

Critical Success Factors for Implementing Operational Excellence in Morocco's Automotive Industry

Mohammed Hamoumi¹, Mariam Benhadou², and Abdellah Haddout³

^{1,2,3}Industrial Management and Plastics Forming Technology Team

Mechanics, Engineering and Innovation Laboratory, LM2I

National High School of Electricity and Mechanics

ENSEM- Hassan II University

Casablanca

Morocco

hamoumi@gmail.com, mariambenhadou@yahoo.fr,

abdellahhaddout@yahoo.fr

Abstract

Operational Excellence (OpEx) has become a cornerstone of modern industry, prompting numerous manufacturing companies, particularly in the Moroccan automotive sector, to adopt it to optimize costs and maximize profits. However, the lack of prior studies on OpEx implementation often leads to significant obstacles. This research aims to identify the critical success factors (CSFs) for implementing OpEx in Moroccan automotive companies. By doing so, it seeks to maximize the chances of success and evaluate the impact of OpEx before its widespread deployment. Based on theoretical and practical knowledge of OpEx CSFs and considering cultural factors, this study presents the results of an exploratory study. A questionnaire was developed, validated, and distributed to 265 individuals in various managerial positions across all Moroccan automotive companies, with a 93% response rate. This study fills a significant gap in the literature by examining, on a large scale, the adoption and integration of the OpEx approach within Moroccan automotive companies, thus contributing significantly to academics, OpEx practitioners, and performance optimization researchers.

Keywords

Operational Excellence, Moroccan Automotive Industry, Manufacturing Performance, Lean Six Sigma, Critical Success Factors (CSFs).

Introduction

In an increasingly competitive economic environment, performance has become a strategic imperative for businesses. While traditionally associated with productivity and profitability, performance now encompasses broader dimensions such as customer satisfaction, innovation, and social responsibility. As (Issor 2017) points out, performance is measured by a company's ability to achieve its objectives while optimizing the use of its resources. (Berrah 2013) further argues that performance is not merely about efficiency and effectiveness but also about effectiveness, meaning alignment with the company's strategy.

Operational Excellence, closely linked to performance, aims to optimize processes, improve quality, and reduce costs. It is rooted in a continuous improvement approach, where the company constantly strives to surpass itself. Company performance is a dynamic concept that goes beyond simply measuring financial results. It now integrates social and environmental dimensions and is closely linked to Operational Excellence. Similarly, cultural adaptation is essential.

Previous research highlights that simply copying foreign models is insufficient. OpEx must be adapted to the Moroccan socio-cultural context, taking into account the specificities of the local industrial fabric. As (Anvari et al. 2011) and (Liker et al. 2012) point out, simply imitating foreign models is doomed to fail.

This study highlights a lack of research on the implementation of Operational Excellence (OpEx) in the Moroccan automotive sector. While numerous studies exist on a global scale, few focus on the specific context of Morocco. A rigorous methodology was employed: to address the lack of official data, researchers conducted an in-depth study, company by company, to build a representative database. This innovative methodological approach makes a significant contribution to the field of OpEx research in Morocco.

2. Literature Review

Several studies have explored the critical success factors (CSFs) of implementing Operational Excellence in industrial companies. Research conducted by numerous authors, including (Antony et al. 2024; Ubaid et al.2023; Attar 2024; Näslund 2013; Chadran 2014; Citybabu et al. 2022; Fadly Habidin et al. 2013; Hibaullah et al.2014; Rose et al. 2014; Sayyadi 2023), converges on a set of common factors while emphasizing the importance of tailoring approaches to the specific contexts of each country and company. These studies highlight the importance of leadership commitment, employee training, organizational culture, communication, process management, and employee involvement. (Antony et al. 2024), for instance, identified employee involvement, training, and leadership commitment as key factors. (Ubaid, et al. 2023) highlighted the role of leadership involvement, training, and integrating LSS into the business strategy.

Case studies conducted in various countries, including Malaysia (Fadly Habidin et al. 2013; Hibaullah, et al. 2014; Rose et al. 2014), and China (El Safty 2012), have identified specific cultural and contextual factors that influence the success of LSS implementation. For example, (Fadly Habidin, et al. 2013) showed that leadership and customer orientation were Critical Success Factors in the Malaysian automotive industry. Additionally, studies have emphasized the need to customize LSS approaches to align with the specific characteristics of individual organizations. (Näslund 2013) research revealed that while key success factors may be common across organizational change initiatives, they must be adapted to the unique circumstances of each company.

