ABSTRACT

During 1970s, the world witnessed the evolution of Japanese induced global competition. After that, a number of quality management techniques, approaches and models emerged in the world. At that point of time onwards, the world community began to address them under the topic Total Quality Management (TQM). These TQM techniques and models are implemented in the contemporary world to different extents. In the meantime, the world has experienced the rapid development and growth of Information Technology (IT) infrastructure. As a result, the boundaries between the countries have been removed and the world is becoming a single entity. One of the impacts of this development is knowledge explosion.

Because of the ‘knowledge explosion’ phenomenon, abundant knowledge is currently available in the world. Hence, managing knowledge has become a challenge to the modern engineers. As a result, the field of Knowledge Management (KM) has been researched by recent researchers to exploit knowledge for achieving competitiveness. However these researchers have been failing to realize the need of integrating KM principles with TQM techniques and models. In order to contribute in this direction, the research work reported in this thesis was carried out.

The research work reported in this thesis consisted of three modules. During the first module of research work, KM principles with
Quality Circle (QC) concepts were integrated. This resulted in the design and development of the technique named as Knowledge Managed Quality Circle (KMQC). During the second module of this research work, KM principles were integrated with an advanced model of Failure Mode Effects Analysis (FMEA) known as Total Failure Mode Effects Analysis (TFMEA). The outcome of this module of the work is the design and development of the technique named as Knowledge Managed Total Failure Mode Effects Analysis (KMTFMEA). Both KMQC and KMTFMEA were subjected to implementation study in a compressor manufacturing company.

During the third module of this research work, KM principles were appended with ISO 9001:2000 standard. The outcome of this module of the work is the design and development of Knowledge Managed ISO 9001:2000 based Quality System. This Knowledge Managed ISO 9001:2000 based Quality System was subjected to an implementation study in a public sector organization.

The hallmark of KM projects is the construction of knowledge portals. Hence, during the three modules of the research work, the portals of KMQC, KMTFMEA and Knowledge Managed ISO 9001:2000 based Quality System were developed. At the end of conducting each module of the research work, the roadmaps for successfully implementing KMQC, KMTFMEA and Knowledge Managed ISO 9001:2000 based Quality System were developed.
Before concluding the work, the difficulties experienced to pursue the three modules of the research work were analyzed. It is foreseen that the world community has to go a long way to implement the techniques and models contributed in this research work. Hence, this research work ended by suggesting future researchers to concentrate on practically implementing the techniques and models which are reported in this thesis.