

Nagelkerke's  $R^2 = 0.602$  indicates that the model explains that 60% of the variation in the outcome has been described by the model. It is a good and acceptable level to continue examining the regression results further.

The value of  $VIF=1.57$  has been calculated by Nagelkerke's  $R^2$ .  $VIF < 5$  shows that multicollinearity does not affect the model.

**Table 3.4 Model Fitting Information- Performance Measures**

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	287.180			
Final	188.663	98.516	33	0.000

The Model Fitting information told that there was a highly significant reduction in the chi-square statistics ( $p < .005$ ), so the model is a substantial improvement over the intercept-only model.

The Parameter estimates table is the core of the output, telling explicitly about the relationship between our explanatory variables and the outcome.

Dependent variable: "Overall successful rate of Process Excellence Program" (to understand which attributes are the key drivers of Successful rate) (actual scale value, 5 points)

Independent Variables: "Performance measures of Process Excellence Program" (actual scale value of the attributes, 5 points)

As per regression analysis, the top 15 relative importance of performance measures that drive the overall success rate of the PE Program implemented in the organization are the following:

1. Reduction in cost-effectiveness value-added.
2. A decrease in the per-unit cost of manufacturing.
3. Increase in an organization's profits.
4. Increase in employee involvement in the problem-solving process.
5. Reduction in Process Cycle Time.
6. Increase in Return on investment.
7. Increase in the organization's turnover.
8. Increase in Market share.
9. Increase in employee satisfaction with their work profile.
10. Improvement in per-employee productivity.
11. Increase in On-time performance.
12. Improvement in Sales.
13. Improvement in logistics system planning.
14. Improvement in Customer satisfaction.

15. Increase in employee satisfaction with support and facilities offered at the workplace.

The study concluded that the Theory of Constraints, Lean and Six Sigma have limitations when used as standalone techniques and demonstrated how the Integrated Theory of Constraints, Lean, and Six Sigma techniques could produce superior business results combined by covering the productive areas from all these techniques. The results of the Chi-square p-values indicated that each technique's weakness complimented the strengths of the other technique. Therefore the alternative hypothesis can be accepted that a relationship does exist between the integration of the Theory of Constraints, Lean, and Six Sigma to achieve superior business results.

The study has demonstrated that the sample organizations find it challenging to maintain the transition from theory to practice regarding Constraints, Lean and Six Sigma implementation. That has been shown in the empirical analysis where the Theory of Constraints, Lean, and Six Sigma organizations only practice specific tools and techniques. Every organization has claimed to improve the system, but there are still opportunities to improve its performance. Therefore, it is recommended that managers in the Indian manufacturing business environment have structured follow-up mechanisms to ensure the sustainability of their improvement systems to lead to predictable results. The improvement areas identified in the study provide managers in the Indian manufacturing sector to monitor and measure the current improvement processes on the shop floor.

In conclusion, the present study emphasized and enforced that in an increasingly competitive and globalized environment, the impact of the Integrated Theory of Constraints, Lean, and Six Sigma on organizational performance measures is superior to any previous quality improvement programs.

**4. Conclusion**

The study attempts to identify possible shortcomings of existing continuous improvement techniques used in Indian manufacturers and provide critical success factors using the Integrated Theory of Constraints, Lean and Six Sigma to assist them in exceeding overall business excellence. It is anticipated that the result of the present study will serve as a proposal detailing a customized implementation framework for Indian manufacturers to become more competitive and contribute to the country's economy. The present study is significant to Indian manufacturing organizations as it considers these needs and tries to fulfill them.

Further, a theoretical model for integrated Process Excellence methodology implementation is developed

based on a literature review. The theoretical model has been empirically tested after hypothesis testing. Thus the model is validated and can be used by organizations planning to implement the Theory of Constraints, Lean and Six Sigma, or integration. The research provides insight to top management to prepare the organization for implementing the Process Excellence methodology. It also guides management in selecting a combination of PEMs. As per present research to achieve process excellence and improve its performance, management shall give more attention to said nine success dimensions of Process Excellence methodology implementation.

The study presented an Integrated Theory of Constraints, Lean and Six Sigma framework based on critical factors that emerged from the literature and the analysis of qualitative and quantitative research findings. The Integrated Theory of Constraints, Lean, and Six Sigma framework is expected to help organizations achieve world-class levels. It revolves around a balanced approach to business improvement using underlying problem-solving and approaches to continuous process improvement. It forms a robust business strategy that can help Indian manufacturers become the very best in confronting global challenges.

Although the study produced valuable and interesting findings, it is understandable that there are inherent limitations that are likely to surface with any research project and could present avenues for future research.

Upon reviewing the study's limitations, many areas are identified that need to be investigated and enhanced. These areas provide further opportunities for potential future research activities and are thus recommended as follows:

- If a similar study will be performed in a different industry, it can determine whether other areas in India face similar challenges as those in the manufacturing industry. The suggestion for future work will also test and establish whether the findings are similar to other sectors with those of this study.
- Conducting a more detailed study through a more substantial sample group with various available resources and more organizations' involvement in the immediate future will provide greater validity of the findings from the research. That would ensure more rigorous conclusions which can be drawn from the study.
- As reflected in their annual reports, the impact of PEM implementation on the balance sheet of companies can be a separate subject for future research. Government policies and initiatives also influence the Indian manufacturing sector. The

government of India is encouraging the practice of Lean Manufacturing in Indian organizations. The recent initiative taken by the government is "Make in India." The present research has not covered this aspect of process excellence methodologies. Future studies can be done to study whether there is any relation between government policies and the adoption of process excellence methodology by Indian manufacturing organizations.

## 5. Recommendations

The section highlights the recommendations based on the study about the research undertaken within organizations in the Indian manufacturing sector.

The organizations pay closer attention to the following improvement opportunities for each of the nine critical success factors. It will serve as the checklist to improve the current manufacturing processes within the organization under study. It is anticipated that once practical corrective actions are taken for the problem areas identified, it will be easier to implement the Integrated Theory of Constraints, Lean and Six Sigma framework.

- Enhanced motivation and responsibilities among the employees for inter-departmental coordination and improved interaction between management, employees and process;
- Increased employee's participation in problem-solving, and strategic thinking throughout the floor of organization and building of continuous improvement culture across the organization;
- Product flow will balance and add more value in continuous improvement so that working processes will not wait unnecessarily for material in production; provision of using of statistical process control and pull production systems will ensure complete control of the entire production system on the floor to reduce process defects and possibly eliminated if immediate corrective action has been taken;
- Quality-driven structured system; enhanced improvement opportunities through proper evaluation and measurements of the value stream; "Single-Minute Exchange of Dies (SMED)" technique will provide rapid change-over of tooling and fixtures;
- Enhanced logistics management system for facilitating success by uninterrupted flow and coordinating the inventory control and operational activities;
- Encouraging employees to learn new skills and abilities to make them certified multiskilling employees; developing trust in employees, and