CHAPTER 7

CONCLUSION

7.1 INTRODUCTION

During the past one decade, due to the intensified competition and rapid advancement of technologies, the life cycle of products has been shrinking (Mu et al., 2007). Due to this phenomenon, the world has been witnessing the frequent entry of new products infused with amazing features. The appearance of new models of mobile phones with features like video conferencing and internet browsing can be cited as the evidence to support this statement (Vinodh et al., 2008). As a result, the old models of products become obsolete within a short period of time. Because of this development, large size companies are unable to economically install facilities to produce new products and get back the investment within a short period of time. In this situation, large size companies have been largely outsourcing their activities to SMEs (Antony et al., 2005 Subrahmanya, 2007). Hence, SMEs have started to play major roles in most of the economies in the world (Kale et al., 2010; Nieto and Santamaria, 2010; Malik and Nilakant, 2011). In this situation, governments of several countries have started to encourage the growth of SMEs (Bhutta et al., 2008; Kureshi et al., 2010, Nicholas et al., 2011; Awuah and Amal, 2011).

For a very long time, the researchers and practitioners were not concentrating their works and activities on the SMEs. However recently, due to the increased dependence of large size organizations on SMEs, the
researchers and practitioners have started to explore the ways of enhancing the performance of SMEs. Particularly a major section of the researchers and practitioners have been making efforts to identify the deficiencies prevailing in SMEs. However, these deficiencies prevailing in SMEs cannot be overcome within a short period of time. This is due to the reason that, contemporary SMEs are not scientifically managed (Gnanaraj et al., 2010; Malik and Nilakant, 2011). This situation is different in the case of large size organizations. These organizations are scientifically managed in a systematic manner. This strength aids large size organizations to apply numerous competitive strategies like TQM, lean manufacturing and Six Sigma in an effective manner.

A perusal of literature would indicate that significant benefits are reaped by large size organizations by implementing competitive strategies (Furterer and Elshennawy, 2005; Kumar et al., 2006; Thomas et al., 2009). Now a situation has arisen by which, large size organizations would fail to implement the competitive strategies and reap the benefits unless SMEs support these endeavours. This is attributed to the reason that, due to the increase in the outsourcing activities, SMEs have become the backbone of large size organizations. Hence, it is right time that the competitive strategies are implemented in SMEs too. In this situation, it has become imperative to develop models exclusively for the purpose of implementing competitive strategies in SMEs. In this context, DOLADMAICS model was designed during the doctoral work reported in this thesis for implementing Lean Six Sigma in SMEs.

DOLADMAICS envisages the implementation of Lean Six Sigma model in SMEs through five levels while simultaneously developing the scientific management ingredients. After designing the five levels of DOLADMAICS model, the author of this thesis conducted implementation
studies in three SMEs which have been referred to in this thesis as SME-X, SME-Y and SME-Z. The experiences of conducting these implementation studies corroborated the finding of the researches that, contemporary SMEs suffer from many deficiencies. It was a difficult task to overcome these deficiencies during the conduct of the implementation studies reported in this thesis. As mentioned in the previous chapter, though partial implementation could only be exercised, the investigations on the practicality of the first and second levels of DOLADMAICS model were smoothly conducted in SME-X and SME-Y.

In SME-X and SME-Y high employee turnover and insufficient financial fund facility were hampering the actual implementation of the first and second level of DOLADMAICS model. Yet the first and second levels of DOLADMAICS models were found to have the capability of sensitizing and orienting the SMEs towards implementing Lean Six Sigma and thereby acquiring competitive strengths.

In most contemporary SMEs implementation of DOLADMAICS model cannot be smooth as the prevailing deficiencies could act as bottlenecks. This statement is made in the context of the experience gained when the implementation study was conducted in SME-Z. In SME-Z due to lack of management support, the first level of DOLADMAICS model could only be peripherally subjected to implementation study and subsequent investigations covering further levels of DOLADMAICS model could not be conducted. In this background, this thesis is concluded in this chapter by highlighting the contributions of this doctoral work, suggesting the scope for carrying out further research in the direction of implementing DOLADMAICS and discussing the issues to be tackled in contemporary SMEs to successfully implement DOLADMAICS for acquiring competitive strengths.
7.2 CONTRIBUTIONS

The major contributions of the doctoral work reported in this thesis are highlighted here. The information and knowledge gained by conducting the literature survey were used to design the conceptual features of DOLADMAICS model for enabling SMEs to implement Lean Six Sigma in five levels. The framework of each level of DOLADMAICS model and other instruments including project charter and questionnaire were designed.

During the literature survey conducted in this doctoral work, the status of SMEs was studied. This study revealed the prevalence of as many as 25 deficiencies. These deficiencies were ordered according to the frequency of their appearance in literature. The listing and ordering of these 25 deficiencies will be useful to overcome them in stages and thereby engineer the progress of SMEs scientifically for acquiring competitive strengths (Gnanaraj et al., 2010).

