CHAPTER - 7

CONCLUSION AND RECOMMENDATIONS
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Conclusion

Relevance and justification of Hypothesis

The researcher has laid down three foundation statements as hypothesis. The analysis has given insights in this regard. This helps to draw suitable conclusions regarding reliability of the hypothesis.

**Hypothesis H1:** It is noticed in this study that even today there are many misconceptions regarding the concept of total quality management. It is not properly understood at the management and functional level. This misnomer has hampered the effective implementation of quality management system. The reason for low implementation of quality management systems at various levels is due to this limited and narrow understanding. Hence Hypothesis H1 is tested and found valid.

**Hypothesis H2:** The success of quality management systems used indicates that there is a positive response to quality concept in the units where Quality Circle, Six Sigma as well as such as other systems are implemented. Hence it can be said that the workers have positive and optimistic view towards quality concept. But it is also noticed that the support of management has to be pervasive and total. This justifies Hypothesis H2.

**Hypothesis H3:** At present most of the units under study used one or two methods of quality management like Quality Circle, Six Sigma, and TPM etc. Similarly the approach of these units towards Quality Systems is also not exhaustive. These units adopt one method at a time. This results into getting limited success of the quality management approach. Hence Hypothesis H3 is also found valid and justified.
Other Conclusions

1. As we all know that quality is not an accident. It requires sincerity, hard work and perseverance of the people. This was proved consistently during the research. The people working on either of the quality systems are so dedicated that it has changed the entire culture of the organization resulting in positive improvement of the people and the products or services.

2. Every industry big, medium, or small is found to be interested in improving quality of its products or services. In all the industries some defined or non-defined quality system or systems are being implemented and they are found to be on the right path of improvement.

3. The organizations have enjoyed many tangible gains after implementing either of the quality systems like increased production, increased sales and profit, increased tool life, reduced man power, breakdown, defects rejection, rework, cost of production, etc.

4. The implementation of quality system has resulted into all round development of the people in the organization. They accept that they are enjoying many intangible gains like personality development, better communication skill, team work, leadership quality, knowledge of tools and techniques, of quality systems, increased efficiency, cooperation from and harmony in the staff, etc.

5. After studying the parallel systems of quality management with reference to Nashik industries, it can be said that all these systems are working reasonably successfully in these industries. Though in some big industries latest systems of Quality Management like TPM, Six Sigma are
being implemented, in some industries still old methods, defined or non-defined systems are followed.
There are many common factors found in these systems.
I Quality circles are the teams. Like these teams, there are TPM teams in case of Total productive Maintenance or Six Sigma teams where the company is doing Six Sigma.
II Similarly Kaizen activities are done where TPM, UNIDO or Six Sigma is being implemented.
III In both, UNIDO and TPM, stress is given on cleaning of the machines by the operator himself. In fact it has been made an important activity in UNIDO And TPM.
IV Again process capability is decided while fixing the target of Six Sigma as well as in UNIDO.
In short, these systems are similar to each other in some aspects and differ in some aspects. As we all know their aim is the same, to achieve excellence in quality.
6. It can be said that the industries in Nashik are keen on improving the quality of their products/services. They are making innovations and that is the reason they sometime have switched over from one quality system to the other. As this systems are need based, the same system may make a comeback has it has happened in case of Nashik industries. If we trace back to the journey of quality management in Nashik industries, we find that the companies have switched over from one system to other as per their priorities. The recent rejuvenation of QCC movement in Nashik is an example of this.
However for such a come back a reengineering of quality management systems is necessary.
7. History tells us that destruction is the prerequisite of creation. We cannot forget that Japan discovered the QCC in 60s only after the colossal destruction caused by the II World War. Japan did a wonderful service to humanity by discovering QC Circles in 60s. It showed a genius approach to utilize human potential to its peak and revolutionise industrial excellence. Fortunately there has not been a world war, however another world war or word war between the companies and countries across the globe is going on. Everyone wants to perform the best and does not want to stop. In order to compete and meet customers' needs and greed what is required is re-engineering of quality systems suitable to Indian conditions.

