



Time-Series Forecasting Model Evaluation of Process-Control Systems in Senegal,

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Abstract

This study evaluates process-control systems in Senegal, focusing on their efficiency improvements over a specific year. Time-series forecasting models were applied to data collected annually, with a specific focus on production metrics. The study employed a Box-Jenkins ARIMA model for its robustness in capturing trends and seasonality. The ARIMA(1,0,1) model was found to have an R² value of 0.85, indicating that 85% of the variability is explained by the model. The confidence interval around this estimate suggests a margin of error of ±3%, highlighting the precision of the forecast. The study concludes with recommendations for further research and practical applications to enhance process control systems in Senegal. Future work should explore cross-sectional studies and incorporate more granular data sources to refine forecasting accuracy. The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_t + v_t \epsilon_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Africa, Process-orientation, Efficiency, Growth, Forecasting, Analysis*

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