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(Interdisciplinary -

Methodological Evaluation of Manufacturing Plant Systems in Ethiopia: A Randomized Field Trial on System Reliability

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Abstract

Manufacturing plants play a crucial role in Ethiopia's economic development. However, their reliability and efficiency are often compromised by various factors. A randomized field trial was conducted among selected manufacturing plants using statistical process control (SPC) methods. Data were collected on production output and operational efficiency over six months. System reliability varied significantly across different sectors, with electronic goods manufacturing showing the highest system stability at a mean reliability rate of 95%. The randomized field trial provided valuable insights into improving the reliability of manufacturing systems in Ethiopia. Further research should focus on implementing continuous improvement strategies to enhance overall system performance and reduce downtime. Manufacturing plants, System reliability, Randomized field trial, Statistical process control (SPC) Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, African, Spray, Networking, Randomization, Reliability, Ethiopia*

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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