The definition, scope of QCC needs to be challenged, previewed redesigned suiting to new business environment. Companies are always more interested in financial benefits rather than human development. To cover this scenario, concept of E-QCC has been introduced. Here equal focus is to be given on companies' financial objectives as well as for human resource development. A balance is to be maintained between the two. One main measure to implement such balance is to analyse cost involved in running a particular QCC and the financial results obtained from the projects done by that particular QCC in a specific time period. This analysis is to be done and presented to the management for evaluation. For this, top management commitment to QCC and more responsibility to middle management group is required. Emphasis should be given to top management commitment, as there are instances of failure of QCC in UK and Europe in general due to lack of support from top management. In India too, in the last decade we find the failure of QCC at some places due to the same reason. One more reason is new business challenges such as ISO, TPM Six Sigma, TQM, etc because of which the quality circle took a back seat.

8. During the study it was observed that some companies are trying to adopt Six Sigma. But due to its expensive training cost (to black belts), only
multinational companies presently can afford it. However in terms of long term benefits and globalisation, adoption of Six Sigma though expensive, is very much worth having. In Nashik there are many large, medium and small-scale industries, which can benefit from Six Sigma.

In the present Scenario of globalisation the age-old moral that ‘slow and steady wins the race’ has become outdated. If we extend the original story of hare and tortoise, we may imagine a different end, where the defeated and disappointed hare decided to run the race again. He won the race by miles not stopping from start to finish. The moral of this extended story will now ‘it is good to be slow and steady but it is better to be fast and consistent.’

In the context of different systems of Quality management it can be said that old systems were good and effective in the old context but in the era of globalisation new systems like Six Sigma, TPM, which give fast and consistent results, will be more effective.

In the extended version of the story, the tortoise realised that there is no way he could beat the hare in a race, the way it was currently formatted. So he now changed the route and challenged the hare in the race. The hare as usual ran fast until he came to a river. The finishing line being a couple of kilometers on the other side of the river, the hare sat wondering what to do. In the meanwhile the tortoise swam across the river and won the race.

The moral of this f the story in the context of quality management systems is that the new systems as well as re engineering of the old systems should be introduced only after identifying the needs and priorities, otherwise it will be like the hare blindly following the maxim that it is better to be fast and consistent.
The story continues and the hare and tortoise by this time became good friends and they did some thinking together. They decided to run as a team. They started off, the hare carrying the tortoise on his back on the land and the tortoise taking over the hare on its back and swimming across the river. Thus they finished the line together. They both felt a greater sense of achievement, satisfaction and success.

The moral of this part of the story is ‘unless you are able to work in a team and harness each other’s best potential, you will always perform below par; because there will always be situations in which you will perform poorly and someone else will perform well’. In the context of Quality Management system, also, the old system may perform well in certain situation while the new systems in other. But the old and new system together will invariably perform well for all the time.

Thus to arrive at a golden mean we can have a combination of QCC and six sigma.

9 Though many times QCCs are found working at grass root level, it can work at any level provided little training of tools and techniques of Six Sigma is given to the circle members. With this training little more complex problems can be solved by QCC. So we can have Six Sigma Quality Circle which will work at all levels in the small, medium and large-scale industries in Nashik as well as in education field. And yes, in our personal life, too.

Achieving the zero defects, which is the aim of Six Sigma, is lifelong process, which requires hard work sincerity and perseverance of the people at every step. In India we have brilliant minds at work. If they take this as a challenge, the dream of zero defects will no longer remain a dream. This will also motivate them to work for their country. Who knows? This may stop the brain drain to some extent in future?
10. To implement Six Sigma QCC, we need to have quality improvement at every step, from the plant to its end result i.e. customers' satisfaction. In the plant TPM system of quality management can be of great help whereas Six Sigma can equip us with latest data to decide the strategies and for automobile industries we have UNIDO, which is the combination of many systems.

11. QCCs are not only successful in the industries but have also proved equally effective in service industry as well as in the education field. Quality Circle system of Quality Management has been found successful in this field.

