Chapter 2
Guiding Lean Six Sigma in the Quality 5.0 Era: Empowering Employees, Human-Centric Leadership, and Effective Change Management

Mahipal Singh
https://orcid.org/0000-0002-0647-2637
Lovely Professional University, India

Mukhtiar Singh
https://orcid.org/0000-0002-2915-034X
Lovely Professional University, India

Rekha Goyat
Lovely Professional University, India

Guravtar Singh Mann
Lovely Professional University, India

ABSTRACT

The present research aims to integrate Lean Six Sigma (LSS) within the Quality 5.0 paradigm, with a particular focus on human-centric leadership, employee empowerment, and structured change management. This study was conducted using a comprehensive review of quality management evolution from Quality 1.0's to 5.0's technologies to the emerging emphasis on sustainability and ethics. As an outcome of this work, a conceptual framework was proposed to integrate the DMAIC with Q5.0 principles. The framework identifies specific mechanisms for embedding employee engagement and inclusive leadership practices into each DMAIC phase

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and proposes metrics for assessing both process performance and human-centric outcomes. The findings suggest that organizations can enhance operational effectiveness and innovation by combining data-driven process controls with strategies that promote autonomy, collaboration, and continuous learning. This research guides practitioners in designing the policies and formats in the context of technical rigor with ethical and cultural considerations.

1. INTRODUCTION

Aiming for operational excellence and customer satisfaction, Lean Six Sigma (LSS) is a widely adopted methodology that combines Lean principles focused on waste reduction with Six Sigma's emphasis on minimizing defects and process variation. LSS combines the precision of Six Sigma's data-driven, statistical methods with the efficiency-enhancing techniques by Motorola in the 1980s and subsequently supported by General Electric (Singh, Rathi, Jaiswal, et al., 2022). The framework mostly makes use of the DMAIC (Define, Measure, Analyze, Improve, Control) model, a methodical approach for spotting inefficiencies, root cause analysis, application of enhancements, and preservation of best results. Lean Six Sigma has been effectively used in manufacturing, healthcare, finance, and services. Companies use it to simplify procedures, raise standards, and provide customers more value (Singh et al., 2023). Its adoption is driven by documented performance improvements such as cost savings, improved cycle times, and higher product quality which support a firm's competitive positioning (Singh et al., 2019).

Lean Six Sigma also encourages a culture of ongoing development, so enabling staff members to participate in process optimization and problem-solving, so fostering greater teamwork and creativity. Lean Six Sigma offers a scalable and practical structure to handle operational difficulties. It enhances the process flows, and propel long-term success as companies negotiate ever complicated and fast-paced markets (Singh et al., 2021).

Moreover, the inclusion of Lean Six Sigma projects into human-centric leadership projects becomes ever more crucial. Lean Six Sigma promotes technical excellence and great employee engagement by giving staff involvement, organizational culture, and leadership that inspires cooperation and innovation top priority (Singh & Rathi, 2022). Lean Six Sigma's relevance in the modern corporate environment has been reinforced by this move toward employee empowerment and leadership that emphasizes people's involvement. Thus, it enabling organizations to maximize operations and simultaneously improve workforce morale and general satisfaction (Singh & Rathi, 2021).