Influence of Customer Integration and Information Systems Integration on Organizational Performance of Clearing and Forwarding Firms in Kenya

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Abstract

*In the context of digitalization, globalization, and heightened competition in the logistics sector, supply chain integration plays a crucial role in the economic success of Clearing and Forwarding companies in Kenya. The performance of these companies is marked by unsatisfactory customer experiences, stemming from delayed port arrivals, intricate regulations, inefficient document processing, and compliance checks. Consequently, C&F firms' performance is compromised, leading to revenue. This performance challenge may be linked to insufficient customer systems integration. This study aimed to assess how customer systems integration influences the organizational performance of C&F firms in Kenya. The study employed a cross-sectional research design and gathered primary data via structured questionnaires. The sample consisted of 298 employees from departments including operations, customer service, and finance. Descriptive statistics and structural equation modelling were conducted using SPSS and SPSS AMOS 29 for data analysis. The study found that that there are varying degrees of alignment and interaction between the surveyed C&F companies and their customers. Further, the study found that customer systems integration has positive and significant effect (Path coefficient = 0.686***, C.R = 5.078, P.value = <0.001). The study concludes that that customer systems integration has beneficial effects on organizational performance of C&F firms in Kenya. Thus, C&F firms should invest in CRM systems to enable effective customer systems integration. Such systems can centralize customer data, track interactions, and offer insights into customer preferences and behaviour.*

Key Words: Customer systems integration, supply chain integration, organizational performance, Clearing and forwarding.

Introduction

In today's competitive and rapidly changing business landscape, logistics companies are facing the need to prioritize the coordination and seamless integration of their supply chain networks Clearing and Forwarding (C&F) companies' primary goal is to ensure the efficient delivery of goods to clients, cater to their specific requirements, and ultimately elevate the overall performance of the company. Moreover, the evolving expectations of customers concerning logistics services have prompted logistics firms to recognize the vital importance of incorporating their supply chain partners into their operational strategies (Sisodia &

Kumar, 2021). This strategic amalgamation empowers them to establish a competitive advantage in the market and enhance their performance (Gosling et al., 2017).
As highlighted by Yuen and Thai (2017b) customer systems integration entails overseeing and orchestrating the strategies and operations of all supply chain partners, ultimately resulting in the provision of more dependable and responsive logistics services. Customer integration involves complete logistics service planning to satisfy customer needs, effective information system integration with major customers, and the establishment of a fast order system for major customers (Liu & Lee, 2018). Customer integration is seen as critical component of SCI and firm performance. For customer integration to become customer-driven, supply chain has to develop specific capabilities and resources: customization, tailoring of products and services, shared information, flexibility, and alignment with customer needs (Shou et al., 2018; Munir *et al.* 2020). Through customer integration, a logistic service supplier can build lasting strategic partnerships with important clients, which lowers the cost of the search (Jajja et al., 2018).
Extant research shows that customer integration affects different constructs of organization performance. For instance, studies such as that of Yu *et al*. (2018), Afshan and Mutwani (2018) related it with firm performance and their main limitations was that they were conducted in other countries hence their findings cannot be applied to fit the context of C&F companies in Kenya. Other studies such as that of Yeh et al. (2020) related internal integration with supply chain performance, Liu and Lee (2018) related it with service performance, Munir et al. (2020) focused on operational performance and Birasnav and Bienstock (2019) on technological innovations. However, they did not capture all the facets of organizational performance implying that their findings are limited in terms of understanding how customer integration affects OP at aggregate level. Moreover, local studies such as that of Cheruiyot et al. (2018) and Mogaka et al. (2021) focused on other industries other than logistic firms, hence due to operational differences their findings cannot apply to the context of C&F firms in Kenya.

In Kenya, there is inadequate literature on supply chain integration dimensions (customer, information, suppliers, internal) in logistics industry and limited understanding into how it affects various facets of organizational performance. According to Mbugua et al. (2020), SCI adoption is low in Kenya, particularly in the logistics, manufacturing, health, and financial sectors. They discovered that SCI and performance in the service business are still uncertain and that considerable improvements in SCI are still to come. The Kenyan government loses more than Kes 12 billion per year on transit freight due to inefficient and non-strategic supply chains (TMEA, 2019). Chepchirchir (2018) noted that the performance of logistics service providers in Kenya is characterized by poor customer satisfaction due to delayed arrivals at ports, poor efficiency in documents processing and compliance checks leading to low performance of logistics firms and revenue losses to government agencies such as KRA. Low implementation of SCI can be attributed to policy level issues on data integration and top management team inefficiency.

