African Food Processing Technology (Food Science/Technology)

Time-Series Forecasting Model Evaluation for Transport Maintenance Depot Systems in Ghana

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Abstract

This study evaluates the efficiency of transport maintenance depots in Ghana by applying a time-series forecasting model to forecast future maintenance needs and resource allocation. A time-series analysis was conducted using an ARIMA model (e.g., $ARIMA(p,d,q)$) to forecast maintenance requirements. Model robustness was assessed through standard error calculations, ensuring reliable predictions within a 95% confidence interval. Maintenance needs showed a clear seasonal pattern with peaks in the third quarter each year, indicating that future forecasts should account for these recurring demands. The ARIMA model provided accurate predictions of maintenance requirements, enabling depot managers to better allocate resources and reduce inefficiencies. Depot managers are advised to implement preventive maintenance strategies based on forecasted needs, thereby enhancing overall system efficiency.

Keywords: *Geographic, Time-series, Forecasting, Maintenance, Econometrics, Regression, Spatial Analysis*

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