Through their research, (Mohib et al. 2023; Elboq et al. 2020) have shed light on the CSFs for implementing Lean and Six Sigma within Morocco's industrial landscape. (Mohib et al. 2023), focusing on the food industry, identified six key factors: communication, leadership commitment, training, skills development, employee involvement, and cultural transformation. These factors, interconnected and interdependent, emphasize the need for a comprehensive approach to successful Lean implementation. (Elboq et al. 2020), examining the Moroccan automotive sector, identified four key factors: leadership commitment, effective communication, training, and mastery of Lean and Six Sigma tools. They also highlighted the critical role of adequate resources in supporting this transformation. In conclusion, studies converge on a consensus regarding the importance of factors such as leadership commitment, organizational culture, training, communication, and process management for successful Operational Excellence implementation. However, it is crucial to consider the specific characteristics of each organizational and cultural context to tailor approaches and maximize the benefits of this methodology.

3. Empirical Research and Data Collection

The empirical research was conducted in 2024. A survey questionnaire was developed and adapted based on existing research instruments. This questionnaire was then distributed to all 265 identified automotive companies operating in Morocco, as per the statistical study. It's noteworthy that 588 responses were received from the distributed questionnaires, representing a 93% response rate for the Moroccan automotive sector. The number of responses obtained can be considered representative of all national and multinational automotive companies operating in Morocco. The survey provided sufficient data for an initial, comprehensive exploratory analysis of the adoption status of the Operational Excellence (OpEx) philosophy within the Moroccan automotive sector. As mentioned earlier, all Moroccan automotive companies were contacted. A questionnaire was developed and sent via email and LinkedIn to gather the necessary information. The questionnaire's structure was based on the technical and organizational context of Operational Excellence.

It allowed us to assess:

Motivations for adopting Operational Excellence: What drives companies to adopt this approach?

Critical success factors for achieving OpEx in the Moroccan automotive industry: What are the essential conditions and elements for successful OpEx implementation in this specific context?

4. Results and Discussion (12 font)

4.1 The factors that drive organizations to adopt Operational Excellence

The analysis of the motivations behind adopting Operational Excellence in the automotive sector reveals a limited understanding of its fundamental principles. Despite its growing adoption, Figure 1 provides a snapshot of automotive companies' perceptions and motivations regarding Operational Excellence integration. Here's a summary of the key findings:

Despite its widespread adoption, there is a limited understanding of Operational Excellence. Many organizations perceive it solely as a set of tools for enhancing manufacturing processes (44%), overlooking its broader potential as a comprehensive management philosophy aimed at creating value and delighting customers. 16% of respondents view Operational Excellence as a holistic management approach that permeates all areas of the business. 14% associate Operational Excellence with enhancing product design and management. This underscores the emphasis on product quality and innovation. Only 9% emphasize customer orientation as a core component of Operational Excellence. This relatively low percentage suggests that customer satisfaction is not yet a top priority for all companies. Other categories, such as teamwork, continuous improvement, market expansion, and waste reduction, are mentioned by a minority of respondents, indicating a variety of perspectives.

In conclusion, this graph highlights the diverse understanding of Operational Excellence within the automotive sector. While a majority still view it as a technical tool, a significant minority holds a more comprehensive and strategic view. It is notable that customer orientation and long-term vision appear to be less emphasized in the perceptions of the surveyed companies.