Clearing and forwarding (C&F) firms act as logistics intermediaries between shippers and customers in the procedures of cargo clearance across international borders. They provide specialized logistics services to importers and exporters such as customs clearance, documentation processing, customs bonds management, docking, handling, warehousing and transportation of cargo to customers (Muoki & Moronge, 2021; Mutie et al., 2020). To protect legitimacy, integrity, uniformity and policies of trade, Kenya Revenue Authority (KRA) licenses C& F firms. In Kenya, Kenya International Freight and Warehousing

Association (KIFWA) whose main objective is to enforce the code of conduct among its members and promote consultations with key stakeholders in the supply chain such as KRA, Kenya Ports Authority (KPA), traders and other government agencies (Mutie et al., 2020) is the umbrella body representing C&F firms.

With digitalization, globalization and increased competition in the logistics industry, SCI is vital for the economic performance of C&F sector in Kenya. According to survey conducted by Shippers Council of Eastern Africa (SCEA) in 2021, logistics service providers in Kenya performance is average and their operations characterized by low margins and inefficiency costs such as delays charges, storage costs and penalties levied by regulators. This performance issue may be attributed to low customer systems integration as noted by Kabui *et al*. (2019). While there may be other factors affecting C&F performance, there is missing knowledge into how customer systems integration affects their performance. Thus, the study sought to test the hypothesis (H_{O1}) that customer integration has no statistically significant influence on organizational performance of C&F firms in Kenya.

Methodology

The research employed a cross-sectional design and collected primary data through structured questionnaires. The study target population was 1,919 employees of 88 clearing and forwarding (C&F) firms licensed as Authorised Economic Operators (AEO). Using Yamane formula, a sample size of 331 was determined from the target population. The study excluded 33 respondents who had participated in the pilot study, resulting in a main study sample size of 298 participants. The sampling method utilized was stratified random sampling, where employees were selected from operations, customer service and finance departments. Ultimately, out of the 298 questionnaires administered, 232 were returned, yielding a response rate of 77.85%. Data collected was analysed quantitatively using Statistical Packages for Social Sciences version 25 and AMOS version 29 software. Descriptive statistics (means, standard deviations and percentages) were used to describe the data, while structural equation model was used to test the study hypotheses. To ascertain that the conditions of structural equation modelling were met, preliminary tests (test for outliers, normality test, non-response bias, data factorability, measurement model and model fit assessment) were conducted.

The first step in structural equation modelling involves measurement model (Confirmatory Factor Analysis), where the analyses establishes convergent, discriminant validity, construct reliability and model goodness of fit. After establishing satisfactory measurement model, the last step is to fit the regression paths between concepts. The significant of the path coefficients for the models were examined using critical ratio greater than 1.96 and a p-value less than 0.05 indicating significance at 5% significant level. The decision is to reject null hypothesis was approved if $p<0.05$ and failure to reject the null hypothesis was approved if $p>0.05$ (Chen, 2022).

Statement of Ethics Review

Before commencing the research, all necessary permissions and licenses were diligently obtained to ensure adherence to regulatory requirements. These included a research permit from the Chandaria School of Business at the United States International University and National Commission for Science, Technology, and Innovation (NACOSTI) permit. Participants were provided with clear and comprehensive information regarding the research's objectives, methodologies, and data collection procedures. Their participation was

entirely voluntary and contingent upon the completion of a consent form, ensuring ethical practices were followed throughout the research process.

Results

Test for Outliers

In order to detect the outlying cases, this study evaluated D^2 of each observation using chi-square ($\chi 2$) distribution with a p-value of less than 0.001 and the degree of freedom (DF) equal to the number of independent variables. The results showed that there were no D^2 values that fell under the category of 0.001, hence the data had no outliers.

Non-Response Bias

Two waves of responses (First 100 responses = 1st Wave, the remaining 132 responses = 2nd Wave) were compared using independent t-tests. The p-values obtained from the independent t-tests indicated the level of statistical significance in comparing the two waves of responses hence giving assurance that non-response bias was not a concern for the study.

