CONCLUSIONS AND SUGGESTIONS

In the field of total quality management, confusion arose worldwide with the scope of TQM concept and the effects of TQM implementation. In fact, much research dealing with the concept of TQM has been conducted. Researchers have adopted different definitions of TQM; thus far, it has come to mean different things to different people.

After survey of literature related to TQM implementation in Indian manufacturing firms, it became evident that no case study research dealing with the implementation of TQM in automotive industry had been systematically conducted. Thus, conducting a case study research on TQM implementation in automotive industry is timely and fills the research gap. The major objectives of this study were:

- To assess benefits of TQM in the selected firms.
- To identify critical success factors in TQM implementation.
- To identify barrier factors in TQM implementation.
- To list the similarities in approaches to TQM implementation.
- To evaluate the differences in approaches to TQM implementation

This study started with an extensive review of literature about quality and its concepts, quality gurus, TQM tools and techniques, the quality award models, implementation of TQM and research that has been carried out in the field of TQM.

In order to fulfill the research objectives, the following methods for collecting data were adopted: survey, structured interview, documentation and observation. Each of the companies is treated as unit of analysis. First, a within-case analysis is performed followed by a cross-case analysis to identify similarities and differences between the cases in approach to TQM.

Both quantitative and qualitative data is collected. The quantitative research involved gathering information from the seven automotive or automotive component companies which have implemented or in the process of implementing TQM. The survey questionnaire aimed at identifying and stratifying the critical success and barrier factors.
during the implementation of TQM and benefits achieved as a result of implementation of TQM as perceived by respondents from the selected firms. The qualitative research involved interviews and documents collected from the companies. In this level more insights concerning the tools and techniques to implement TQM were presented based on discussing the experiences of seven case study organizations.

One of the objectives of this research was identifying the success factors for implementing TQM. Based on the result of this research the most important success factors which are common for the all case companies are: Upper management commitment and involvement, developing employee involvement, achieving positive change, improving quality, quality training, use of quality tools, teamwork and increasing customer orientation.

The other objective of research was identifying the barrier factors during the implementation of TQM. The major barrier factors which are common for the all case companies are: Fear and resistance to change, inadequate knowledge about TQM and costly and long-term study.

Systematic itemization of the potential driving and restraining forces would enable managers to design more effective strategies aimed at achieving the desired results. These factors (success and barrier) were identified and stratified, where some of them are found fundamental to be addressed in the implementation process. Figure 5.1 shows the critical success and barrier factors of TQM implementation based on the result of this research.
Figure 5.1. Critical Success and Barrier Factors of TQM implementation

**Success Factors**
- Upper management commitment and involvement
- Improving quality & productivity
- Developing employee involvement
- Increasing customer orientation
- Team Work
- Achieving positive change
- Quality training
- Identifying customer requirements and needs
- Use of quality tools

**Barrier Factors**
- Inadequate knowledge about TQM
- Fear and resistance to change
- Costly and long term study
- Inadequate planning
- Difficulty in developing company specific models
- Lack of competent management
- Lack of training
- Lack of consistent top management commitment
- Lack of skill of workers

**Key:**
+ = Promote
- = Inhibit
The various surveys independently conducted by researchers have revealed that awareness on quality of products and services has grown substantially in India. With quality based competition intensifying, Indian managements are showing keen interest in improving the quality of products through TQM. The result of present research shows that companies under study are actively propagating TQM through a variety of training and educational programs. TQM has proved to be a vital ingredient for success, and now has its permanent roots in the “mission and vision” of the Indian automotive sector. However, based on the result of present research regarding to the critical success and barrier factors and common observations the requirements for the successful implementation of TQM in Indian automotive industry can be summarized as follow:

- **Top Management Support and Commitment.** The degree of support and commitment by top management is critical for TQM success. Commitment of top management was one of the most important success factors for all the companies during the implementation of TQM, but not equally. *It is top of the list for companies 1, 2, 5, 6 and 7.* Top management must show unwavering support to quality and excellence, and must promote the effort aggressively in order to ensure support among middle managers and workers. A true test of management commitment lies in the amount of resources (time, money, people) that it is willing to allocate to the TQM implementation effort. Top management’s willingness and commitment to accept such change can inspire the entire organization to embrace the TQM process.