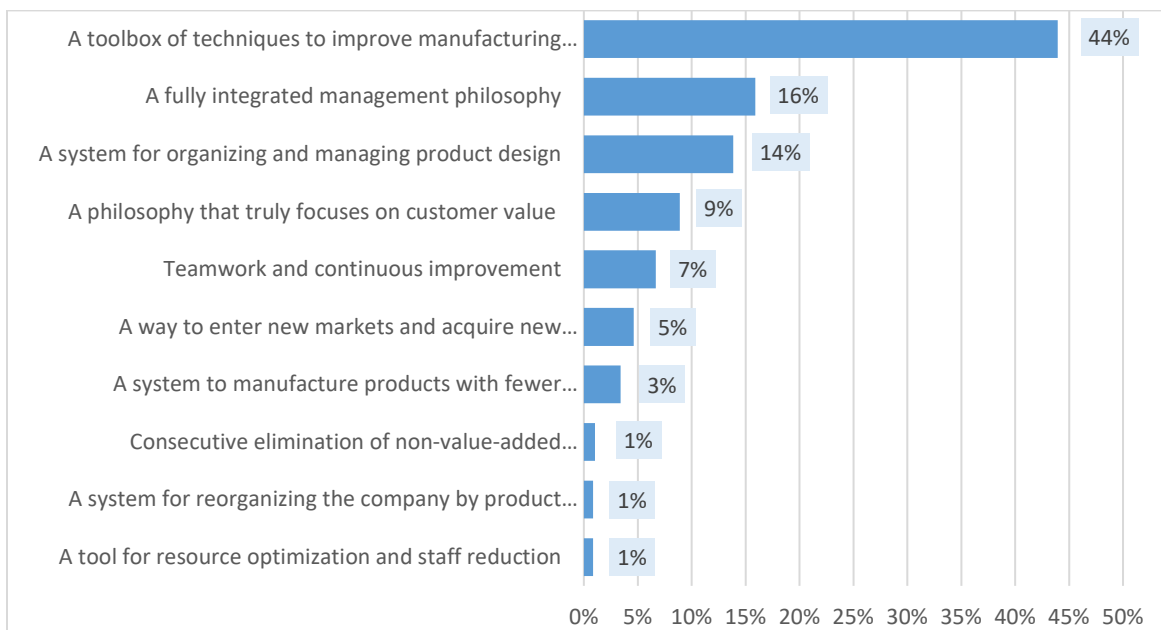


Figure 1. The driving forces behind adopting Operational Excellence

To fully realize the benefits of Operational Excellence, organizations must adopt a comprehensive and strategic approach. This involves shifting from a narrow focus on operational optimization to embracing a holistic view that encompasses the strategic advantages of Operational Excellence. Educating leaders and employees about the underlying principles is key to successful implementation. Aligning Operational Excellence initiatives with long-term business goals, such as market growth and customer satisfaction, is essential for sustainable value creation. Additionally, active engagement from top management is crucial for driving these initiatives and ensuring their integration into the overall business strategy. Finally, fostering a culture of continuous learning and improvement is necessary for developing the skills and capabilities required to excel in all operational aspects.

This analysis reveals a diverse understanding of Operational Excellence within the automotive sector. While a majority view it as a technical tool, a significant minority recognizes its broader strategic implications. However, customer orientation and long-term vision are less prioritized among the motivations for adoption, as confirmed by subsequent research (Hamoumi et al. 2024; Hamoumi et al. 2024).

4.2 Critical success factors for achieving Operational Excellence

The survey, conducted among 588 employees representing 246 automotive companies in Morocco, aimed to identify the key factors for achieving Operational Excellence in this sector (See Figure 2). Results reveal that certain factors play a crucial role in the successful implementation of OpEx in the Moroccan context. Among these, allocating sufficient time and resources to improvement projects emerged as the most critical factor, with a score of 90.07%. This highlights the need to invest adequate resources to support the implementation and maintenance of OpEx practices. The absence of adequate resources can hinder improvement efforts and limit potential gains.



Figure 2. Critical success factors for achieving Operational Excellence

Coming in second was the importance of strong management commitment to quality and continuous improvement, which scored 87.41%. This underscores the critical role of visible leadership and active management support in cultivating a culture of continuous improvement and driving the adoption of OpEx principles. Finally, strong leadership among managers was identified as a crucial element for the success of OpEx in the Moroccan sociocultural context, with a score of 75.60%. This result aligns with previous empirical research on OpEx success factors, which has consistently demonstrated a positive relationship between management attitudes and actions and desired OpEx outcomes. Effective leadership mobilizes employees, manages resistance, and creates an environment conducive to adopting new practices (Liker 2004; Lu, et al. 2011; Brow 2013; Friedli, et al. 2013; Jaeger et al. 2014; Yew et al. 2014; Carvalho et al. 2017; Alkhalidi et al. 2018; Aguilera et al. 2019)

The survey findings, backed by a strong consensus among employees, identify the critical factors for achieving Operational Excellence in the Moroccan automotive sector. By focusing on these fundamental elements, companies can foster a culture of continuous improvement, strong leadership, and employee engagement, leading to superior operational performance, higher product quality, and a sustainable competitive advantage in a dynamic industrial landscape.