The methodologies of implementing the first and second levels of DOLADMAICS model for sensitizing and orienting SMEs towards implementing Lean Six Sigma and thereby acquiring competitive strengths were investigated. The methodologies presented in Chapter 4 and 5 could be utilized by engineers and managers to implement the first and second levels of DOLADMAICS in the contemporary SMEs (Gnanaraj et al., 2010).

The challenges to be faced while implementing the first and second levels of DOLADMAICS model have been pinpointed. The prior knowledge of these challenges will enable engineers and managers to implement the first and second levels of DOLADMAICS model cautiously so as ensure its success in sensitizing and orienting SMEs towards implementing Lean Six Sigma and thereby acquiring competitive strengths (Gnanaraj et al., 2010). These competitive strengths will be reflected in the forms like scientific
management of the organization and overcoming of wastes like over-
production and unnecessary transportation.

On the whole, by carrying out the doctoral work reported in this thesis, the DOLADMAICS model has been contributed which can be applied in SMEs located in any part of the world to implement Lean Six Sigma in them. This claim is made as DOLADMAICS model is incorporated with the facility to overcome the deficiencies which are reported in literature arena by the researchers working on the SMEs situated in several parts of the world (Gnanaraj et al., 2010).

7.3 LIMITATION OF THE CURRENT WORK AND SCOPE FOR FUTURE WORK

As mentioned in the previous section, during the doctoral work reported in this thesis, first and second levels of DOLADMAICS model could be implemented only partially in SME-X and SME-Y. This is a limitation of this doctoral work. In order to overcome this limitation, in future, researchers may strive to implement actually and fully the first and second levels of DOLADMAICS model in SMEs. These investigations will be useful to verify and validate the DOLADMAICS model. The knowledge and experience gained by conducting these investigations may be used to refine frameworks of the first and second levels of DOLADMAICS model and make them practically compatible for implementation in the SMEs. Furthermore, in future, researchers may strive to implement all the five levels of DOLADMAICS model in typical SMEs and investigate the capability of DOLADMAICS in enabling the SMEs towards implementing the Lean Six Sigma. In this endeavour, the future researchers may also identify more deficiencies other than those reported in the doctoral work reported in this thesis. These researchers may design a comprehensive model encompassing these additional deficiencies to enable the contemporary SMEs to implement
Lean Six Sigma. These researchers may also attempt to implement Lean Six Sigma in SMEs using other models contributed by Kumar et al., (2006) and Thomas et al., (2009). The performance of these models can be compared with that of DOLADMAICS. DOLADMAICS is designed by assuming that SMEs are not scientifically organized. In future, researchers may strive to implement DOLADMAICS model in scientifically managed SMEs. The impact of this implementation study may be analysed to draw inferences which will be useful to the practicing engineers and managers. This kind of researches may be carried out by the practicing engineers and managers as this would enable the enhancement of the practical compatibility of DOLADMAICS model.

7.4 CONCLUSION

The literature world has established the importance of the roles played by SMEs in developing the wealth of nations (Beaver and Hutchings, 2005; Prater and Ghosh, 2006; Deros et al., 2006; Todd and Javalgi, 2007; Chiware and Dick, 2008; Singh et al., 2008; Kale et al., 2010; Malik and Nilakanth, 2011). It is also reported in literature that, many countries are coming forward to aid the SMEs for improving their performance to make it equivalent to that of large size organization. In this situation, the need of the hour is to investigate the practicality of implementing competitive strategies like Lean Six Sigma. In this context, the doctoral work reported in this thesis was carried out. This doctoral work has unearthed certain facts.

- The theory behind Lean Six Sigma is not compatible for implementation in contemporary SMEs as it requires high financial investment.
• The theory of Lean Six Sigma is available in literature, but no comprehensive model has been developed (Kumar et al., 2006; Thomas et al., 2009; Gnanaraj et al., 2010).

• The DOLADMAICS model overcomes the deficiencies encountered in SMEs and simultaneously facilitates the elimination of wastes and enhancement of Sigma level of the organization.

• The management commitment is very much essential for successfully implementing DOLADMAICS model.

• A system to record data on defectives will be the backbone of successfully implementing DOLADMAICS model.

On the whole, the experiences of conducting the doctoral work reported in this thesis indicated that there are many complexities to overcome even to initiate the implementation of Lean Six Sigma using DOLADMAICS model. Particularly in this direction, certain mechanisms motivating the SMEs to achieve competitiveness are required to be promoted. Till this happens, it is very difficult to expect SMEs to implement like Lean Six Sigma using DOLADMAICS model for achieving competitiveness and contributing wealth to the nations.