- **Long-Term Orientation and Persistence.** TQM is a long-term-oriented process which demands persistence and patience. One of the barrier factors during implementation of TQM for all companies was that they believe TQM is a long term study and requires a lot of programs and tools. *It was a major barrier factor for companies 2, 3, 4 and 7.* It is not a quick-fix and it often takes a long time before its impact can be known. Unwavering management support and its persistent guidance are needed in order to steer the organization towards successful TQM implementation.
• **Customer Orientation.** The customers’ needs and expectations must be carefully and continuously assessed and understood, and every effort must be made not just to meet those expectations but to exceed them. This applies both to internal and external customers. Customer orientation is a major goal for all the studied companies and all of them mentioned that increase in customer satisfaction is one of the significant outcomes of TQM. *For company 4, 5 and 6 it is the most important benefit.* They achieved this benefit by using customer satisfaction survey, customer complaint information and customer services.

• **Employee Involvement.** TQM success is unthinkable without the full and active involvement of all employees. It is a major success factors for all the companies but not equally. *Employee involvement is a very important success factors for companies 1, 2 and 7.* Employee involvement is a part of continuous improvement program in all the companies and introduced through some activities such as suggestion scheme and QC circle. Workers should be encouraged to utilize their latent innovativeness and creativity, and should be empowered to make their own decisions in matters related to their specific work.

• **Training.** Thorough, continuous training is a must if the TQM effort is to succeed. The training offered should include group dynamics, problem solving and task skills training. *All the studied companies have training centers and regular training programs* for all level of employees and managers and they believe that training is a important success factors for implementation of TQM but with vary degree of importance.

• **Teamwork.** While individual effort is recognized in TQM, the emphasis is on teamwork. Co-operation among departments and employees is a necessary ingredient for TQM success. Hence, employees must be well trained in group dynamics and in becoming effective team players. *Almost all the companies* follow some programs such as QCC, cross functional team, kaizen and suggestion scheme for both individual and group. The objective is to develop a sense of interdependence and a sense of shared purpose. Teams empowered to introduce
incremental improvements which will have a significant impact on the organization as a whole.

- **Reward and Recognition System.** A good TQM system will have built-in mechanisms for motivating and recognizing individual employees as well as teams. *Companies 1, 2, 3, 4 and 5 have a good reward and recognition system.* Top management reward both superior effort and superior results. The reward system is relevant, meaningful and consistent with the TQM philosophy. For example, it is designed in a manner that fosters co-operation and teamwork, and discourages destructive competition among workers and departments. Well-designed reward systems help to sustain the change process for a long time. For such reward systems to have a lasting effect, however, they are integrated with the overall organizational effectiveness and training programs.

- **Communication.** TQM seeks to change the established organizational culture. Hence, it often encounters doubters, skeptics and, at times, staunch resisters. *Almost all the studied companies have monthly communication meeting.* Top management is sensitive to this fact and strive to allay the fear and doubt that many members of the organization may have about TQM by instilling trust and assurance. Such communication include explaining the time frame for expecting visible benefits from the TQM system, short-term objectives and long-term goals, and sharing of success stories. In these meetings cash awards are given to all accepted suggestions and QCC project.

- **Measurement.** In TQM, measurement is needed to determine where the organization has been and how much it has improved on quality dimension. *All the studied companies have measurement systems* through some activities such as Customer Quality Improvement Activities, Manufacturing Quality Improvement Activities, Asset Productivity Improvement Activities, Raw Material Inventory Reduction and Total Employee Involvement. Measurement is essential to identify customer needs, to perform statistical analysis and to monitor progress. *All companies mentioned that customer line rejections decreased* after implementation of TQM. Another important purpose of measurement is to make
errors visible so that their causes could be identified and eliminated and all companies follow some techniques like FMEA and SPC for this purpose.

Based on this research, TQM can be defined as a management system, which consists of three interdependent units, namely core values, techniques/programs and tools. The idea is that the core values must be supported by techniques, such as process management, SPC, QFD, benchmarking, FMEA, customer focused planning, or improvement teams, and tools, such as control charts, Seven QC tools or Seven new management tools, in order to be part of a culture. The implementation work should begin with the acceptance of the core values that should characterize the culture of the organization. The next step is to continuously choose techniques that are suitable as support for the selected values. Ultimately, suitable tools have to be identified and used in an efficient way in order to support the chosen techniques.

