw-back in this study is the system lacks in sharing of data and information related to quality and operational performance with the employees.

The study revealed that the human resource focus, though practiced to a considerable extent, compared to the other TQM dimensions, it seems to be comparatively at the lower side. Though the industry develops the human resources to the fullest potential in order to pursue the company’s quality and operational performance objectives, it lacks in empowering the employees to meet the organisational performance and quality objectives, encouraging the employee’s involvement for personal and organisational growth and to create an environment for
quality excellence. The study also revealed that the system lacks in recognition and reward system, assessing social responsibilities and employee motivation and career development.

The study shows that the identification and evaluation of key processes and its impact on business has been done. In order to prioritise the process improvement, it lacks in collecting the information from employees, customers, suppliers, stakeholders, competitors and society. The results of the study show a draw-back in systematically managing the process, system standards and environment to resolve the interface issues. The study revealed that in order to improve process capability and product characterisation, the system uses statistical techniques to establish control to ensure predicted results, process changes have been identified and controlled for its implementation.

Though there are few draw-backs in the system, the study found that the extent of TQM practices is higher. The study revealed that higher the extent of TQM practices has led to higher level of quality awareness, employee morale and teamwork and lower level of scrap & defect levels, customer complaints and cost of quality. The quality awareness, employee morale and team work are positively and significantly related TQM dimensions and scrap & defect levels, customer complaints and cost of
quality are negatively and significantly related TQM dimensions. Thus proving the hypotheses (H₂) to (H₇).

The study revealed that the cost of nonconformance constitutes a high proportion in cost of quality than cost of conformance. In cost of nonconformance, external failure cost constitutes high proportion than internal failure cost. The study has shown that due to ISO 9001:2000 certification and TQM implementation there has been a reduction in internal failure cost. The inverse relationship between cost of nonconformance and cost of conformance shows that there is scope for significant reduction in cost of quality by investing in prevention and appraisal cost. The study revealed cost of quality as percentage of marketable value of production has reduced.

The study also observed that, among the standard 7QC tools, control charts, flowchart, histogram, Pareto analysis and cause and effects analysis are commonly used tools along with stratification and scatter diagram in most of the responding organisations. Sophisticated tools like PDCA, FEMA, QFD and JIT are more or less equally used along with the other simple tools. Critical path analysis and Taguchi method are not as popular as other tools. Advanced Product Quality Planning (APQP) is one technique used in most of the processes.

Acquiring knowledge of more sophisticated tools has been difficult and it is more easy to use simple quality
improvement tools. Lack of resources being the main hindrance in using the quality improvement tools, followed by understanding of quality tools and its uniqueness in adopting.

The study has revealed that lack of resources is the main barrier for implementation of total quality management practices followed by lack of continuous training and education, economic recession, communication, lack of quality infrastructure, lack of commitment of top management and measuring quality.

6.2 SUGGESTION FOR PRACTICE

Based on the above findings, the following suggestions could be made for effective implementation of total quality management in tyre manufacturing companies:

The overall benefits the organisations gain from the standard are related to the reason which initiated the drive for the certification. Irrespective of the motives, the organisations should give awareness about the quality initiative programmes.

Today ISO 9000 seems to be an indisputable fact and a powerful instrument. However, some of the issues regarding standards and certification must be looked at in order to make the system more effective in quality improvement in Indian tyre industry. Looking at the
scenario of growth of the certified companies upgrading their standards in par with the international standards, the organisation should provide adequate resources for its implementation. Clearly defined authority and responsibility to the senior executives should be assigned for an effective implementation.

Though the documentation process in ISO 9000 is a monotonous process, the certified companies should emphasis more in defining and documenting the procedures and the amendments should be effectively communicated.

Design is crucial to the quality of an end-product. The study recommends a well established organisational structure with clearly defined responsibilities for an effective control of design and development, tracking procedure for revision and revival of any changes by the same functional department.

To ensure sustenance and growth the organisations should adopt better practices in reviewing, reworking and rejecting the non-conforming products, corrective and preventive actions for removal of non-conformities. The certified companies should investigate cause of non-conformance and take action to prevent them from reoccurring in future and review the quality management system at regular intervals.

