African Maintenance Engineering

Evaluating Process-Control Systems in Tanzanian Maintenance Environments: A Quasi-Experimental Study on Efficiency Gains

Kilimo Mbulu[1]

[1] University of Dar es Salaam

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Correspondence: kmbulu@hotmail.com

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Author notes

Kilimo Mbulu is affiliated with University of Dar es Salaam and focuses on Engineering research in Africa.

Abstract

This study evaluates the effectiveness of process-control systems in Tanzanian maintenance environments. A quasi-experimental design was employed, including pre- and post-assessments with control and experimental groups. Process-control system performance metrics were collected over six months. Initial results indicate an average efficiency gain of 15% in the intervention group compared to a 10% increase in the control group, suggesting significant improvements in maintenance processes. The findings support the efficacy of process-control systems in enhancing operational efficiency within Tanzanian maintenance settings. Further research should focus on scalability and long-term impact, while practical implementation guidelines are recommended for adoption in similar environments. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Tanzania, Maintenance Engineering, Control Systems, Methodology, Process Improvement, Quasi-Experimental Design, Evaluation Theory*

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