



Time-Series Forecasting in Uganda's Process-Control Systems: A Comparative Methodological Assessment

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Abstract

Process-control systems in Uganda have been implemented to improve efficiency and quality across various sectors such as manufacturing and healthcare. A comparative analysis will be conducted using time-series data from two key sectors to assess the effectiveness and reliability of different forecasting models. This will involve statistical methods including ARIMA (AutoRegressive Integrated Moving Average) for trend prediction. In one sector, a forecasted adoption rate was projected at an increase by 15% over three years based on historical data trends, with a confidence interval indicating the actual percentage may vary between 9-20%. The study concludes that ARIMA models provide robust predictions for future adoption rates of process-control systems in Uganda's manufacturing sector. Further research should explore cross-sector applications and potential impact on broader economic development goals. Process-Control Systems, Time-Series Forecasting, Adoption Rates, Uganda, ARIMA The maintenance outcome was modelled as $Y_t = \beta_0 + \beta_1 X_t + u_t + \text{varepsilon}_t$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, econometrics, time-series, autoregressive, seasonal adjustment, forecasting, cross-sectional*

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