



EFFECTIVENESS OF TOTAL QUALITY MANAGEMENT AND PRODUCT QUALITY IMPLEMENTATION IN IMPROVING COMPANY OPERATIONAL PERFORMANCE

Dewi Nuraini^{1*}, Muhammad Rafi Abhipraya², Natasya Dara Susanti³, Ferdi Pakih Hasan⁴

^{1,2,3,4}Faculty of Economics and Business, Universitas Siliwangi, Tasikmalaya, Indonesia

[*223402048@student.unsil.ac.id](mailto:223402048@student.unsil.ac.id)

Abstract. This research aims to assess how effectively Total Quality Management (TQM) and product quality contribute to enhancing a company's operational performance. A quantitative method was employed using a structured questionnaire distributed to respondents involved in production and operational activities. The collected data were processed using multiple linear regression in SPSS, alongside classical assumption tests normality, multicollinearity, and heteroscedasticity to ensure that the model met statistical requirements before hypothesis analysis. The findings reveal that TQM significantly and positively influences operational performance, as indicated by a significance level below 0.05 and a positive partial R^2 showing improvements in productivity and efficiency. Product quality likewise demonstrates a positive and significant effect, confirmed by its regression coefficient and its role in maintaining operational consistency, reducing defects, and supporting stable performance. Together, both variables account for a considerable portion of the variability in operational performance, as reflected in the overall R^2 value, reinforcing the strong link between quality-oriented management practices and operational outcomes. The results emphasize that combining TQM principles customer orientation, continuous improvement, and employee participation with product quality enhancement forms an essential approach to achieving sustainable operational excellence. This study provides practical insights for companies in formulating integrated quality strategies and offers empirical evidence that can guide future research examining other factors influencing operational performance across different industrial contexts.

Keywords: total quality management; product quality; operational performance; quantitative analysis; regression analysis.

1. Introduction

The implementation of Total Quality Management (TQM) has become a crucial requirement for companies seeking to improve their operational effectiveness and efficiency. Through the involvement of all parties within the organization, TQM helps create a work culture oriented towards continuous improvement and quality control throughout every production process. Research shows that consistent TQM implementation can reduce error rates, improve work processes, and increase company productivity (Permana et al., 2021). Furthermore, product quality also plays a crucial role in maintaining optimal operational performance. Products that meet high quality standards—whether in terms of durability, reliability, or conformance to customer needs—will strengthen a company's reputation and reduce costs due to defects or returns (Sri Puspita Sari, 2024). Furthermore, the synergy between TQM implementation and product quality improvement has been shown to positively impact the efficiency, competitiveness, and sustainability of company operations across various industrial sectors. Thus, both serve as essential foundations for building superior operational performance amidst today's intense business competition.

However, most previous research has focused on the implementation of TQM and product quality separately, without comprehensively examining how the two interact to shape sustainable operational performance. Furthermore, research findings vary regarding the extent to which TQM and product quality directly impact company efficiency and productivity. Some studies demonstrate a significant positive effect, while others find that the impact depends on management commitment and the organization's readiness to implement quality principles comprehensively. This inconsistency in research findings indicates a research gap that requires further study, namely how the effectiveness of Total Quality Management and product quality can be synergistically applied to optimally improve company operational performance in various industrial contexts.

Based on the background description, this study begins with the question of how the implementation of Total Quality Management (TQM) can influence improvements in a company's operational performance. Furthermore, this study highlights the extent to which product quality plays a role in supporting the effectiveness and efficiency of operational activities. Furthermore, this study seeks to examine the synergistic relationship between TQM implementation and product quality improvement in building superior operational performance and competitiveness amidst the dynamics of industrial competition.

In line with this research problem formulation, this study aims to analyze the impact of TQM implementation on a company's operational performance, understand the role of product quality in enhancing operational efficiency and effectiveness, and examine the relationship between TQM and product quality as an integrated strategy for achieving sustainable operational excellence. Additionally, this study offers a novelty by combining both soft and hard elements of TQM with direct product quality indicators within the context of the building materials industry, a sector that has received limited attention in previous empirical research.

2. Research Method

This study employed a quantitative approach with a descriptive and explanatory design. The use of a quantitative method was considered appropriate because the research aimed to understand how Total Quality Management (TQM) and product quality contribute to variations in operational performance, both individually and when examined together. The empirical data used in this research were obtained directly from respondents through the distribution of structured questionnaires.

2.1 Data Collection

Data were collected using a structured questionnaire distributed to employees and managerial staff working in production and operational divisions. A purposive sampling technique was applied to ensure that respondents were individuals who were directly involved in quality-related activities or operational decision-making.

