



# Methodological Evaluation of Process-Control Systems in Kenyan Industries: A Quasi-Experimental Study on Cost-Effectiveness

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## Abstract

The adoption of process-control systems in Kenyan industries has been inconsistent due to a lack of standardised evaluation methodologies. A mixed-method approach was employed, including surveys, interviews, and statistical analysis to assess system performance and economic outcomes across selected industries. The analyses revealed that a specific process control system reduced operational costs by 15% (95% CI: -10%, -23%) compared to traditional methods in manufacturing sectors. This study provides empirical evidence supporting the cost benefits of implementing advanced process-control systems, offering insights for policy and industry stakeholders. Industry practitioners are encouraged to adopt these control systems based on this study's findings, while policymakers should consider incentives or guidelines for their implementation. process-control systems, cost-effectiveness, engineering applications, quasi-experimental design, Kenyan industries The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u_i + \epsilon_i$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** Kenyan industries, Process-control systems, Methodology, Evaluation studies, Quasi-experimental design, Cost-effectiveness analysis, Industrial engineering

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