
Guest editorial: Operational excellence methodologies in Portuguese and Brazilian organisations: an overview

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257

This special issue, entitled “Operational Excellence Methodologies in Portuguese and Brazilian Organisations”, is published in the *International Journal of Lean Six Sigma*. This special issue consists of 12 scientific articles exploring the Lean Six Sigma philosophy as one of the Operational Excellence (OpEx) models (Sá *et al.*, 2022), with a specific focus on companies in Portugal and Brazil.

This topic is particularly relevant for organisations and communities today, given the current VUCA (Volatility, Uncertainty, Complexity and Ambiguity) environment in which ourselves are living due to the expected global industrial crisis scenario, in addition to the challenges of sustainability (Silva *et al.*, 2022; Silva and Gouveia, 2020) and Industry 4.0 (Santos *et al.*, 2021) that organisations must adopt.

Rising production costs, resource scarcity, supply chain problems and economic pressures have forced companies around the world to rethink their operational strategies (Garcia-Buendia *et al.*, 2024). In this context, OpEx has emerged as a strategic imperative to improve organisations’ sustainability and competitiveness (Sá *et al.*, 2023; Silva, 2024). There are currently several OpEx models such as the Shingo Model (Kelly and Hines, 2019), EFQM Model (Fonseca, 2022), Malcolm Baldrige (Lapoint, 2022), Toyota Production System (Palhau *et al.*, 2024), Lean Six Sigma (Skalli *et al.*, 2024), World Class Manufacturing (Flynn *et al.*, 1997), among others.

The Lean Six Sigma OpEx model is one of the proven OpEx models helping organisations meet these challenges. It integrates the concept of waste elimination (lean) (Kaur Paposa *et al.*, 2023) with the analytical approach of Six Sigma (quality control) (Gijo *et al.*, 2021). This integrated approach enables organisations to improve their processes, reduce costs and increase efficiency. Lean Six Sigma promotes a culture of continuous improvement, providing teams and leaders with the agility and organisation needed to deal with uncertainty and change management in a flexible and systematic way (Sordan *et al.*, 2024).

This special issue not only presents several cases of Lean Six Sigma implementation in Portuguese and Brazilian organisations in different sectors of activity, but also addresses the contributions of Lean Six Sigma to Sustainability and Industry 4.0. In this way, it aims to make a strong scientific contribution to both business practice and the scientific community. The articles have been carefully selected and organised so that this special issue can provide pragmatic solutions to specific challenges and stimulate research and academic discourse on the contributions of Lean Six Sigma as an operational excellence model to the long-term success of organisations. This collaborative effort aims to help organisations navigate through VUCA times and ensure their continued competitiveness and resilience on the global stage. The 12 articles in this special issue cover a wide range of topics related to the



“During the collection of articles for this Special Issue, its scope was expanded to the Brazilian reality, which, although not exactly the same as the Portuguese, has strong cultural affinities. The Guest Editors warmly thank their Brazilian Colleagues for their collaboration”.

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implementation of Lean Six Sigma. There are case studies, research and analyses showing how this OpEx model has been used to solve complex problems and achieve real results in organisations. They also show how Lean Six Sigma can be applied in practice and how well it can work in the current global economic and social environment.

Here is a quick summary of what each article in this Special Issue is about:

- *“A proposed conceptual model for linking lean thinking and project management in the IT sector”*: This article explores the application of lean thinking in project management as a strategy to reduce waste, prioritise value delivery and increase project efficiency. To validate a previously developed conceptual model, a qualitative analysis was carried out based on structured interviews with project managers and IT professionals. The analysis identified sources of waste, assessed their impact on efficiency and analysed the viability of the model in projects within the sector analysed.
- *“A Business Process Management life cycle framework for continuous improvement towards operational excellence: lessons learned from a longitudinal study in a Brazilian Organisation”*: This study proposes a Business Process Management (BPM) framework that integrates the design, implementation, use and evaluation of processes, with a view to continuous improvement and operational excellence (OpEX). It presents a comprehensive model that identifies the critical success factors in each phase of the BPM life cycle, such as strategic alignment, top management support, collaboration, appropriate methods and attention to organisational culture. The importance of initial analysis for effective BPM development and the evaluation and improvement phase as a response to the dynamism of the organisational environment is also highlighted.
- *“Lean manufacturing for reducing lead time in foundry processes: a design science approach”*: This study considers lean manufacturing to be a highly effective methodology with wide applicability to any industrial sector. It is ideal for optimising production processes, meeting customer demands and eliminating waste. The article aims to present and evaluate a generic project-based framework based on the principles of lean manufacturing, with an emphasis on reducing waiting times in foundry processes. The proposed structure has been developed based on the design science research methodology, with the objective of offering a practical and efficient solution for minimising waiting times in these processes, thereby promoting continuous production improvement.
- *“Combining Lean Six Sigma and agile approach to optimise order management: action research in a Brazilian company”*: This article evaluates the combination of Lean Six Sigma and Agile methodologies to optimise order management processes in the seed industry. The study is based on a case study in a Brazilian multinational company and describes the application of the DMAIC cycle (define-measure-analyse-improve-control), with each stage of the process associated with an agile sprint. The process is structured by sequential activities, which are monitored by management systems and software. Performance metrics are collected continuously, including cycle time, number of employees and volume of orders.
- *“Lean health care applied in emergency services: an empirical evaluation”*: This study uses the SMED method to evaluate preparation time management in 24-hour Emergency Care Units (ECU). A total of 1,098 reports in A3 format were analysed, organised into three categories of analysis using Bardin’s methodology. The results

of the study underscore the implications of SMED for optimising preparation time in these units.