6. Conclusion

This study aims to identify the critical success factors (CSFs) for implementing Operational Excellence (OpEx) in the Moroccan automotive industry. Through a survey of 588 employees from 246 companies, the study highlighted several key factors. The allocation of sufficient resources to improvement projects emerged as the most critical factor, followed by strong management commitment and leadership. The study also emphasizes the importance of a culture of continuous improvement, employee training, and the involvement of all levels of the organization. These findings underscore the need for a comprehensive and strategic approach to OpEx in the Moroccan context. Adapting methods and tools to the specific realities of the sector and organizational culture is crucial. Moreover, the study highlights the importance of strong leadership commitment and employee engagement for successful OpEx implementation.

This research contributes to a better understanding of the challenges and opportunities of adopting OpEx in the Moroccan automotive sector, providing guidance for companies seeking to improve their performance.

References

- Z. Issor, «La performance de l'entreprise : un concept complexe aux multiples dimensions,» *Projectics/Proy ctica/Projectique*, n.12, pp. 93-103, 2017.
- L. Berrah, «La quantification de la performance dans les entreprises manufacturi res: de la d claration des objectifs   la d finition des syst mes d'indicateurs,» (Doctoral dissertation, Universit  de Savoie), 2013.
- A. Anvari, Y. Ismail et S. M. H. Hojjati, «Anvari, A., Ismail, Y., & Hojjati, S. M. H. (2011). A study on total quality management and lean manufacturing: through lean thinking approach.,» *World applied sciences journal*, vol. 12, n.19, pp. 1585-1596, 2011.
- J. Liker et G. Convis, Liker, J.K. and Convis, G.L. (2012) *The Toyota Way to Lean Leadership: Achieving and Sustaining Excellence through Leadership Development.*, New York: McGraw-Hill, 2012.
- J. Antony, M. Sony, R. Jayaraman, V. Swarnakar, G. D. L. Tortorella, J. A. Garza-Reyes et B. A. Lameijer, «Global perspectives on operational excellence: unveiling critical failure factors and sustainable pathways» *International Journal of Quality & reliability Management*, 2024.
- A. M. Ubaid et L. A. Al-Juboori, «The critical success factors of the Lean Six Sigma implementation: a systematic literature review» 2023.
- M. T. Attar, «The critical success factors for lean six sigma implementation in small-and-medium-sized enterprises» *South African Journal of Industrial Engineering*, vol. 34, n.14, pp. 59-75, 2024.
- D. N slund, «Lean and six sigma–critical success factors revisited» *International Journal of Quality and Service Sciences*, vol. 5, n.11, pp. 86-100, 2013.
- S. Chadran, «Critical Success Factors for the effective implementation of Lean Six Sigma» 2014.
- G. Citybabu et S. Yamini, «The implementation of Lean Six Sigma framework in the Indian context: a review and suggestions for future research» *The TQM Journal*, vol. 34, n.16, pp. 1823-1859, 2022.
- N. Fadly Habidin et S. R. Mohd Yusof, «Critical success factors of Lean Six Sigma for the Malaysian automotive industry» *International Journal of Lean Six Sigma*, vol. 4, n.11, pp. 60-82, 2013.
- S. N. Hidadullah, N. F. Habidin, F. I. M. Zamri, N. M. Fuzi et A. F. N. C. Desa, «Critical success factors of lean manufacturing practices for the Malaysian automotive manufacturers» *International Journal of Quality and Innovation*, vol. 2, n. 13-4, pp. 256-271, 2014.
- A. N. M. Rose, B. M. Deros et M. A. Rahman, «Critical success factors for implementing lean manufacturing in Malaysian automotive industry» *Research Journal of Applied Sciences, Engineering and Technology*, vol. 8, n.110, p. 1191–1200, 2014.
- M. Sayyadi, «What We Can Learn from the Japanese Organizational Design and Leadership Model» *Muma Business Review.*, 2023.
- S. B. El Safty, «Critical success factors of lean manufacturing implementation in automotive industry in China» *SAE Technical Paper.*, n. 12012-01-0516, 2012.

