CHAPTER 7

CONCLUSION

7.1 INTRODUCTION

A study of literature leads to an impression that KM principles are adopted throughout the world intensively (Chauvel and Despres 2002; Singh et al 2006). Likewise the frequently addressed topics like QC, FMEA and ISO 9000 certifications in literature lead to an impression that TQM programmes are conducted vigorously in organizations. However, on overviewing the organizational scenario, these impressions appear to be the contradictions of what are discerned from literature era. In order to overcome this disparity, the research reported in this thesis was carried out by integrating both the theory and practice. This is evident from the fact that the three models namely KMQC, KMTFMEA and Knowledge Managed ISO 9001:2000 based Quality System were first theoretically designed and then their practical implications were studied. Moreover the knowledge portals of the three models were developed. However, this research has to proceed with certain difficulties and face challenges. It is necessary that future researchers shall understand these kinds of impediments to further proceed in the direction of integrating KM principles with TQM programmes. In order to contribute in this direction, in this concluding chapter, the research experiences on developing the above three models are narrated. Under each of these sections, the scope for future research is indicated.
7.2 RESEARCH EXPERIENCES ON KMQC

Quality circle is one of the oldest techniques of TQM. Quality circle has the history of unearthing practical and theoretical quality problems. The origin of quality circles goes back to 1950s in the USA (Goulden 1995) and its growth was so intense that research articles on it were flooding the literature arena during 1980s (Pinnington and Hammersley 1997). At one point of time, Sillince et al (1996) contributed a research paper listing the sources of articles on quality circles. Such a powerful technique has served not only as an idea generator but also as a promoter of cooperative culture within the individual organizations.

Quality circle has been viewed largely as a problem solving technique for generating ideas from within the organization and evolving solutions. In order to carry out this process, cause and effect diagram has been predominantly used. All these proceedings resulted in the gathering and pooling of localized ideas. Very little knowledge was also occasionally and spontaneously evolved through the conduct of quality circles. The world class quality using this knowledge was not attainable as it originated from the localized organizational environments. This confinement leads to the outdating of the use of quality circles in modern organizations which require to acquire the globalized knowledge to excel in the market (Davis et al 2005). On realizing this situation, the principles of KM are being increasingly adopted in the modern world. This trend extrapolates the necessity of integrating KM and quality circle principles. In order to fulfill this need, KMQC model was designed during a module of this research. The unique feature of KMQC is that it allows the enrollment of members who are geographically dispersed and sharing of their both theoretical and practical knowledge. This facility enhances the quality of the solutions evolved through KMQC. This is due to the reason that the global knowledge is highly valuable than that is derived from within the single organization.
After designing KMQC model, its implementation feasibility was studied at RMP. This task was very challenging. In fact, the implementation of KMQC was only partial in RMP. But, this partial implementation enabled the derivation of the following success ingredients of implementing KMQC in companies.

i. A series of seminars on KMQC has to be conducted exclusively for the top management personnel for enabling them to nourish KMQC principles.

ii. Teambuilding capabilities among the employees are to be developed.

iii. Intensive education and training programme on KMQC are to be conducted to the employees.

iv. Conducive environments are to be created in organizations for knowledge creation, sharing and utilization.

v. Appropriate efforts should be made to tune the mindsets of top management personnel to give priority to quality of products to sustain in the market, instead of delivery of product alone.

vi. Employees must be free from the fear of sharing their knowledge.

Direct support of top management personnel for successful implementation of KMQC is a vital requirement. The features of KMQC model which are novel and innovative should be spread across the industrial, research and institutional arenas. More studies in this direction will be helpful for refining the KMQC model and making it practically compatible. This will help in developing a practically compatible KMQC model that will be a boon to today’s knowledge hungry societies.
7.3 RESEARCH EXPERIENCES ON KMTFMEA

Quality engineers have been striving for several decades to prevent failures with the aim to improve quality on continuous basis. In order to identify and analyse the failures, two techniques namely FMEA and Fault Tree Analysis emerged are used in quality engineering field (Sharma et al 2007). Besides recording the failures, these techniques aim to determine the causes of failures and prevent their recurrence. Out of these two, FMEA has been widely accepted by the practitioners (Chang et al 2001). Hence cases reporting the successful implementation of FMEA emerged in literature during 1980s.

Of late, researchers have been reporting the deficiencies of FMEA. Some of them have been evolving improved versions of FMEA (Chang et al 2001). In this research, one of such improved versions of FMEA, which has been titled as TFMEA, appeared in the literature (Devadasan et al 2003) was adopted. Though this technique aids in bringing out totality in failure prevention, it is noted that its potential can be improved significantly if it is incorporated with KM tools. The integration of KM approach with TFMEA improves both the acquisition and use of knowledge relevant to achieving business success through the prevention of failures. In this context, the research work reported in chapter 4 of this thesis has been carried out.

The research work reported in chapter 4 of this thesis resulted in the evolution of KMTFMEA model. Since this technique is very new, its implementation in RMP was a challenging task. Studies were conducted pertaining to three failures in compressors. Another contribution of this research work is the creation of a portal using Hyper Text Markup Language (HTML), Active Server Page (ASP) and Microsoft Access. By using this portal, companies can gather global knowledge which would be provided by
the international members of KMTFMEA. Also, this portal will act as gateway to reach other web sites to source the knowledge. This will lead to form global partnerships for identifying and preventing failures. The implementation experiences indicated the practical feasibility of KMTFMEA provided the management’s support is ensured.

