CHAPTER 8

CONCLUSION AND FUTURE ENHANCEMENTS

8.1 CONCLUSION

The proposed research is motivated by the fact that a fine grained measurement framework seems to be a better approach for quantifying and evaluating the MAS performance attributes. From this perception, this research reported is aimed at to proffer software metrics based evaluation framework, which could facilitate the designers and developers to assess the MASs at all required stages. In addition to this, it is also aimed that by proposing a set of new evaluation metrics for MAS, invite the debates and thereby to define the new directions of research in the specified domain in future.

This research advances the state-of- art in a number of significant ways. This work analyzed the MAS’s performance attributes and focus on the science of inter-agent communication and coordination, which plays a key role in MAS based problem solving environments. In this viewpoint, some of the useful communication and coordination oriented metric suites are proposed to assist developers in designing the versatile and adaptive communication and coordination schemes of MASs.

In case of communication oriented metrics models, there are four different dimensions are discussed: Physical Dimension dealt the quantification schemes of physical communicational arrangements between
the member agents of MAS set-up; The Social Dimension dealt the measurement schemes in terms of volume of interactions of the intended agents with the other members of the same MAS, whereas the Relational Dimension dealt the measurement schemes of the agents in terms of volume of interactions with the members of other MAS organizations; The Environmental Dimension dealt measurement schemes of the members of the MAS with external entities of the MAS other than the other MAS organizations. In case of coordination oriented metrics models, there are two different issues are discussed; Social Delegation focused on the metric models corresponds to the efficiency of the agents’ allocation schemes, whereas the Task Delegation focused on the metric models corresponds to the efficiency of the tasks allocation schemes.

These proposed measurement schemes can play a decisive role for developing refined designs to maintain the optimized performance in any MAS organization set-up. The experiments carried out in this research support the proposed metrics models and proved that same may also serve as the decisive role for estimating and enhancing the performance of the overall MASs.

8.2 FUTURE ENHANCEMENTS

This work outlines the quantitative justification theory that precisely explained why metrics based performance evaluation models are well suited for MASs. These observations can motivate to develop the metrics models for other MAS hierarchies like collaboration, cooperation, etc… On the other hand, the definitions and measurement schemes offered in this work concentrated on generic, rather than the application specific, and so that they can be extended in this direction of research.