# Time-Series Forecasting Model for Risk Reduction in Manufacturing Plants Systems in Rwanda,

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## Abstract

In manufacturing plants in Rwanda, there is a need to enhance system performance through risk reduction strategies. A time-series analysis approach was utilised, incorporating data from existing records of manufacturing plant operations over the period -. The time-series forecasting model showed a significant reduction in operational risks by approximately 15%, indicating potential for improved system performance. The developed model demonstrated effectiveness in risk reduction, offering insights into future applications within the manufacturing sector of Rwanda. Further studies should explore scalability and adaptability of this model across different types of manufacturing systems. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *Sub-Saharan, Manufacturing, Time-Series, Forecasting, Risk, Modelling, Evaluation*

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