- A. Mohib, A. En-Nadi et B. Herrou, «Prioritising critical success factors of lean implementation in the food supply chain» In Proceedings on Engineering Sciences, vol. 5, n.11, pp. 119-132, 2023.
- R. Elboq, M. Hlyal et J. El Alami, «Empirical assessment of critical success factor of lean and six sigma in the Moroccan automotive industry» In IOP Conference Series: Materials Science and Engineering, vol. 827, n.11, p. 012043, April 2020.
- M. Hamoumi, A. Haddout et M. Benhadou, «The Integration of Operational Excellence and its Impact Factors in Moroccan Automotive Companies» International Journal of Engineering Trends and Technology, vol. 72, n. 15, pp. 165-177, May 2024.
- M. Hamoumi, M. Benhadou et A. Haddou, «The Maturity of Operational Excellence and its Level of Deployment in Moroccan Automotive Companies» International Journal of Engineering Trends and Technology, vol. 72, n. 112, pp. 387-396, 2024.
- J. K. Liker, «The Toyota way: 14 management principles from the world's greatest manufacturer. In Action Learning Research and Practice» 2004.
- D. Lu, A. Betts et S. Croom, «Re-investigating business excellence: Values, measures and a framework» Total Quality Management & Business Excellence, vol. 22, n. 112, p. 1263–1276, 2011.
- A. Brow, «Managing challenges in sustaining business excellence» International Journal of Quality and Reliability Management, 2013.
- T. Friedli, F. Liebetrau et R. Luetzner, «Managing Global Pharmaceutical Manufacturing Networks. In Leading Pharmaceutical Operational Excellence: Outstanding Practices and Case» Springer Berlin Heidelberg., p. 411–418, 2013.
- A. Jaeger, K. Matyas et W. Sihn, «Development of an Assessment Framework for Operations Excellence (OsE), based on the Paradigm Change in Operational Excellence (OE)» Procedia CIRP, vol. 17, p. 487–492, 2014.
- O. F. Yew et H. Ahmad, «The effect of change management on operational excellence moderated by commitment to change: evidence from Malaysia» International Journal of Innovation and Applied Studies, vol. 9, n.12, p. 615–631, 2014.
- A. M. Carvalho, P. Sampaio, E. Rebenstisch et P. Saraiva, «Operational excellence as a means to achieve an enduring capacity to change—revision and evolution of a conceptual model» Procedia Manufacturing, vol. 13, p. 1328–1335, 2017.
- B. Alkhalidi et A. Abdallah, «Lean bundles and performance outcomes in the pharmaceutical industry: benchmarking a Jordanian company and operational excellence international project» Modern Applied Science, vol. 12, n.18, p. 90–102, 2018.
- J. T. Aguilera et D. A. M. Treviño, «Critical success factors for the implementation of operational excellence» Paper presented at the Proceedings of the International Conference on Industrial Engineering and Operations Management, Thailand., 2019.

Biographies

Mohammed Hamoumi is the founder and president of the HiQuality Management association, enabling him to organize and conduct 68 seminars in faculties and higher education schools in Morocco as a speaker. Furthermore, visiting most automotive equipment manufacturers' factories in Morocco as a trainer or auditor has allowed him to consolidate his knowledge and build a network in the Moroccan automotive industry. He is a graduate of Polytech Lille, the leading public engineering school of the University of Lille in France and holds an MBA from EHPT/ENPC - School of International Management Paris. With 17 years of experience in the automotive sector in Morocco, he has held various management positions at ST Microelectronics, LEONI, and PSA, where he managed the startup of the KENITRA plant as Director of Quality and Engineering. He has had the opportunity to visit major PSA factories worldwide (France: Poissy, Velizy, Mulhouse, Sochaux, Valenciennes; Spain: Vigo, Madrid; Portugal: Mangualde; China: Shaingdu, Wuhan 1, 2, and 3). Having gained extensive and sufficient experience with a desire to continue his studies, Mohammed HAMOUMI started his doctoral project in October 2018 in industrial engineering at the LM2I Laboratory with the Industrial Management Team and Technology of Plastics and Composites at ENSEM Casablanca. Mohammed HAMOUMI is certified in IRCA ISO 9001, ISO 14001, ISO 45001, ISO 50001, IATF 16949 V2016, APSAD standard, NEBOSH, BBLSS, and other certifications.

Dr. Mariam Benhadou is a Professor at Industrial Management and Technology of Plastics and Composites Team, Mechanical Laboratory, Engineering and Innovation, ENSEM, Casablanca, Morocco.

Dr. Abdellah Haddout is a Professor and Director at Industrial Management and Technology of Plastics and Composites Team, Mechanical Laboratory, Engineering and Innovation, ENSEM, Casablanca, Morocco.