7.4 RESEARCH EXPERIENCES OF KNOWLEDGE MANAGED ISO 9001:2000 BASED QUALITY SYSTEM

The research reported in chapter 5 of this thesis has shown the way of amending KM principles with ISO 9001:2000 standard. Due to the absence of management support, the implementation of Knowledge Managed ISO 9001:2000 based Quality Systems could not be effectively carried out. Later on, the portal of clause 4 of Knowledge Managed ISO 9001:2000 based Quality System was developed. The experiences gained by pursuing this research were used to evolve the roadmap for the successful implementation of Knowledge Managed ISO 9001:2000 based Quality System in contemporary organizations. The principle of KM points out that the processing of data becomes information. The application of intelligence in information results in knowledge (Herschel and Jones 2005; Border 2006). Currently the modern organisations are even yet to realise the importance of infusing information in ISO 9001:2000 quality system. In this situation, it is very difficult to carry out the research exploring the practicality of infusing KM in ISO 9001:2000 based quality systems.

7.5 SCOPE FOR FUTURE RESEARCH

- Besides KMQC model, this research work resulted in the development of a knowledge portal. The successful running of this portal leads to an impression that this portal would
accelerate the integration of KM and QC principles and offer synergic effect. However, there exists potential for carrying out further work in this direction. More research is required to design a highly interactive knowledge portal to incorporate the entire functionality of KMQC. Such an effort would provide knowledge intensive solutions to the global community at economical price.

- Even though FMEA was developed around four decades back, many companies in the world began to implement it after FMEA was specified under QS 9000 standard. Currently TS 16949 standard also includes FMEA as one of the techniques (Chang et al 2001; Fong and Antony 2001). Many automobile companies are implementing either QS 9000 or TS 16949 standard. However the companies are yet to fully nourish the benefits of preventing the failures through FMEA. In this context, it is envisaged that future researchers may closely tie up with companies and implement TFMEA technique.

As mentioned in some of the earlier chapters, the impact of knowledge explosion is yet to be sensed in many companies. Hence, future researchers may also work in the direction of sensitizing the companies to make use of IT infrastructure for grasping knowledge and managing them to achieve competitiveness. Once the task of implementing KM and TFMEA are accomplished, the future researchers may adopt the roadmap presented in the chapter 6, (Figure 6.2) and practically implement the same in companies and study the practical implications of KMTFMEA. Future researchers may also exclusively work on higher end products of IT infrastructure
(like video conferencing and electronic data interchange) to make KMTFMEA more powerful.

- As mentioned earlier, the implementation of Knowledge Managed ISO 9001:2000 based Quality System could be conducted only to an insignificant extent as this project was not motivated by the management needs. On considering this limitation and as a solution to overcome them, this research ended by pointing out the need for more research which would help the organizations to carry out the journey to nourish the authentic benefits of implementing Knowledge Managed ISO 9001:2000 based Quality System. The module of the research reported in chapter 6 has moved the modern research through one step in this journey. Further researches are required to move through the remaining steps of this journey to successfully implement Knowledge Managed ISO 9001:2000 based Quality System. These future researches shall involve the conduct of several case studies in different types of organisations. The outcome of these researches if utilised appropriately would enable the organizations to acquire core competencies and progress towards a new and advanced intellectual civilisation.

7.6 CONCLUDING REMARKS

The contemporary literature arena reports the massive growth of managerial and technological devices and models in the world. Particularly, among the manufacturing researches, IT and TQM are appraised with high emphasis. Most of the papers reported in this literature arena leads to an impression that IT and TQM have rooted strongly in all types of organizations (Boucekine and de la Croix 2003; Jorgenson and Motohashi 2005;
Gunasekaran et al 2006; Neirotti and Paolucci 2007; Vouzas and Psychogios 2007). A section of the authors also claim that IT has envisaged the modern organizations to acquire globally competitive knowledge which is available abundantly (Mohamed et al 2006). This abundant availability of knowledge makes its management a challenging task. Hence, the field of KM is also widely deliberated in literature. In this background the research reported in this thesis was carried out with the objective of examining the theoretical and practical propensities of integrating KM with TQM strategies. This effort was made by integrating the principles of KM with QC, TFMEA and ISO 9001:2000 standard.

An overview in the industrial scenario indicated that contradictory to the impression that are derivable from literature, the KM and TQM strategies are implemented in traditional manufacturing companies only to insufficient and scattered extents. During this research the this status was discernable as, IT and KM are not much sensed in RMP and the public sector company in which the implementation studies reported in this thesis were conducted. Likewise, ISO 9001:2000 standard is widely implemented, while other TQM techniques like QC and FMEA are not visible in traditional manufacturing environments. Hence a research like the one reported in this thesis involving both the theory and practice on integrating KM with TQM strategies must face several hurdles. In this background the research reported in this thesis also could be accomplished only to some extent by overcoming several hurdles. Hence the author of this thesis claims that this research is a first step towards the journey that will lead to the implementation of KMQC, KMTFMEA and Knowledge Managed ISO 9001:2000 based Quality System models. This journey would be complete only if further research is conducted by applying the roadmaps presented in sixth chapter of this thesis in several traditional manufacturing companies and the results are used to refine and improve these models.