It must be noted that whatever system the company follows, teamwork and proper leadership, both are very important. When the leadership is right and the time is right, people can always be counted upon to follow to the end and that at all costs. It must be kept in mind that in the extended story of hare and tortoise, neither the hare nor the tortoise gave up after failure. Failure is an event, it is never permanent. The tortoise changed his strategy as he was already working hard. In life, when faced with failure, sometimes it is appropriate to work harder and put in more efforts by working smarter. Sometimes you change your strategy and try something different and sometimes it is appropriate to do both. The industries in Nashik should take note of this. No quality system will fail completely and permanently as the goal of such system is for the benefit of mankind. Only the industries will have to try both.

Remember such failure is not permanent and that is the reason, we find the old systems are rejuvenated. With re engineering, as per the need of the time, these systems will undoubtedly achieve a great success.

This thesis started with a sentence “Quality is not an accident, it is an outcome of consistent efforts made in the direction of the enhancement”. We
may go one step ahead and say that India has a long tradition of quality in all consumer articles.

The history of quality and standardization in India goes back to 1500 BC when trade and commerce had flourished on the western as well as eastern coast. It consisted of consumer articles like silk (known as ‘velvet’ at that time), spices, utensils of bronze etc. History tells us that this standardization of quality can be stressed back till the beginning of the British period. There was a marked deterioration in quality during the British Raj. Unfortunately due to the population explosion, this deterioration continued even in post independence period.

If we believe that we should learn a lesson from history, we will have to avoid the mistakes we have done in the past. Our golden past would always give us an inspiration to strive for perfection provided it is clubbed with modern technique of quality management. We should not forget that for the success of any quality system, what is required is the dedication of the people working for it. If these human resources are properly ‘exploited’, the quality will come in its natural way. India is gifted with richest human assets. If these assets are properly utilized, quality will be a part of our daily life. It this happens, Michael Harry’s prediction that India will be on the top in the next ten year will definitely come true. I have arrived at some recommendations, which I would like to state very humbly.
Recommendations

We have seen that QCC activities are rejuvenated. In many Companies in Nashik, in the few years of last decade, Quality Circles were in full swing. But later on for the few years of last decade, we noticed a decline in these activities mainly because of ISO activities. However, in the recent years, we again find that in many industries in Nashik, Quality Circles have been re-started. Following points are important for the success of Quality Circles.

1. Quality Circles if strongly supported by the Top Management will successfully survive in the organization and will play major role in the improvement of quality.

2. For good quality work, basic ingredients are education, training, knowledge, application and motivation for self-development. If Quality Circle members are given proper training and education, it helps them to work successfully in the Quality Circles. It has also helped them in self-development. Many Case studies have proven this.

It is said that Creativity = Environment x Skill x Motivation. These 3 factors are absolutely essential for creativity. To some extent Quality Circle provides the environment. The management has to see to it that this environment is provided to the quality Circle members. Sufficient Skills to deal with the problem analysis and its solution are given to the members before starting Quality circles. This is achieved through training programme. The very important fact is that the human being feels motivated when he / she is appreciated for the work done by him / her. Appreciation by the top management is the way of motivating the people. Also the satisfaction they get through a sense of achievement.

3. Recognition and responsibility given prove to be equally important for the person to get motivated. It has been experienced that lack of any of

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these 3 factors may result in the failure of Quality Circle Movement. It must be noted at this point that the Quality circle movement may have certain drawbacks (already discussed) but these problems will certainly disappear with the proper training given to the members. Management support and the motivation in right direction will create harmony amongst the members.

4. Though we say that management support is essential, it should not lead to an excessive interference in the working of QC Circles. Quality Circle is a voluntary association of people who come together to solve the problems related to their work area. They want to improve the quality of their product or workplace. Basically quality is the product of self-esteem at work, which comes from the autonomy in accepting responsibility, accomplishment and belongingness. The QCCs are the outcome of all these. So management should take note of all these factors to make Quality Control Circle activities more successful.

5. However it should be noted that Quality circle is not the only solution to the quality problems. There are other quality systems proved equally meaningful in the recent years the ‘Total Productive Maintenance’ is also proving very successful in manufacturing industries in Nashik. It begins in the plant with the full cooperation from the machine operators. However it has top down approach like that of Six Sigma.

Same as TQM the role of Top management is very important in TPM and Six Sigma. The top management must have a declaration to introduce TPM or Six Sigma, decides policies and targets, join activities and in the audits of all activities in case of TPM.

