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The Effect of Customer Integration on the Operational Efficiency of Commercial State Corporations in Kenya

Reuben Musyoka Mwove[1]*

[1]*School of Business and Economics, Department of Commerce, Daystar University*
* Corresponding Author

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Abstract

Commercial State Corporations (CSCs) in Kenya continue to face persistent operational inefficiencies despite ongoing reforms, privatization efforts, and substantial government bailouts. These inefficiencies evident in high operating costs, delays, and inconsistent service quality have been linked to weak supply chain practices, particularly inadequate customer integration. Effective customer integration enables organizations to capture and utilize customer information for demand planning, service customization, and timely operational adjustments, yet its influence within Kenya's state-owned enterprises remains underexplored. This study examined the effect of customer integration on the operational efficiency of commercial state corporations in Kenya. Anchored on Systems Theory and Contingency Theory, the study adopted a descriptive cross-sectional research design and targeted 46 active CSCs, with procurement officers serving as units of analysis. A census approach was used, and data were collected through a structured questionnaire. Ordinary Least Squares regression analysis using SPSS version 30 established that customer integration has a significant positive effect on operational efficiency (t-statistic = 6.909, P-value < 0.05). The findings indicate that CSCs that maintain structured customer feedback systems, engage customers in planning, and align service delivery with customer needs achieve higher levels of efficiency. The study concludes that enhancing customer integration is essential for improving responsiveness, reducing service delays, and strengthening overall operational performance in CSCs. It recommends investment in customer relationship management systems, real-time feedback mechanisms, and structured customer engagement processes to support evidence-based operational decisions and improve efficiency outcomes.

Keywords: Customer Integration, Operational Efficiency, Commercial State Corporations, Process cycle time, Service delivery, Kenya

1. Introduction

Operational efficiency remains a critical determinant of performance among Commercial State Corporations (CSCs) in Kenya, yet many continue to experience high operating costs, service delays, and inconsistent service quality despite reforms and government support (Christopher, 2016). Customer integration defined as the alignment and coordination of organizational processes with customer needs and information has emerged as a central factor influencing efficiency outcomes. Customer integration facilitates the exchange of accurate, timely, and relevant customer information that enhances demand visibility, collaborative planning, production scheduling, and service customization (Prajogo & Olhager, 2012; Wilson et al., 2020). When effectively implemented, it enables organizations to align operations with market needs, reduce forecasting errors, minimize inventory holding costs, and improve responsiveness (Jayaram & Tan, 2010; Daugherty et al., 2011).

Customer integration supports firms in identifying market opportunities and tailoring products or services to meet specific preferences, contributing to reduced lead times, better decision-making, and improved service delivery (Lai et al., 2010; Huo, 2012). Indicators such as real-time feedback systems, customer data analytics, and customization practices enhance planning processes and strengthen the link between supply operations and customer demand (Ganbold, 2017; Cheng et al., 2011). Empirical studies show positive outcomes associated with customer integration, including a 19% reduction in forecasting errors (Daugherty et al., 2011) and 15% shorter lead times (Jayaram & Tan, 2010), demonstrating its potential to significantly enhance operational efficiency.

However, the relationship between customer integration and operational efficiency is not entirely consistent. Some studies highlight challenges such as increased production complexity, operational strain from excessive customization, and misaligned incentives among internal departments (Bendoly et al., 2014; Flynn et al., 2016). These adverse effects suggest that the efficiency gains from customer integration may be context-dependent and influenced by organizational capabilities and market conditions. Moreover, while customer integration is widely acknowledged as essential for improving supply chain performance, evidence regarding its effectiveness within public enterprises especially CSCs operating in volatile and resource-constrained environments remains limited. This creates a critical research gap that necessitates further empirical investigation into how customer integration influences the operational efficiency of Kenya's commercial state corporations.

1.2 Statement of the Problem

Commercial State Corporations in Kenya continue to face major operational inefficiencies despite government support, as shown by persistent financial losses, service delays, and high operational costs. A key contributor to these inefficiencies is weak customer integration, where CSCs lack effective systems for collecting and utilizing customer information to guide demand forecasting, service design, and operational adjustments. This poor linkage results in slow responsiveness, misaligned services, and inefficient resource use. The situation is worsened by high environmental uncertainty, including unpredictable demand shifts and technological changes, which further hinder CSCs' ability to respond to customer needs. Although customer integration is widely recognized as essential for improving operational efficiency, limited empirical evidence exists for Kenya's commercial state corporations. Therefore, the study investigates how customer integration affects their operational efficiency under conditions of environmental uncertainty.

