

# Lean and Six Sigma Integration: An Overview

Man Mohan Siddh Neeraj Saini

**Abstract** — The basic continuous improvement methodologies for attaining operational in addition to service excellence in organization are Lean and Six Sigma. The aim of this paper is to liken lean and Six Sigma and discuss the advantages of integration. To give an enhanced method to continuous improvement, a new thorough description for merging Six Sigma and lean is established.

**Index Terms** — Lean, Six Sigma, Lean Six Sigma

## I. INTRODUCTION

Six Sigma is used to improve processes, but a Lean approach is intended to increase the flow and speed of operations by decreasing or eliminating waste. Both Six Sigma and Lean approaches involve "data collection and analysis to improve the organizational performance". It is also known as Lean Six Sigma and Lean Six Sigma DMAIC in the literature. Combining Lean and Six Sigma techniques can help organizations improve operational efficiency as well as higher product or service quality. According to certain studies, combining Lean with Six Sigma is a highly effective method (Powell et al., 2017).

## II. LITERATURE

The Lean concept tries to decrease seven categories of waste: inventory, overproduction, motion, transportation, waiting, defect and over processing, and (Herron and Hicks, 2008). Six Sigma, on the other hand, is a data-driven method to eliminate variation. The DMAIC cycle gives an organized

approach to improvement efforts and can greatly enhance organizational performance (Araman and Saleh, 2023). Researchers use Lean Six Sigma for improvement efforts because they believe it can be implemented across industries and organizations. As a result, the Lean Six Sigma integrated improvement technique was developed.

## III. LEAN SIX SIGMA

Six Sigma consists mostly of the "DMAIC" methodology as Define, Measure, Analyze, Improve, and Control. As a result, the entire manufacturing process is separated into these five stages. Each phase includes research, which leads to process improvement. Recently, researchers combined these two rigorous approaches to examine the compatibility of objectives and goals and to broaden the scope as well. Six Sigma attempted to use lean tools in each phase of DMAIC methodology. As a result, this integration became one of the most effective waste reduction strategies in business organization. Nowadays, practically every firm, regardless of product or service, attempts to implement Lean Six Sigma to increase business efficiency.

## II. CONCLUSION

Lean Six Sigma is a popular methodology that gives a disciplined and structured approach to managing, improving, and solving potentially difficult problems. It is a synthesis of the lean and Six Sigma ideas. Lean thinking primarily focuses on increasing customer value by optimizing and smoothing

Man Mohan Siddh, Department of Mechanical Engineering, Jaipur Engineering College and Research Centre, Jaipur, India  
Neeraj Saini, Department of Mechanical Engineering, Arya College of Engineering & I.T., Jaipur, India, (e-mail: neerajsaini.engg@gmail.com).

process flow and eliminating waste. Six Sigma is primarily concerned with finding and eliminating any source of variation in the process.

### REFERENCES

- [1] Powell, D., Lundeby, S., Chabada, L., Dreyer, H. (2017), "Lean Six Sigma and environmental sustainability: the case of a Norwegian dairy producer", *Int. J. Lean Six Sigma*, Vol. 8 No. 1, pp. 53–64.
- [2] Herron, C. and Hicks, C. (2008), "The transfer of selected lean manufacturing techniques from Japanese automotive manufacturing into general manufacturing (UK) through change agents", *Robotics Computer Integrated Manufacturing*, Vol. 24 No. 4, pp. 524–531.
- [3] Araman, H., Saleh, Y. (2023), "A case study on implementing Lean Six Sigma: DMAIC methodology in aluminum profiles extrusion process", *The TQM Journal*, Vol. 35, No. 2, pp. 337–365.