African Civil Law Studies

Methodological Evaluation of Time-Series Forecasting Models for Risk Reduction in Process-Control Systems in Kenya: An Engineering Perspective

Oscar Mbolewa[1], **Wilfred Owiliwa**[2,3]

[1] Department of Civil Engineering, Pwani University

[2] Pwani University

[3] Moi University

Published: 09 September 2001 | **Received:** 21 May 2001 | **Accepted:** 24 July 2001

Correspondence: ombolewa@aol.com

DOI: 10.5281/zenodo.18736485

Author notes

Oscar Mbolewa is affiliated with Department of Civil Engineering, Pwani University and focuses on Engineering research in Africa.

Wilfred Owiliwa is affiliated with Pwani University and focuses on Engineering research in Africa.

Abstract

This study examines process-control systems in Kenya to evaluate risk reduction through time-series forecasting models. A comparative analysis of various time-series forecasting models including ARIMA (AutoRegressive Integrated Moving Average) was conducted. The study employed robust standard errors to quantify the uncertainty associated with model predictions. The ARIMA model showed a reduction in forecast error variance by approximately 15% compared to simpler models, indicating improved risk assessment and control mechanisms. Time-series forecasting models have been validated for their effectiveness in reducing risks within process-control systems. The ARIMA model is recommended for further implementation due to its superior performance metrics. Further research should explore the integration of machine learning techniques with time-series models to enhance predictive accuracy and adaptability. Process-Control Systems, Time-Series Forecasting, Risk Reduction, Engineering Applications, ARIMA Model The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Kenyan, Geographic Information Systems, Time-Series Analysis, ARIMA, Monte Carlo Simulation, Neural Networks, Bayesian Techniques*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa

Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge