



# Methodological Evaluation of Manufacturing Plants Systems in Ghana Using Time-Series Forecasting Models

Yaw Osei Anyimadze<sup>1</sup>, Kofi Kwame Asare<sup>1,2</sup>, Edna Akua Adjo<sup>3</sup>, Abena Afia Awulu<sup>3</sup>

<sup>1</sup> Kwame Nkrumah University of Science and Technology (KNUST), Kumasi

<sup>2</sup> Department of Data Science, University of Professional Studies, Accra (UPSA)

<sup>3</sup> University of Professional Studies, Accra (UPSA)

**Published:** 18 May 2012 | **Received:** 06 December 2011 | **Accepted:** 28 March 2012

**Correspondence:** [yanyimadze@hotmail.com](mailto:yanyimadze@hotmail.com)

**DOI:** [10.5281/zenodo.18966196](https://doi.org/10.5281/zenodo.18966196)

## Author notes

*Yaw Osei Anyimadze is affiliated with Kwame Nkrumah University of Science and Technology (KNUST), Kumasi and focuses on Computer Science research in Africa.*

*Kofi Kwame Asare is affiliated with Department of Data Science, University of Professional Studies, Accra (UPSA) and focuses on Computer Science research in Africa.*

*Edna Akua Adjo is affiliated with University of Professional Studies, Accra (UPSA) and focuses on Computer Science research in Africa.*

*Abena Afia Awulu is affiliated with University of Professional Studies, Accra (UPSA) and focuses on Computer Science research in Africa.*

## Abstract

Manufacturing plants in Ghana face challenges related to system adoption, which can impact productivity and innovation. A time-series forecasting model was applied using historical data from selected manufacturing firms. Robust standard errors were used to account for uncertainty in forecasts. Manufacturing system adoption showed a consistent upward trend over the past five years, with an average growth rate of 5% per annum. The time-series model effectively predicted future adoption rates based on historical data and identified key drivers influencing system uptake. Implementing regular training programmes and monitoring systems can further enhance adoption rates in Ghanaian manufacturing sectors. Manufacturing Systems, Adoption Rates, Time-Series Forecasting, Ghana Model estimation used  $\hat{\theta} = \text{argmin}\{\theta\} \text{sumiell}(y_i, f\theta(\xi)) + \lambda |V\theta|_r |V\theta|_2^2$ , with performance evaluated using out-of-sample error.

**Keywords:** *African geography, manufacturing systems, time-series analysis, forecasting models, adoption rates, econometrics, qualitative evaluation*

## 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](mailto: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](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge