

CASE STUDY

# A Quasi-Experimental Evaluation of Process-Control System Adoption in Nigerian Industrial Operations

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## ABSTRACT

**Background:** The adoption of advanced process-control systems in industrial operations within developing economies is often advocated but poorly quantified. In Nigeria, significant investment in such technologies has occurred, yet rigorous methodological evaluations of their uptake and operational integration are scarce, hindering evidence-based policy and practice.

**Purpose and objectives:** This case study aims to methodologically evaluate the rate and determinants of process-control system adoption within selected industrial operations. Its primary objective is to demonstrate the application of a quasi-experimental design to isolate and measure the causal effect of targeted intervention programmes on technology adoption.

**Keywords:** *Quasi-experimental design, Process-control systems, Industrial operations, Sub-Saharan Africa, Technology adoption, Developing economies, Nigeria*

### Article Highlights

- A quasi-experimental design isolates the causal effect of intervention on technology adoption.
- Structured intervention accelerated adoption rates by 34 percentage points.
- Technical workforce capacity overshadowed capital cost as the key integration factor.
- Findings advocate for coupling technology promotion with dedicated training programmes.

### Methodological Note

Employed a difference-in-differences model with plant and time fixed effects to strengthen causal inference beyond descriptive case analysis.

*This study provides a robust framework for evaluating engineering technology adoption in industrial settings.*

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