1.3 Objective of the Study

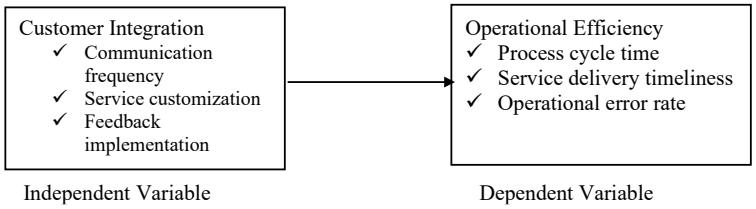
The purpose of the study was to establish the effect of customer integration on the operational efficiency of Commercial State corporations in Kenya.

1.4 Research Hypothesis

There is no statistically significant relationship between customer integration and operational efficiency in Commercial State Corporations in Kenya.

1.5 Conceptual Framework

A conceptual framework illustrates the logical relationships among study variables and guides the entire research process. It clarifies how concepts connect, shapes research questions, and informs methodological decisions (Creswell & Creswell, 2017). Tamene (2016) describes it as a network of interrelated assumptions and expectations that supports the study, while Kothari and Garg (2014) emphasize its role in highlighting and testing proposed relationships. It also provides a structure for interpreting findings and aligning them with the study objectives (Merriam & Grenier, 2019). In this study, operational efficiency of commercial state corporations in Kenya is the dependent variable. The independent variable; customer integration is examined through communication frequency, service customization, and feedback implementation. The framework illustrates how these elements interact to influence operational efficiency.



Source: Researcher (2025)

Figure 1: Conceptual Framework

2. Literature Review

2.1 Theoretical Literature Review: Contingency Theory

Contingency Theory, introduced by Fiedler and later advanced by Lawrence and Lorsch (1967), argues that organizational effectiveness depends on aligning internal processes with situational factors rather than applying a universal management

approach (Donaldson, 2001). In supply chain settings, this means that integration practices vary in effectiveness depending on environmental conditions such as market dynamics, technology, and organizational structure (Wong et al., 2011). The theory is grounded in the assumptions that organizations operate in dynamic environments requiring adaptable structures (Burns & Stalker, 1961), that different contexts demand different designs (Galbraith, 1973), and that organizational success results from achieving a fit between processes and external demands (Drazin & Van de Ven, 1985).

For this study, Contingency Theory underpins customer integration by emphasizing that practices such as communication frequency, service customization, and feedback implementation will not yield uniform outcomes across commercial state corporations in Kenya. Their effectiveness depends on contextual factors such as customer needs, service complexity, and technological capability (Flynn et al., 2010; Ketchen & Giunipero, 2004). Although useful, the theory is limited by its lack of specific guidelines for determining the best fit (Schoonhoven, 1981) and its assumption that managers can accurately interpret environmental conditions despite practical constraints (Mintzberg, 1994).

From the researcher's perspective, the theory supports viewing customer integration as a context-driven process. It explains why practices that enhance performance in one corporation may not do so in another and justifies the study's emphasis on tailoring customer integration strategies to organizational realities to improve operational efficiency.

2.2 Empirical Literature Review

Customer integration has been shown to enhance organizational performance by promoting coordination, information sharing, and responsiveness to client needs (Xinyu, 2021). Studies in private-sector contexts, such as third-party logistics firms in China, demonstrate that integrating customer information improves performance through better demand visibility, differentiation, and cost efficiency, often strengthened by information technologies. Similarly, Devaraj et al. (2017) found that customer integration improves demand forecasting and customer satisfaction in U.S. retail and manufacturing firms. However, these studies focus primarily on private-sector or foreign contexts and emphasize market-oriented outcomes rather than operational efficiency metrics like cost reduction, service timeliness, or process cycle times.

Research in emerging economies, such as Aggrey et al. (2022) in Ghana, indicates that supply chain integration can enhance operational performance, but these studies rarely isolate customer integration as a key factor. Likewise, Tarmizi et al. (2023) showed that digital customer engagement improves operational efficiency, yet the specific role of customer integration in public sector institutions remains underexplored. Consequently, there is a critical knowledge gap regarding how customer integration affects operational efficiency in public-sector supply chains operating under high environmental uncertainty, bureaucratic constraints, and public accountability requirements. The current study addresses this gap by examining how customer integration facilitates demand-driven resource allocation, improves service accuracy, and accelerates response times through real-time feedback, ultimately enhancing operational efficiency in Kenya's commercial state corporations.

3 Research Methodology

3.1 Research Design

This study adopted a descriptive cross-sectional research design to examine the effect of supply chain integration on operational efficiency within Kenya's commercial state corporations. The design was considered appropriate because it allowed the collection of data at a single point in time to describe relationships between variables and assess patterns across the population. The target population consisted of 46 authorized and active commercial state corporations in Kenya. Given the relatively small population size, a census approach was used, covering all corporations to ensure comprehensive and unbiased data collection. The units of analysis were the procurement officers from each corporation, as they are directly involved in implementing supply chain practices and managing operational processes.