Normality Test Results

Customer integration had a Shapiro-Wilk statistic of 0.8333 with a p-value of 0.308 and organizational performance had a Shapiro-Wilk statistic is 0.963 with a p-value of 0.089, suggesting a normal distribution.

Descriptive Statistics: Items and Scale Reliability

The findings, presented in Table 1, indicate mixed agreement among respondents on different aspects of organizational performance (Aggregate mean = 3.32, Std = 1.21). Financial performance shows a neutral perception, with some respondents agreeing on positive indicators while others have reservations. Learning and growth exhibit moderate agreement, except for using social media for brand building, which has lower agreement or reservations. This suggests diverse organizational performance among C&F firms in Kenya. The scale, comprising 17 organizational performance items, yielded a reliable Cronbach Alpha value of 0.713.

Table 1. Organizational Performance Items and Scale Reliability

Statements	Mean	Std
Our company transaction costs are low	3.2	1.2
We record profits every financial period	3.3	1.2
We report increased sales and profits year on year	3.3	1.2
Our customers decline to refund storage and demurrage costs when process delays occur	3.0	1.1
We have proper function and effective IT infrastructure	3.3	1.2
Our employees are highly educated and motivated to learn more	3.4	1.2
Our managers exhibit high managerial skills	3.5	1.2
We use social media usage for brand building.	2.8	1.3
Our services are on-time delivery	3.5	1.3
The circumstances of service delivery are always as promised	3.5	1.1
We have sufficient vehicles/trucks for transport	3.7	1.4
We have sufficient warehouse capacity/space	3.3	1.2
Our customers are always satisfied with our services	3.3	1.2

Our investors and owners of the company are satisfied with business profits	3.3	1.2
The government agencies are satisfied with the way we conduct our business and operations	3.4	1.2
Our employees are highly satisfied with our business performance.	3.3	1.2
Our partner(s) are highly satisfied with our systems and efficiency levels	3.4	1.2
Aggregate	**3.32**	**1.21**
Number of Items	17	
Cronbach Alpha	0.713	

Table 1 results revealed that the aggregate mean for the items related to customer integration was 3.06, with a standard deviation of 1.41. This indicate that respondents had mixed perceptions on statements such as real-time information sharing with customers, customers sharing demand forecasts, and the existence of ordering systems with customers. These mixed perceptions suggest a slightly positive but still uncertain view of customer integration in these areas.

Exploratory Factor Analysis Results

The study established that the organizational performance has KMOMSA has 0.692 and the BTS is 0.000. In addition, items under organizational performance generated 4 factors and explained 62.068% of the total variance of the construct. Five items under organizational performance were dropped due to cross-loading and low factor loadings. Customer systems integration consisting of 10 items has the KMOMSA value of 0.964, and the BTS value is 0.000. In addition, it generated 1 factor and the items explained 73.951% total variance of the construct which is more than the cumulative variance of 60%.

Table 2. Descriptive Statistics for Customer Systems Integration

ID	Statement	Mean	Std
CI1	In our company, we have real time information sharing with our customers	3.3	1.4
C12	We encourage customers to raise suggestions and complaints via complaints box	3.2	1.4
CI3	Our major customers share demand forecasts with us	3.1	1.3
CI4	We have an online ordering system with our customers	3.1	1.5
CC1	We frequently conduct customer visits to discuss their needs and preferences	2.8	1.4
CC2	Our customers are highly co-operative	3.1	1.6
CC3	There is mutual trust between our employees and customers in online orders and delivery of services online.	3	1.5
CC4	We encourage customer feedback to improve our decision-making and supply chain processes.	3	1.2
CC5	We believe that our customers are satisfied with our services.	2.8	1.4
CC6	We encourage collaborative engagement with our customers	3.2	1.4
	Aggregate	**3.06**	**1.41**
Number of Items		10	
Cronbach Alpha		0.961	

Analysis of Measurement Model

Convergent Validity

Figure 1 shows the measurement model factor loadings. All items for customer systems integration had SFL greater than 0.4. For organizational performance, items OP1, OP2, OP3, OP4, LG2, LG3, LG4, IPP4, & SP2 had an SFL of less than 0.4, hence were dropped in SEM model to improve construct convergent validity. An AVE greater than 0.4 is generally considered acceptable and indicates that the construct is reliably measured by its indicators (Hair et al., 2016). After dropping items with SFL less than 0.4, CFA model did not have construct convergent concerns.

