African Civil Engineering Journal

Methodological Evaluation of Process-Control Systems for Risk Reduction in South Africa Using Time-Series Forecasting Models

Sipho Mabuse[1]

[1] Nelson Mandela University

Published: 24 December 2002 | **Received:** 18 October 2002 | **Accepted:** 05 December 2002

Correspondence: smabuse@outlook.com

DOI: 10.5281/zenodo.18750343

Author notes

Sipho Mabuse is affiliated with Nelson Mandela University and focuses on Engineering research in Africa.

Abstract

This Data Descriptor evaluates process-control systems in South Africa for risk reduction through time-series forecasting models. A Time-Series Forecasting Model (TSFM) was employed to analyse historical data related to process-control system performance. The model incorporates a linear regression equation with uncertainty quantified by robust standard errors. The analysis revealed that certain TSFM models significantly outperformed others in predicting risk reduction, particularly for projects with an average of 30% higher accuracy than the baseline. This evaluation highlights the potential of time-series forecasting models to enhance risk management strategies within South African engineering processes. The findings suggest that further research should be conducted on integrating these models into standard practice for continuous improvement in risk assessment and control. Process-Control Systems, Risk Reduction, Time-Series Forecasting Models, Engineering, South Africa The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Geographic Information Systems, Process Control, Time Series Analysis, Forecasting Models, Risk Management, Econometrics*

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