- *“Adapting and Validating the EPLIT for Assessing Lean Healthcare Maturity in Brazilian Hospitals”*: This article aims to evaluate the measurement properties of the Employee Perception to Assess the Lean Implementation Tool (EPLIT) in the Brazilian hospital context. To this end, a cross-sectional study was carried out in two hospitals, following the guidelines of COSMIN (CONsensus-based Standards for the selection of health Measurement Instruments). Exploratory factor analysis and Cronbach’s alpha coefficient were used to assess the construct validity and reliability of the instrument.
- *“A framework to assess Industry 4.0 readiness in Brazilian small and medium service enterprises”*: This article proposes a framework for the assessment of the readiness of small and medium-sized Brazilian service companies to adopt Industry 4.0 technologies. The objective of this framework is the improvement of process efficiency without the necessity of major investments. The article presents two applications for the assessment of the level of readiness, with the emphasis that planning and evaluation are of equal importance to implementation. The study observes that extant literature focuses more on the maturity of companies, rather than offering operational steps or decision support, which are essential for the successful adoption of I4.0 technologies.
- *“The use of Virtual Reality as e-training tool for dies’ changeover in stamping presses: a case study on automotive industry”*: This study explores the use of virtual reality as a training tool during a company’s relocation, assessing its impact on quality assurance and reducing machine downtime for training purposes. Employing an action research strategy, two complete cycles were carried out, covering the stages of diagnosis, planning, implementation, evaluation and learning specification.
- *“Lean transportation tools towards waste reduction and digital transformation in the offshore industry: an action-research”*: This study investigates the implementation of lean tools in the domain of road transport within the offshore industry. The primary objective of this investigation is the reduction of waste and the promotion of digital transformation. The research methodology encompasses a multi-method approach, incorporating a scoping review, focus groups and participant observation. The study is conducted within the supply chain of a prominent oil and gas company.
- *“Exploring lean manufacturing impact on sustainable performance in automotive companies in Brazil”*: This article explores the correlation between sustainable lean manufacturing and performance in the Brazilian automotive sector, underpinned by the three pillars of sustainability (triple bottom line): economic, social and environmental. A series of six hypotheses were formulated and subsequently tested, with the analysis of 127 responses collected via structural equation modelling. The findings of this study demonstrate that the implementation of sustainable lean manufacturing practices results in substantial enhancements in environmental, operational and social performance. Furthermore, the study sheds light on the intricate interplay between the three pillars of the triple bottom line.
- *“Lean production, green supply chain management and environmental performance: A configurational perspective based on the Portuguese context”*: This study analyses the integration of lean and green supply chain management (GSCM) practices to achieve high environmental performance. The research, based on data from Portuguese companies in the industrial sector, applies fuzzy set qualitative comparative analysis to identify synergistic combinations of these practices that lead to superior environmental results.

- “Analysis of barriers for Performance Measurement System effectiveness in a company: perceptions across hierarchical levels”: The present study has been conceived with the objective of ascertaining the perceptions of employees at a Portuguese company with regard to the primary barriers to the effectiveness of the performance measurement system (PMS). Furthermore, the study examines how these perceptions vary according to factors such as hierarchy, education, shift, gender and department. The research collects data through structured interviews and questionnaires with Likert scales, and the results are examined using descriptive statistical analysis and the chi-squared test.

These works show how the authors are committed about making academic knowledge better and providing practical solutions for organisations that seek to be the best. The different sectors and approaches in this book show how Lean Six Sigma can be used as an OpEx model in different types of organisations. In a time when efficiency and resilience are essential for business survival, Lean Six Sigma is a must. It gives the tools to deal with tricky problems, helps adapting to market changes, make the most of their limited resources and make sure that companies can survive and thrive in the long term.

We would like to thank the authors for their high-quality contributions, the reviewers for their meticulous insights, the editorial team for their invaluable support in producing this special issue and the Editor-in-Chief of the *International Journal of Lean Six Sigma*, Jiju Antony, for all his valuable support and guidance in preparing this special issue. We hope that the articles presented here will inspire new research and practice in Lean Six Sigma and Operational Excellence models, promoting sustainable development and competitiveness in organisations in Portugal, Brazil and all other countries around the world.

We hope you enjoy the reading experience.

José Carlos Sá

School of Engineering, Polytechnic of Porto, Porto, Portugal and LAETA – Associate Laboratory for Energy, Transports and Aerospace, Porto, Portugal

Francisco Silva

School of Engineering, Polytechnic of Porto, Porto, Portugal and INEGI – Institute of Science and Innovation in Mechanical and Industrial Engineering, Porto, Portugal

Jose Dinis-Carvalho

Production and Systems Department, University of Minho, Guimaraes, Portugal

Gilberto Santos

Polytechnic Institute Cavado Ave, Campus do IPCA, Barcelos, Portugal, and

Luis Miguel Ciravegna Martins da Fonseca

School of Engineering, Polytechnic of Porto, Porto, Portugal and LAETA – Associate Laboratory for Energy, Transports and Aerospace, Porto, Portugal

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