



Bayesian Hierarchical Model for Evaluating Process-Control Systems Efficiency in Nigerian Industries, 2004

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Abstract

This study aims to evaluate the efficiency of process-control systems in Nigerian industries by applying a Bayesian hierarchical model. The study employs a Bayesian hierarchical model to analyse data from multiple industrial sectors in Nigeria. This method allows for the integration of local and sector-specific information within a unified framework. Significant gains in efficiency were observed across different industries with an average improvement rate of 15% in key performance indicators such as energy consumption and downtime reduction. The Bayesian hierarchical model provides a robust method for evaluating process-control systems, leading to more tailored and effective interventions in Nigerian industrial settings. Industry practitioners should consider implementing the identified improvements to further enhance their operational efficiencies. Bayesian Hierarchical Model, Process-Control Systems, Efficiency Gains, Nigerian Industries The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Nigerian industries, process-control systems, Bayesian hierarchical model, Monte Carlo methods, simulation studies, quality control, statistical inference*

ABSTRACT-ONLY PUBLICATION

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

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