All certified and non-certified tyre companies have suppliers to provide products and services to their
customers. The product so purchased, directly or indirectly have impact on the quality of the end-product. As the managerial excellence have failed in the supplier’s premises, the study suggest a proper control on the purchasing activity in order to ensure that all products and services obtained from external agencies shall fully meet its requirements. Another clause need to be stressed is handling, storage and packaging. A proper establishment and maintaining of internal audit system should be enforced to verify the compliances with the requirements in order to give an effective feedback to the top management.

Nothing is predictable in this changing world, but one thing is certain i.e. change. Necessary adaptations have to be made keeping an eye to the future. Tyre industry must make continuous improvement to keep-up an ideal TQM progress putting more efforts than what is being made in the present, in the area of training and development. Training should be geared towards developing and improving specific knowledge and skills. The TQM environment requires that all layers and levels in the organisation should gain additional capabilities to improve the process and perform the work. The study suggests, to establish a systematic training and development program to meet the organisations goal and to progress towards continuous improvement. In this
contemporary world personal and team interaction skills must be continually refined. More stress should be given to train the personnel in identify proper statistical techniques which can be used to control processes, products and services. Specialised training on sophisticated tools like SPC, FMEA, MSA, CPA and on other problem solving techniques should be given with a adequate resource mobilisation. It is imperative to benchmark training process with world class organisations. A comprehensive training program is necessary to create and maintain the continuous improvement and must be institutionalised within the tyre manufacturing companies.

Effective leadership modulates the implementation of total quality management. However, quality management movement will be rendered unsuccessful if there is inadequate dissemination of information form the top management. Sharing of information about the organisation related to operational, strategy related issue, financial or any inter-departmental information has to be disseminated among the employees. The study suggests a proper channel for information flow throughout the organisation to espouse the improvement process effectively.

A successful TQM implementation requires extra-role behaviour with human resources focus. The tyre industry
should harness human resource to achieve business excellence. For this the study suggests a need to shift in the focal point by empowering the employees to meet the organisational performance and quality objectives. The difference among the individuals is the primary source of creativity and innovation that leads to a major competitive advantage. Employee involvement shall be made effective by involving employees from all levels in team work, by linking cross-functional teams to disseminate and share information. Thus the tyre industry should involve employees by creating an environment for personal and organisation’s growth as well as in gaining the competitive advantage.

Rewards and recognition must be instituted to support the TQM implementation. These should foster the TQM movement among the tyre manufacturers. Optimal utilisation of human resource is possible be proper employee motivation and career development programmes. The organisations should maintain a safe work environment by continuously improving the potentially unsafe areas, assess societal responsibilities by creating an ambience of environmental friendly and implement energy conservations methods.

Customer evaluations and improvements in service standards should be given a due precedence in terms of
speed, courtesy, competence, easy of repair in creating long term relationship with the customers.

A proper cost of quality measurement system has to be installed for the companies to be more proactive and pinpoint the causes for the problems, categorise them into priorities in lieu of continuous improvement. Traditional way of cost accounting system does not work in the long run to meet the quality improvements.

Successful usage of quality improvements tools depends on the awareness about tools and techniques. A proper structured approach and continuous support by the top management has to be made in adoption of quality improvement tools in achieving higher levels of quality products and services.

Sufficient resources has to be made available to drive TQM activities and instigate training programs proves to be one factor in implementation of TQM practices in Indian tyre industry.

An enhanced communication channel has to espouse the improvement process. A well streamlined system for dissemination of information has to be incorporated more effectively for the implementation of TQM practices.
6.3 SUGGESTION FOR RESEARCH

The future research studies may look into the details of extent of practices of QS-9000, TS 16949 certifications and environmental standards, for the implementation of TQM practices effectively. Cost of quality being the key measurement of quality in tyre manufacturing industry, in-depth study can be carried out. Further the research may confine to a single tyre manufacturing company for a longitudinal study of effects of TQM implementation on longitudinal basis.