

A Multi-case Study on a Comprehensive Model for Sustainable Lean Implementation: Integrating Phases, Practices, and Critical Success Factors

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Abstract:

This study aims to propose a comprehensive model for sustainable lean implementation in organizations by integrating key dimensions: implementation phases, Lean Practices (Lean Technical Practices – LTP, and Lean Social Practices – LSP), and critical success factors. The study also includes a multiple-case study with 13 Brazilian organizations from different sectors that have been applying lean for over five years. Data collection involved structured interviews, which were transcribed and coded to identify patterns of behavior. The research identified three sustainability lean approaches: (i) isolated continuous improvement actions, focused on solving specific problems; (ii) structured continuous improvement programs, incorporating methodologies such as 5S, Kaizen, and Six Sigma; and (iii) excellence programs, embedding lean as a fundamental part of organizational management. Findings suggest that LSP, such as leadership, training, and empowerment, play a more critical role in lean sustainability than LTP. It was also found that organizational, strategic, financial, and process- and people-related factors directly influence lean implementation. Moreover, the study highlights the importance of a dedicated continuous improvement sector to sustain lean initiatives over time. Unlike previous studies that analyze lean phases, practices, and influencing factors separately, this research proposes an integrated model linking these dimensions. Additionally, it introduces a maturity classification framework, helping organizations assess their lean progression and identify improvement opportunities. The study also challenges the traditional sequential lean implementation models by proposing a cyclical and adaptive approach aligned with organizational realities. The research is limited to 13 organizations, predominantly from Brazil, which may restrict the generalizability of the findings. Further studies could expand the sample and explore cross-industry comparisons. The model serves as a practical guide for companies at different stages of lean adoption, supporting decision-makers in designing sustainable lean strategies. The study also provides insights for developing benchmarking frameworks to assess and enhance lean maturity. By reinforcing leadership and engagement, the study contributes to a more participative and people-

centered lean approach, fostering a continuous improvement culture that enhances employee satisfaction and organizational resilience.

Keywords:

Lean implementation, sustainability, phases, practices, factors, Lean Social Practices and Lean Technical Practices.