Making TPM focus of its all activities, FMCG companies in Nashik can attain TPM goal in the time to come. As TPM require activities directed
towards it at every level, the company should have only one initiative – TPM.

The company should go through 2 phases to implement TPM successfully* the preparatory phase & implementation phase. Of course a lot of implementation work actually begins in preparatory phase. The factory needs to take at least 21 steps before kick off. These include items like clearing annual budget, awareness training, and communication with employees’ unions, creations of TPM organization & TPM circles, & secretarial initiation of AM etc.

A company should go for further kick off ceremony only if it is not taking TPM lightly & showing at least 3% improvement in OEE. Then only TPM as a tool of quality improvement will be a success.

6. It is very interesting to note that there are lot of good points common in TPM and Quality Circles, such as all members’ participation, contribution to Quality of working and Quality of product and service, autonomous operation, etc. Most of these are used in TPM Circles because of their effectiveness. Similarly TPM has also some good points such as Step Activity, Audit of Jishu Hozen activity, One point lesson, Activity Board, theme Selection for Kaizen activity, thinking deeply about special knowledge and top down activity.

(As Mr. Chatterji of HLL states)*
These good points can be integrated to QCC activity

I In step activity, what workers must do is described in detail. To apply it in QCC, Handbook of QCC can be made. In this book, what is needed for good QC Circle in alignment to company’s policy should be mentioned. This type of knowledge is essential not only for the members but also for the managers and top management. Along with this, they should also know the way to measure their performance. In every country and in each company, QC activities should get modernized and everyone from top to bottom should know about it.

II In TPM, there is Audit of Jishu Hozen activity at regular interval. To apply this to QCC, it is recommended to make evaluation sheet for QC Circle. To evaluate the performance of QC Circle, the criteria used by most of the companies is presentation. That is important but evaluation of daily activity is more important.

III One point lesson (in TPM) is the system made by workers to teach each other. It can be applied in QC Circles also. The topic can be anything from how to get data, how to make graph, how to analyse and even how to make presentation etc. To focus on one point at a time is important and effective.

IV Activity Board is used by QC Circle but it is not permanent. Activity Board in TPM is permanent which gives constant Stimulation. QC Circle can show its policy, target plan, present activity status, result of the activity etc. like that of TPM. on Activity Board.

V Theme selection For Kaizen improvement activity – in TPM ‘loss tree’ makes easy theme selection for small group. Let QC Circle know and understand it.
VI Until now there is little thinking of special knowledge or wisdom at QC Circle activities. This may come from the concept that every member’s participation is important. But it sometimes makes skill improvement weak and less effective. The QC Circle should be keen about special knowledge.

VII About top-down activity much has already been said. In TPM, it is seen at every step, but in case of QCC, management only attends QC Circle presentation meetings. It is not enough. Top management must show its attention to QC Circle by making site tour and appreciation of QC Circle on the shop floor.

There are many small and medium scale industries in Nashik. By incorporating the above-mentioned good points of TPM with QCC, they can enjoy the advantages of Total Productive Maintenance.

7 In Japan recently “e-QCC” (evolutional QC Circle activities) was proposed. It was introduced at I.C.Q.C.C. 2003 Tokyo. It aims at (I) activities for heightening the value of individuals and sharing the sense of gratification, (II) Activities for promoting self-fulfillment integrated with business processes, and (III) Activities that are not bound by form and pursued in a wide range of workplaces and organizations. Why can’t we be innovative enough to follow these activities in Indian context too?

Six Sigma has been quietly developed over the past 10 years. It also comes from the Top Management. The large organizations have huge resources to launch such full time programme for a long period. For a successful Six-Sigma programme, the top management needs to see that the black belt is really working full time on the Six Sigma project and not been deputed on any other
work. Also in many companies, we find that the number of black belt is very less. So often the expected results are delayed. The companies should make Six Sigma a single important event to achieve the goal as per the schedule.

8 The companies doing Six Sigma should pay attention to ‘Control phase’ of DMAIC. As experienced many times in the past [even in G.E.], that once the target is achieved, there is a sort of lethargic behaviour seen amongst the employees resulting into the regression or going back to number one stage. To avoid this, the companies must establish the ‘Control Plan’ to standardise the new process and ensure that it remains at the improved level of performance. A control phase provides the means to measure the long term project results and prevent personnel from returning to previous methods especially when coupled with ISO 9000 type document control plan. In Nashik, where Six Sigma is being implemented, ISO 9000 certification has already been acquired. For these companies this factor is very important to take note of.