A total of 50 respondents participated in this study. This number is considered sufficient for multiple regression analysis, which generally requires a minimum sample size proportional to the number of variables to ensure adequate statistical strength.

The variables were measured through several indicators commonly used in previous research:

TQM: customer focus, continuous improvement, employee involvement

Product Quality: product performance, reliability, innovation

Operational Performance: efficiency, productivity, process consistency

All items were assessed using a Likert-type scale to capture respondents' perceptions in a consistent and structured manner. Validity and Reliability Tests Prior to the main analysis, the questionnaire items were tested to ensure they met the required quality standards. Validity was evaluated by examining the correlation between each item and its total construct score. Items were considered valid when their corrected item-total correlation exceeded 0.30 and the significance level met the acceptable threshold. Reliability was examined using Cronbach's Alpha. Constructs with Alpha values above 0.70 were classified as reliable, indicating that the items consistently measured the intended conceptual dimensions. The results of both tests confirmed that all items used in this study were valid and reliable, allowing them to be used in further statistical analysis.

The collected data were analyzed using multiple linear regression to determine the extent to which TQM and product quality influence operational performance. Before running the regression model, several classical assumption tests were carried out, including checks for normality, multicollinearity, and heteroscedasticity. These tests were conducted to verify that the model met the requirements for generating unbiased and reliable estimates. All analyses were conducted using SPSS, which provided outputs such as regression coefficients, significance levels, and the coefficient of determination (R^2). These outputs were used to interpret the strength of relationships among variables and to identify the relative contribution of each independent variable to operational performance.

2.2 Literature Review

Total Quality Management (TQM) is a comprehensive management approach that integrates all organizational processes to achieve continuous quality improvement and customer satisfaction. This concept emphasizes that quality is not the responsibility of a single department but must be embedded as an organizational culture implemented by all members of the company. According to Wiyono et al. (2023), TQM is built on three main pillars: leadership commitment, employee involvement, and continuous improvement. These components form a crucial foundation for achieving operational excellence focused on efficiency and quality. Similarly, Setiawan and Nursyamsi (2022) explain that effective TQM practices enable companies to reduce production errors, improve process efficiency, and strengthen competitiveness in dynamic market environments.

Product quality also plays a vital role in enhancing a company's operational performance. Kotler and Keller (2021) define product quality as a product's ability to meet customer expectations through attributes such as performance, reliability, durability, and conformity to user needs. Empirical evidence by Suryani and Hidayat (2023) shows that superior product quality contributes directly to better operational outcomes by minimizing waste, optimizing resource utilization, and lowering production costs. Furthermore, Siregar et al. (2022) assert that consistent product quality not only increases productivity but also reinforces market trust in the company's brand, making it a critical determinant of long-term operational success.

Based on previous studies, both TQM and product quality are consistently identified as significant drivers of operational performance. However, research by Aljazirah (2024) and Rahmawati and Santoso (2022) highlights that the interaction between these two variables remains underexplored, particularly in the building materials industry. This gap forms the basis of the present study, which aims to analyze the simultaneous influence of TQM and product quality on operational performance.

Conceptually, this study assumes that TQM and product quality both exert positive and significant effects on operational performance, whether individually or collectively. The integration of continuous improvement, leadership, employee engagement, and strong product quality control is expected to enhance operational efficiency, increase productivity, and strengthen business competitiveness. This conceptual framework is supported by empirical findings from previous research (Wiyono et al., 2023; Setiawan & Nursyamsi, 2022; Suryani & Hidayat, 2023; Athallah & Purnama, 2023), all of which confirm the complementary roles of quality management and product excellence in achieving operational effectiveness. By contextualizing this analysis within the building materials sector, the present study contributes new insights into how these variables interact in production environments characterized by tangible products and high process complexity.

1. Similarities with Previous Research

Previous studies (e.g., Wiyono et al., 2023; Tri Ngudi Wiyatno et al., 2024; Athallah & Purnama, 2023) consistently show that TQM has a significant positive impact on operational performance. These works emphasize core elements such as continuous improvement, leadership, employee involvement, and customer focus as key success factors. This aligns with the present study, which finds that TQM enhances production efficiency, reduces operational costs, and improves productivity in concrete manufacturing processes.

2. Differences from Previous Research

Unlike earlier studies that focused mainly on food or light manufacturing sectors (e.g., tempe cracker industries and SME fish-processing sectors), this study extends the scope to the building materials industry, which faces unique operational challenges involving product durability, physical strength, and dimensional accuracy. While earlier research often positioned product quality as an outcome variable, the present study treats product quality as an independent variable alongside TQM, highlighting its direct influence on operational performance.