Data were collected using a structured questionnaire, which was designed to capture information on supply chain integration dimensions (internal, supplier, and customer integration) and operational efficiency measures, including cost reduction, service timeliness, and process efficiency. To ensure reliability and validity, a pilot test was conducted in six financial state corporations in Nairobi County before the main data collection. Ethical considerations were observed by obtaining informed consent, maintaining confidentiality, and securing necessary approvals from relevant institutions.

For data analysis, the study employed the Ordinary Least Squares (OLS) regression model using SPSS version 30. The analysis aimed to determine the relationship between supply chain integration practices and operational efficiency, both individually and jointly, while also assessing the moderating effect of environmental uncertainty. The results provided insights into the significance and strength of the relationships between the variables, informing recommendations for enhancing supply chain practices and operational performance in Kenya's public sector.

3.2 Data Processing and Analysis

Data analysis involves applying reasoning to understand the collected information, identify patterns, and summarize relevant findings (Bryman, 2016). For this study, primary data on customer integration and operational efficiency were collected using structured questionnaires, entered into Microsoft Excel for cleaning, coding, and organization, and analyzed using SPSS version 30. The analysis focused on the effect of customer integration on operational efficiency in commercial state corporations in Kenya. Customer integration, measured through communication frequency, service

customization, and feedback implementation, served as the independent variable, while operational efficiency was the dependent variable. Descriptive statistics including mean, minimum, maximum, and standard deviationwere computed to summarize the data. Inferential statistics, specifically simple linear regression, were employed to determine the relationship between customer integration and operational efficiency. Hypothesis testing was conducted at a 5% significance level, with the p-value from the t-test used to accept or reject the null hypothesis.

The regression model for the effect of customer integration on operational efficiency is expressed as:

$$Y = \beta_0 + \beta_1 X_3 + \varepsilon$$

Where:

Y= Operational efficiency
β_0= Constant term, representing the expected value of $Y$when customer integration is zero
β_1= Regression coefficient for customer integration, representing the change in operational efficiency for a unit change in customer integration
X_3= Customer integration
ε= Error term

Prior to regression, the data were tested to ensure Ordinary Least Squares (OLS) assumptions of linearity, normality, homoscedasticity, and absence of multicollinearity were met. The analysis aimed to establish whether higher levels of customer integration through improved communication, tailored services, and feedback mechanisms significantly enhance operational efficiency in Kenya's commercial state corporations.

4 Research Findings

4.1 Response Rate

A total of 46 questionnaires were administered to procurement officers in commercial state corporations, out of which 37 were returned and deemed valid for analysis, yielding a response rate of 80.43%. Nine questionnaires were not returned, accounting for 19.57% of the sample. The response rate is considered adequate for statistical analysis and generalization of results (Bryman, 2016).

Table 1: Response Rate

No. of Questionnaires	Frequency	Percentage
Returned	37	80.43%
Not returned	9	19.57%
Total	46	100%

Source: Primary Data (2025)

4.2 Descriptive Statistics on Customer Integration

Customer integration refers to customer engagement and collaboration to meet customer needs and improve service delivery. Respondents were asked to indicate the extent to which their organizations practiced various aspects of customer integration, using a five-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree).

Table 2: Descriptive Statistics on Customer Integration

Customer Integration Item	N	Min	Max	Mean	Std. Deviation
The firm communicates frequently with its customers about their needs.	37	3	5	4.54	0.558
Customers are updated promptly on order status and delivery schedules.	37	3	5	4.35	0.676
The firm holds regular meetings or calls with key customers.	37	3	5	4.32	0.530
Frequent communication with customers improves service delivery.	37	4	5	4.70	0.463
The firm tailors its services to meet different customer requirements.	37	4	5	4.51	0.507
Customers can choose from the multiple service options we provide.	37	1	5	4.08	1.299
The firm is flexible in adapting to specific customer needs.	37	3	5	4.54	0.730
Customer preferences are incorporated into our service offerings.	37	4	5	4.59	0.498
The firm actively seeks feedback from customers on our service performance.	37	3	5	4.35	0.588
Customer feedback is used to improve our operational processes.	37	3	5	4.49	0.607
Feedback mechanisms (e.g., surveys, suggestion boxes) are well established.	37	3	5	4.08	0.829
The firm acts quickly on customer complaints and suggestions.	37	3	5	4.54	0.558
Aggregate				4.42	0.654

Source: Primary Data (2025)

The aggregate mean of 4.42 indicates that procurement officers generally agreed that customer integration practices were

actively implemented within their organizations, particularly regarding frequent communication, service customization, and responsiveness to customer feedback.

4.3 Correlation Analysis

Pearson correlation analysis was used to determine the strength and direction of the relationship between customer integration and operational efficiency.

