CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

The objective of this research is to propose service oriented based design and implementation model that enables interoperability among business value chain activities of enterprise systems, which can fulfill the need of any small and medium enterprises. This research has fulfilled this objective by outlining the design and implementation of the proposed model. In this chapter, the entire work is summarized which consists of the results obtained after various experiments to estimate reliability, ranking of services, challenges encountered during the research stages, limitations and future enhancement.

7.2 Results and Findings

Generalized model for integration of business values chain activities has been proposed. Three distinct soft computing techniques have been used to evaluate the proposed model in different perspective, i.e. for reliability estimation, FIS and ANFIS is used; for ranking of services TOPSIS has been used. Results obtained from are various experiments are very effective and prove that the proposed method produces satisfactory results for all the cases.
7.2.1 Reliability Estimation of the Model

Our experiments simulated the effect of rules with the MATLAB fuzzy logic toolbox; the reliability for the values obtained was found to be very close to the calculated value, thus justifies that proposed approach give accurate estimates. Results also show that the ANFIS improves the reliability evaluation of the FIS technique.

7.2.2 Optimal Ranking of Service Composition

The fundamental part of this work is execution of services in an optimal way based on defined set of criteria. The chapter 6 discussed a numerical example and the experimental results indicate the validity and efficiency of the proposed approach. Work done in this experiments provide useful contents for those who are interested to identify services composition to support business to business or enterprise application integration in optimal way based on some defined criteria.

7.2.3 Adaptability of the Proposed Model

On the basis of experiments done, it is found that the proposed architecture is suitable for integrating business activities in SMEs. Thus, the proposed architecture is capable to deploy at all kinds of SMEs, as it is a generalized model. Result obtained after applying the following approaches are as follows:

- **Factor Rating Method** - The analysis on identified factors clearly shows that model is readily adaptable and is much efficient than traditional ERP approach. It is readily deduced that traditional ERP systems involve higher levels of difficulty when analyzed in terms of agility, adaptability and availability.
• **Testing the hypothesis** - The sample questionnaire is prepared based on proposed model and then the response is taken from industry person to evaluate it. The responses were analyzed and calculated, it is found that the proposed architecture is very suitable for the integrating business activities in SMEs. Hypothesis is accepted at 5 percent level of significance and it is concluded that the sample data indicates that proposed integrated SOA model is more efficient in terms of cost and adaptability than traditional ERP systems.

7.3 **Challenges Encountered**

Due to lack of knowledge in the business processes, defining the project scope was very complicated task. The scope of business values chain within a system could be very wide; there are too many modules and defining which modules have similar application domain is difficult. Researchers experienced much difficulty in identifying which of the integrated system features are essential, either desired or optional. In order to cope up with this problem, resources like newsletters, forums, and magazines were consulted. Discussion held and feedback has taken from managers, programmers, project leaders, software engineers etc., and post question to online forums. Thorough survey had given opinions from respondents who are direct or indirect involved in the process of the research domain. Fortunately, the responses are adequate to come up with the scope of the proposed research.

7.4 **Strengths of Proposed Model**

The design and implementation of the integrated system, provides the following contributions:
1. It enables the conceptual level service sharing for independent business value chain activities of an enterprise system.

2. Integration model can be implemented by using independent technologies such as web services that are mainly used for realizing service oriented architecture. Hence, the model encourages more secure, reliable and transacted integration domain.

3. Common business processes or service sharing could be widely applicable to different kind of industries and market. The architecture provides support for open business standard.

4. It provides guidelines to software maintainers, managers, system administrators, and developers to construct an integrated and conceptual equivalence applications environment.

5. Reliability testing of the model has been well elaborated along with mapping of each layer modules with prospective technology.

6. The primary beneficiaries of this work would be the small and medium enterprises that are investing into the IT with an expectation of good results but within the constraints of limited budget.

7.5 Limitations

Due to complexity of service sharing concept for isolated systems, model does not reflect all sub-systems of ERP, CRM and SCM. This research focuses on the issues of interoperability among the sales and distribution (SDS) of ERP, customer service and support (CSS) of CRM, and e-procurement system (EPS) of SCM. In present work, theoretically the critical success factors have been identified. All services and concepts are configured and stored in data store within Bizagi
module. Practical implementation testing and how the complexity of entire services mapping could be handled, is left for future work.

7.6 Future Enhancements

This research has fulfilled the objectives by outlining the design and implementation of the proposed model. However, there is a scope to improve and further enhance the proposed integrated SOA model. Following are the possible areas for enhancement:

- To support conceptual and service mapping between unlimited modules of business value chain activities such as financial management, human capital, product lifecycle, field service management, and enterprise asset management system etc.
- To investigate the possibility of improving the performance of the integrated system to handle a huge number of requests at the same time.
- To address the security of service sharing activities to prevent unauthorized invoked of the services.
- Some other important parameters can be chosen for the purpose of reliability estimation through fuzzy inference system.
- Some more criteria’s can be chosen for the purpose of optimal service composition through fuzzy TOPSIS.

7.7 Conclusion

Throughout the research survey, design and implementation, it is believed that the all goals as outlined in chapter 1 are achieved. With the advent of proposed model, most of the interoperability problems at conceptual level could be overcome.
The successful simulation of integration among business value chain activities by using the service-oriented methodology can be served as guidelines for system stakeholders to obtain integrated and accuracy output information. Hence, this report could be referred to as an advance research for service-oriented integration technology. Experience documented in this research will be helpful for practitioners in collecting the data necessary for design and implementation of service oriented applications.