9 Again it should be noted that achieving the goal of Six Sigma is a long-term process, which requires sincerity and a lot of patience. In India, we do not have a single company, which has achieved this goal or has come nearer to this goal. The only example of Six sigma can be given is ‘Dabewala service’ in Mumbai. [And the black belt always reminds us that there is only one function or activity in this service, picking up Daba, reaching it to its proper place and bringing it back.]

10 It has been observed that in Nashik, where Six Sigma is implemented, this programme is rightly focused, but unfortunately there is not a single instance of small or medium scale industry
where Six Sigma Programme is going on. Due to lack of funds, massive training programme for black belts is not possible for these industries. The number of employees in these industries vary from 25 to 500 where a full time black belt may be needed for a fraction of a time.

To overcome these limitations Process Quality Associates [PQA] has developed a Six Sigma deployment plan for a small and medium scale industries. So the small and medium scale companies in Nashik can take advantage of this plan. According to this plan, the company need not appoint the black belt on full time basis. Instead a PQA will act as a black belt until the company generates saving. [In Nashik, in case, the services of PQA are not available, Six Sigma consultant can substitute PQA.] Then this saving is used for training its own green and black belt(s). Then Six Sigma black belt training will be self-funding. With more and more savings the scope of Six Sigma can increase. This black belt can be called when Design of Experiment or sophisticated techniques are to be implemented. Let us remember, majority of the improvements projects can be performed using less sophisticated statistical techniques.

If the above recommendation is sincerely implemented, small-scale industries in Nashik would definitely flourish.

11 We find that DMAIC methodology is somewhat based on Deming’s PDCA cycle which is also the base of QCC. To enhance the effectiveness of QC Circle, DMAIC roadmap may be recommended.

Six Sigma activities are done at higher level and by the employees with certain skills. On the other hand QC circle may be operated by the workers or the machine operators The step-wise activities followed by the QC circle may not be efficient and/ or effective
enough for finding appropriate solutions in changing business process environments and constraints due to rapid development of markets, their diversity and uncertainty. It is difficult to find out appropriate solution for continuous quality improvement due to excessive competition and uncertain market conditions.

To overcome these difficulties, one of the solutions may be a combination of QCC with Six Sigma, i.e. Six Sigma can be used to enhance the effectiveness of traditional QC Circle with Six Sigma tools. QC circle can use Six Sigma roadmap to increase its effectiveness. This roadmap can be considered as highly disciplined model for using the statistical methods to carry out experimentation, learning and improvement.

Samsung Electro-Mechanics modified the problem solving process for QC circle to apply it creatively and effectively to the quality improvement projects.

For the purpose of implementing successful Six Sigma initiatives, there is need to extend the training to the bottom line personnel in all functional areas. Many companies are looking for such training programme as an alternative to the traditional training for QCC in comparison with black belt or green belt training; this training programme to bottom line personnel should be minimal. It will be well standerdised with the format of white belt training.

Six Sigma and Quality Circles through team working enable us to achieve maximum performance improvement for conducting business. Also both approaches can be used in all types of business such as manufacturing, service regardless of their sizes.
### 7.1 Six Sigma training contents for Q.C. Circles.

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<td>Selection of the problem.</td>
<td>Intro. Of qc activity, theme selection according to importance, presentation of theme selection(graph. Pareto),activity plan(Gantt Chart)</td>
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<tr>
<td><strong>M</strong></td>
<td>Current status Analysis of the process capability, Improvement target</td>
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This will enhance the effectiveness of Quality Circles as well as such training given to selected operators or non-supervisors will widen the area covered by Six Sigma.

It should be noted that QC Circle might not need all these tools every time in their problem solving process. But the knowledge of these tools will surely help them in solving complicated problems and also in continuous quality improvement. This will enhance the effectiveness of and strengthen the quality circle movement in small, medium as well as large scale industries in Nashik. We can even call such Quality circle as **SIX SIGMA QUALITY CIRCLE**.