Additionally, prior studies (e.g., Acquah et al., 2023; Soesilo, 2024) generally examined soft TQM elements such as leadership and organizational culture. In contrast, this research integrates both soft and hard TQM components, including product control, ISO 9001:2015 compliance, and physical product testing. This combination bridges the research gap by incorporating both strategic (TQM) and technical (product quality) dimensions into a single operational framework.

3. Conclusion

Based on the research findings and supported by theoretical frameworks discussed in the literature, it can be concluded that Total Quality Management (TQM) and product quality both exert significant and positive effects on operational performance. This is consistent with the theoretical perspectives of Wiyono et al. (2023) and Setiawan & Nursyamsi (2022), who emphasize that TQM—through leadership commitment, employee involvement, and continuous improvement—serves as a strategic foundation for achieving operational excellence. The results of this study likewise confirm that customer focus and continuous improvement are the most dominant strengths within the organization, while employee involvement still requires reinforcement to fully align with the principles of comprehensive TQM implementation. Furthermore, product quality is found to significantly influence operational performance, in accordance with Kotler and Keller's (2021) concept of product quality attributes such as performance, reliability, and

durability. The findings of this study also align with Suryani & Hidayat (2023) and Siregar et al. (2022), showing that high product reliability and consistency help reduce defects, stabilize production processes, and minimize operational inefficiencies. However, aspects related to product innovation still provide opportunities for further improvement, especially in industries that rely on technological advancements and process enhancement.

When applied simultaneously, TQM and product quality create a complementary and synergistic impact on operational performance. This supports the view that both soft TQM elements (such as leadership and employee involvement) and hard elements (such as process control and product conformity) must operate together to generate sustainable operational efficiency and strengthen competitiveness. The study reinforces the argument presented in previous literature that integrated quality management practices are essential for maintaining high standards of operational performance. In practical terms, organizations should prioritize strengthening employee participation in TQM processes, ensuring consistent implementation of quality standards, and enhancing product innovation to improve long-term competitiveness. Future research may expand the scope by incorporating additional variables such as competitive strategy, supply chain integration, or technological capability, as well as applying comparative or longitudinal designs to deepen the understanding of factors influencing operational performance across industries.

References

- Acquah, G., Quaicoe, S., & Arhin, K. (2023). Investing in TQM Practices for Enhanced Operational Performance. *Quality Management Journal*.
- Aljazirah, N. H. (2024). The Influence of Total Quality Management, Competitive Advantage, and Leadership on Operational Performance: Case of PT Roda Mas Baja Inti. *International Journal of Business Excellence*, 9(2), 59–70.
- Athallah, R., & Purnama, D. (2023). The Effect of Total Quality Management and Innovation on Operational Performance in Fish Processing SMEs. *Indonesian Journal of Management Studies*, 11(1), 77–88.
- Heizer, J., Render, B., & Munson, C. (2020). *Operations Management* (13th ed.). Pearson Education.
- Kotler, P., & Keller, K. L. (2021). *Marketing Management* (16th ed.). Pearson Education.
- Permana, A., Purba, H. H., & Rizkiyah, N. D. (2021). A systematic literature review of total quality management (TQM) implementation in the organization. *International Journal of Production Management and Engineering*, 9(1), 25–36. <https://doi.org/10.4995/IJPME.2021.13765>
- Rahmawati, A., & Santoso, R. (2022). Total Quality Management Practices and Their Effect on Operational Efficiency in Indonesian SMEs. *Journal of Business and Management Research*, 14(3), 120–132.
- Setiawan, A., & Nursyamsi, A. (2022). The Impact of TQM Implementation on Organizational Performance: Evidence from Indonesian Manufacturing Firms. *Journal of Industrial and Operations Research*, 10(2), 55–68.
- Siregar, D., Lestari, F., & Putri, N. (2022). Product Quality Consistency and Its Impact on Operational Performance in Manufacturing Companies. *Asian Journal of*

Business and Management, 8(3), 101–110.

Sri Puspita Sari. (2024). Analisis Pengaruh Kualitas Manajemen Operasional Terhadap Kinerja Perusahaan. *Jurnal Riset Manajemen Dan Ekonomi (Jrime)*, 3(1), 14–20. <https://doi.org/10.54066/jrime-itb.v3i1.2719>

Suryani, E., & Hidayat, R. (2023). The Role of Product Quality in Improving Operational Efficiency: A Case Study in Local Industries. *Journal of Applied Economics and Business*, 5(4), 89–98.

Wiyono, T., Zulfikarijah, S., & Fuadiputra, H. (2023). Implementation of Total Quality Management (TQM) on Operational Performance in Food Industry SMEs. *Journal of Management and Entrepreneurship*, 8(4), 33–41.