An important aspect also investigated in this study was the results and outcomes from implementing TQM. The types of positive intangible outcomes ranged from managers realizing the importance of quality improvement, pride in work, quality improvement becoming a part of the culture and improved communication. In addition, they mentioned improved teamwork, the feeling that everyone was important, and everyone was recognized for their contribution. With regard to the tangible outcomes, the case companies have achieved numerous improvements ranging from improved product quality, improvement in productivity, an increase in the number of employees involved in improvement activities, and improved customer and employee satisfaction. They have also experienced reductions in delivery times, decrease in defects and improvement in morale. It was not intended for this study to enquire about the actual magnitude of the improvements made. It was observed, however, from a number of graphical results displayed in the quality area, that drastic reductions in defect parts per million of most production cells in the manufacturing area had been achieved in all cases.

The result of cross-case analysis shows similarities and differences in approach to TQM implementation among seven companies. As to the origination of TQM implementation to their companies, the respondents in three companies mentioned top management and another four companies mentioned parent company. Of seven
companies studied four of them followed Deming award model and three of them followed European Foundation for Quality Management (EFQM) model. It may be because the studied companies are Japanese or European joint companies. The result of this research also shows all companies except companies 1, 3 and 4 first adopted ISO certification and later moved toward TQM. This is because companies get results from registration and this prompts managers to pursue higher levels of quality. Of the seven companies studied, companies 2, 5, 6 and 7 have obtained ISO9001; companies 5 and 7 have also obtained ISO9002. All the top managers interviewed in companies 4, 6 and 7 agree that ISO is a prerequisite for the implementation of TQM. Four out of five in company 2 agree on the same while three out of five in company 5 agree. Four out of five in companies 1 and 3 do not agree that ISO is a prerequisite for the implementation of TQM. It is noteworthy that companies 1 and 3 have not obtained any ISO certificate. Though company 4 has not obtained any ISO certificate, all the five top managers agree that ISO is a prerequisite for the implementation of TQM.

The research shows some quality programs such as Statistical Process Control (SPC), Quality Audit (QA), Total Productive Maintenance (TPM) and Failure Mode and Effect Analysis (FMEA) are the most quality programs undertaken by all companies during the implementation of TQM. The respondents were asked about the time taken to implement TQM. Almost all respondents from the case companies 1, 2, 3 and 4 which have fully implemented TQM indicated that the average implementation time of TQM was between four to six years. Companies 5, 6 and 7 started implementation of TQM almost two years ago and they are in process of implementing TQM.

The comparison between the cases, referring to which core values the respondents considered permeating the organization, also shows both similarities and differences. One significant similarity is that the three core values (top management commitment, everybody’s commitment and customer orientation) were the most important core values for all companies at the time of implementation of TQM. In a majority of the cases these three core values were partly permeating the organization even before the formal quality development work started. The fact that all organizations had implemented these core values implies that they are both necessary and suitable to start with when implementing TQM.
Future Research Directions

The present study has raised a few issues for future research. First, the present study is basically exploratory in nature. More research in this area is still needed in order to confirm the findings that TQM companies emphasized more on the quality aspects and strengths of their management practices.

Second, this study was confined only to the automotive industry. It is suggested that future research should cover not only automotive industry but other manufacturing and service industry as well. Manufacturing and service industries differ widely as service organizations depend basically on people to produce and sell their products which are intangible services. Therefore, both industries may be different in terms of their critical success and barrier factors and their quality improvement programs. A comparison can be made in terms of the relationship among the nature of operations, management practices and TQM parameters.

Third, this study was confined only to the target respondents-the top managers and middle level managers. Since TQM is an organization wide practice and it requires total participation from all levels of employees, it is suggested that future research includes all levels of employees which includes top executives, middle management, first level management, employees and operatives. This will provide a better understanding and more comprehensive view of how employees serve as sources of ideas and innovation.

Fourth, for future research, the study could focus on small and medium sized enterprises (SMEs) and investigate the implementation of TQM in SMEs and compare with large scale companies.

Fifthly, this research was a multiple case study and limited to some selected automotive companies. Further empirical studies can be carried out by increasing the sample size in other parts of the country. Efforts to include companies in other part of country will certainly enhance the significance as well as the validity of the results. Lastly, the study could focus on quality aspects and firms’ performance in TQM and Non-TQM automotive companies.