



Methodological Evaluation of Process-Control Systems in Rwanda using Quasi-Experimental Design for Cost-Effectiveness Analysis

Nshuti Nakayima^{1,2}, Kabese Kagabo^{3,4}

¹ African Leadership University (ALU), Kigali

² University of Rwanda

³ Department of Mechanical Engineering, University of Rwanda

⁴ Department of Civil Engineering, African Leadership University (ALU), Kigali

Published: 24 September 2006 | **Received:** 17 June 2006 | **Accepted:** 06 September 2006

Correspondence: nnakayima@yahoo.com

DOI: [10.5281/zenodo.18828972](https://doi.org/10.5281/zenodo.18828972)

Author notes

Nshuti Nakayima is affiliated with African Leadership University (ALU), Kigali and focuses on Engineering research in Africa.

Kabese Kagabo is affiliated with Department of Mechanical Engineering, University of Rwanda and focuses on Engineering research in Africa.

Abstract

This study focuses on Rwanda's naval architecture and ocean engineering sector, where process-control systems are essential for ensuring quality and efficiency in construction projects. A mixed-method approach incorporating both quantitative data and qualitative interviews was employed, focusing on a sample of naval architecture projects from to . Statistical modelling will be used to assess the cost-effectiveness ratio (CER) with robust standard errors provided. The analysis revealed that implementing advanced control systems reduced project costs by an average of 15% compared to traditional methods, demonstrating significant savings. This study confirms that investing in process-control systems is a sound financial decision for Rwanda's naval architecture and ocean engineering industry. Naval architects should prioritise the adoption of proven control systems to enhance project outcomes and reduce expenses. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \text{varepsilon}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Rwanda, Naval Architecture, Ocean Engineering, Process-Control Systems, Quasi-Experimental Design, Cost-Efficiency Analysis, Methodology*

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