7. CONCLUSIONS

The current research accomplished the integration of Lean and SixSigma methodologies in an IT Services context to achieve the benefits of both Lean and SixSigma for software development life cycles.

The integration is achieved through combining the various phases of Lean philosophy with DMAIC methodology majorly practised as a SixSigma method. The overlap between Lean and SixSigma is significant as they both have the goal of improving performance, as with reducing cycle time and reducing variation. Lean Six Sigma integration will provide IT organizations, tools and a framework to address the major concern areas and inefficiencies in processes and systems and solve these for a competitive advantage. Lean SixSigma is expected to reduce waste and costs while simultaneously improving speed, quality, and flexibility – all of which can enable competitive advantage.

After successful integration of Lean and SixSigma, the study attempted two different scenarios one for a full software development life cycle and the other for a Technical support scenario.

The first case elicits that Integrated Lean SixSigma can be implemented for a full life cycle software development for continuous improvement. The first case has empirically brought out cycle time reduction and defect reduction, attributes of integrated Lean SixSigma, deriving considerable financial benefits to the organization as given in detail as part of Chapter 6 in this research study. This study elicits the benefits of Lean Sixsigma implantation in terms of reducing operational costs without impacting the quality of customer service. In this study, the benefits achieved are:

- cycle time reduction the order of 10-12 %
- reduction of the defect density by 32%.
• financial savings of over US$ 20,000 annually

Cycle time reduction helps to improve the response to customer calls and thereby customer satisfaction levels have improved. The defect reduction of the deliverables improves the quality of the product. The reduction of timelines, thereby effort helps in operational efficiency resulting in financial savings.

The second case demonstrates the use of integrated Lean SixSigma implementation for continuous improvement in an application support scenario over an ITIL process. As detailed in Chapter 6, the implementation enhances the quality of the technical support through defect reduction thereby team optimization resulting in financial benefit. The non-value added activities are removed through identifying the waste and removing them. Overall team reduction resulted in a financial saving of US$ 288,000 per annum. Lean SixSigma thereby helps in improving efficiency, reducing costs and enabling process flexibility which in turn helps in improving customer satisfaction. Without a clear understanding of customer’s requirements, a new product developed or service rendered is bound to fail.

Both these cases are empirical and have brought out quantifiable improvements through effective implementation of the Integrated Lean SixSigma in a continuity-change paradigm. Though, this study focused on the subject of applying Lean SixSigma to software development and application support; there are many other potential areas such as Software Testing which warrants future research to investigate the consistency of the continuous improvement and effectiveness of a Lean SixSigma strategy in a flexible framework. This framework studied here could be extended for these areas by future researchers. Thus the combination of Six Sigma and Lean for IT services—with their tools, road maps, and management processes— is essentially a carefully managed process for systematically scheduling and carrying out software projects that can be taught, learned, and performed with a high degree of success to achieve operational excellence.

Moreover, the current study demonstrates that Lean SixSigma facilitates properly architected and managed, operational excellence which can achieve significant and measurable performance improvements by focusing on the levers that improve flexibility and speed to market, quality and
reliability, and customer value. Merging the advantages of speed and reliability, the productivity level could be considerably improved and cycle time is considerably reduced. These significant returns highlight the power of the Lean SixSigma approach.

The present study brings out the customer centricity of Lean SixSigma where it focuses on the customer priorities, requirements and expectations in order to minimize any cost that does not add value from the customer’s perspective. The value creation will be in from a customer perspective and business perspective. Customer value-add implies all the tasks and processes which are vital to deliver a service to the customer. It can be a feature or a service that the customer is willing to pay. It can be a function that provides a competitive advantage to the customer or it helps on-budget, on-time, and on-quality delivery of the product or a service. Business value-add denotes an activity which attributes to productivity improvement, enhances process efficiency or addressing statutory requirements. Non-value-add – an activity not required to meet customer needs or run the business. Any activity that does not add value in a process will increase the cycle time and any increase in cycle time adds to the effort and hence cost. By removing the cause of long cycle time, the associated cost can be controlled. Cycle time, hence, can be treated as a global parameter for corporate efficiency and a way for reducing cost. Hence, Lean SixSigma is a methodology to reduce costs without impacting the customer requirements.

The scenarios which can be attempted for future research are software maintenance, software testing, and improvements over agile methodologies. The software development scenarios are continuously changing and it is imperative to address varying customer needs, process improvements are essentials for achieving operational efficiencies.

Areas such as mobile computing are leaving personal computing innovations. Most of the innovations in computing is happening around Mobile cloud computing and context aware computing. However, the software development in this space is very costly and conventional software development is time consuming. Hence, there is a want of new methodologies such as Integrated Lean SixSigma and is of interest to research community as this area is unexplored in an IT services context. The present research demonstrates that the conceptual framework of
change-continuity dichotomy as in Lean and SixSigma methodologies can be effectively integrated and can yield commercial benefits to the IT services projects in practice.

The present study validates the benefits of combining Lean and SixSigma. The Lean SixSigma integrates two powerful methodologies for continuous improvement. Lean helps in significantly reducing lead times and eliminating wastes in the process without compromising quality or customer satisfaction. SixSigma focuses on sustained improvement through a quantitative approach using tools and guidelines eliminating defects thereby enhancing quality resulting in customer delight. Thus, Lean SixSigma enables value creation by addressing efficiency (helps operating income growth) and delivering what matters to customer in a repeatable manner by reducing variation (helps revenue growth) thereby enhancing customer delight and shareholder value.