

# **The Dynamics of Quality Management System (QMS) in Maintenance Operations**

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## **Abstract**

Through an extensive review of industry practices, data analysis, and observed evidence, this study seeks to provide an in-depth understanding of how QMS practices shape the maintenance landscape. The research begins by examining the relationship between QMS and safety and reliability, uncovering how well-structured QMS frameworks contribute to maintenance operations and heightened reliability. It further explored the role of QMS in ensuring regulatory compliance, highlighting the mechanisms through which maintenance organizations align with industry regulations and standards. Maintenance emerges as a central theme, as this study scrutinizes the economic implications of QMS implementation. Through historical data analysis, the impact of QMS on reducing operational costs is analyzed, while preserving safety standards. Continuing on the path of continuous improvement, this study evaluates how QMS fosters a culture of excellence, innovation, and adaptability within maintenance organizations. Risk management was also investigated to determine how the QMS facilitates effective risk assessment and mitigation strategies, thereby

enhancing safety. This research concludes by examining the dynamics of supply chain integration, dissecting how QMS practices streamline and optimize supply chains in maintenance setting. The research adopts a qualitative approach to explore and explain QMS dynamics in maintenance operations.

### **Keywords**

QMS, Safety, Industry, Risk and Maintenance.

### **Biographies**

**Ngaka Mosia** is a lecturer at the University of South Africa. He holds a Master of philosophy in Engineering Management degree from the University of Johannesburg. Ngaka has presented various national and international conference papers and published several journal papers. He is a member of SAIIE, IEOM, NADEOSA and SASEE and has more than 20 years' industry experience on various levels.

Kemlall Ramdass is a full Professor and associate director of quality in the School of Engineering in the college of science, engineering and technology. He is the first full professor in the department Industrial Engineering in the University of South Africa. He earned a master's in engineering management from the University of Johannesburg and PhD in Engineering Management from University of Johannesburg. He has published journal and conference papers. His research interests include manufacturing, simulation, optimization, reliability, scheduling, manufacturing, and lean. He is a member of IEOM, SAIIE, ECSA and SASEE.

**Koketso Masenya** is a lecturer in the department of industrial engineering, in the college of science engineering and technology, at the University of South Africa. She has taught courses in production management and entrepreneurship and innovation for engineers. Ms. Koketso Masenya is an emerging researcher and member of woman in engineering. She is a member of IEOM and SAIIE.