Table 3: Pearson Correlation between Customer Integration and Operational Efficiency

Variable	Operational Efficiency
Customer Integration	0.760**
	(p = 0.001)

Source: Primary Data (2025)

Notes: Correlation is significant at the 0.01 level (2-tailed).

N = 37

The results indicate a strong positive correlation between customer integration and operational efficiency ($r = 0.760$, $p < 0.05$). This suggests that higher levels of customer integration practices such as feedback mechanisms, service customization, and timely communication are associated with improved operational efficiency within commercial state corporations.

4.4 Regression Analysis

Regression analysis was performed to test the hypothesis: There is no statistically significant relationship between customer integration and operational efficiency in commercial state corporations in Kenya.

The simple linear regression model used was:

$$\text{Operational Efficiency} = \beta_0 + \beta_1 \text{Customer Integration} + \epsilon$$

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.760	0.577	0.565	0.24915

Source: Primary Data (2025)

The R-square value of 0.577 indicates that 57.7% of the variance in operational efficiency is explained by customer integration, with the remaining 42.3% explained by other factors.

Table 5: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.963	1	2.963	47.735	0.001
Residual	2.173	35	0.062		
Total	5.136	36			

Source: Primary Data (2025)

The significant F-statistic ($F = 47.735$, $p = 0.001 < 0.05$) confirms the model's validity.

Table 6: Coefficient Estimates

Model	Unstandardized Coefficients B	Std. Error	Standardized Beta	t	Sig.	95% Confidence Interval for B
Constant	0.577	0.546		1.056	0.298	-0.532 – 1.687
Customer Integration	0.851	0.123	0.760	6.909	0.001	0.601 – 1.101

Source: Primary Data (2025)

The slope coefficient ($\beta_1 = 0.851$) indicates that a one-unit increase in customer integration predicts a 0.851-unit increase in operational efficiency, and the relationship is statistically significant ($t = 6.909$, $p = 0.001 < 0.05$). Consequently, the null hypothesis is rejected.

The findings demonstrate that customer integration is a significant predictor of operational efficiency in Kenya's commercial state corporations. This suggests that organizations that actively engage customers, tailor services to their needs, and incorporate feedback into operational processes experience better performance outcomes. These results align with prior studies by Stig (2018), Devaraj et al. (2017), and Nkirote (2019), which highlight the positive influence of customer integration on organizational performance. The findings are also consistent with Systems Theory, which posits that integrating stakeholders, including customers, enhances overall organizational efficiency.

5 Summary, Conclusions and Recommendations

5.1 Summary

The study examined the effect of customer integration on the operational efficiency of commercial state corporations in Kenya. Customer integration involves actively engaging customers, tailoring services to their needs, and incorporating feedback to improve service delivery. Descriptive analysis indicated that respondents agreed their organizations implement customer integration practices, with an aggregate mean of 4.42 and a standard deviation of 0.654, reflecting relatively low variation in responses.

Correlation analysis revealed a strong positive relationship between customer integration and operational efficiency ($r = 0.760$, $p = 0.001$), while regression analysis demonstrated that a one-unit increase in customer integration predicts a 0.851-unit increase in operational efficiency. The t-statistic (6.909, $p = 0.001 < 0.05$) confirmed that customer integration is a significant predictor of operational efficiency. These findings suggest that frequent communication, customization, and the use of customer feedback enhance timely service delivery, reduce errors, and improve overall operational outcomes in commercial state corporations.

5.2 Conclusion

The study concludes that customer integration positively and significantly influences operational efficiency in Kenya's commercial state corporations. Organizations that actively engage customers, tailor their services, and systematically incorporate feedback achieve better operational performance. This highlights the critical role of customer-centric practices in public sector supply chains, showing that customer integration not only improves service quality but also enhances efficiency in operational processes.

5.3 Recommendations

Commercial state corporations should adopt Customer Relationship Management (CRM) platforms to systematically capture, track, and respond to customer feedback, enabling real-time improvements in service delivery. Interactive customer engagement channels such as surveys, suggestion platforms, and regular meetings with key customers should be established to understand and meet their specific needs. Services should be flexible and tailored to meet varying customer requirements, ensuring responsiveness and higher service quality. Continuous staff training in customer engagement, communication, and feedback utilization should be institutionalized to strengthen operational efficiency. Customer insights should directly inform operational processes, resource allocation, and service planning to reduce errors and enhance overall performance. Implementing these measures will help commercial state corporations strengthen operational efficiency while fostering a customer-focused culture, aligned with Kenya Vision 2030's social pillar and the Citizen Service Delivery Charter.

Declaration of Competing Interests

The authors declare that they are not aware of any competing financial interests or personal relationships that may have influenced the work described in this document.

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Ethical considerations

The article followed all ethical standards appropriate for this kind of research.

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