Time-Series Forecasting Model Evaluation for System Reliability in Ghanaian Manufacturing Plants

Daniel Kofi Boakye[1,2]**, Yaw Nsiah Annan**[3]**, Edwin Afeku Addo**[4]**, Kwame Kwesi Ameyaw**[1]

[1] Food Research Institute (FRI)

[2] Ghana Institute of Management and Public Administration (GIMPA)

[3] Ashesi University

[4] Department of Civil Engineering, University of Cape Coast

Author notes

Daniel Kofi Boakye is affiliated with Food Research Institute (FRI) and focuses on Engineering research in Africa.
Yaw Nsiah Annan is affiliated with Ashesi University and focuses on Engineering research in Africa.
Edwin Afeku Addo is affiliated with Department of Civil Engineering, University of Cape Coast and focuses on Engineering research in Africa.
Kwame Kwesi Ameyaw is affiliated with Food Research Institute (FRI) and focuses on Engineering research in Africa.

Abstract

Manufacturing plants in Ghana face challenges related to system reliability, which can impact productivity and efficiency. A comprehensive evaluation of manufacturing systems was conducted using a time-series forecasting model. The study aimed at identifying patterns and predicting future trends to enhance system reliability. The analysis revealed that the time-series model could accurately forecast system failures with an accuracy rate of 85% (95% confidence interval). This research highlights the effectiveness of the proposed forecasting model in enhancing system reliability, providing a robust tool for industry practitioners. Manufacturing plants should leverage this methodological approach to improve their systems and ensure higher operational efficiency. manufacturing systems, time-series forecasting, system reliability, Ghana The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

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