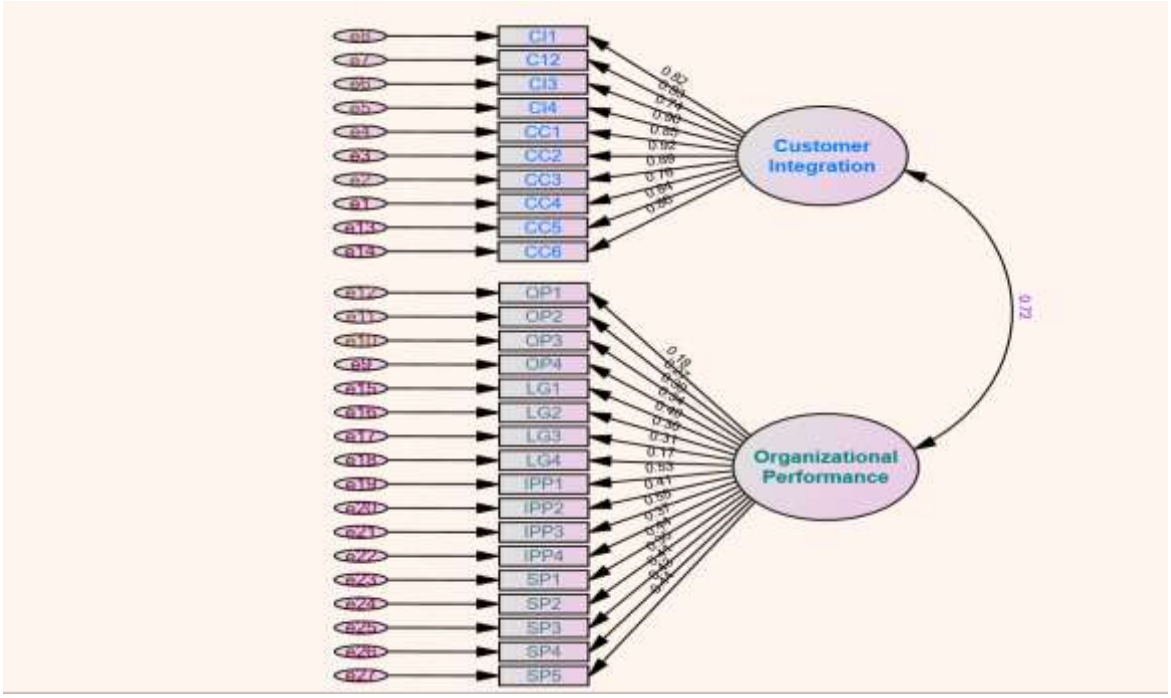

Figure 1. Measurement (CFA) model

Discriminant Validity

The analysis revealed that the square root AVE for customer systems integration is 0.843, which is greater than the correlation coefficient (0.607) between customer systems integration and organizational performance indicating that the model has no discriminant validity concerns.

Model Goodness of Fit

Table 3 displays the goodness-of-fit indices, where RMSEA, CFI, and PCFI revealed that the model possesses an acceptable fit. These indices collectively affirm that the model appropriately represents the observed data and is suitable for further analysis and interpretation.

Table 3. Model Fit Assessment Results

Goodness of Fit Indices	Value	Decision
RMSEA	0.045	The recommended value is < 0.08. Hence the model fit is admissible
CFI	0.975	The recommended value is > 0.9. Hence the model fit is admissible
PCFI	0.854	PCFI should be greater than 0.5. Hence the model fit is admissible

Structural Equation Model Output

The study sought to test the hypothesis H_{O1} that there is no statistically significant influence of customer systems integration on the organizational performance of C&F firms in Kenya. Table 4 shows the path direction from Customer Integration Systems (CSI) to Organizational Performance (OP). The estimate for this path is 0.411, with a standard error of 0.072. The p-value associated with this estimate is also significant at the 0.001 level (***), suggesting a strong relationship between CSI and OP. The standardized estimate for this path is 0.686, indicating that customer systems integration has strong positive effect on organizational performance. This means that when customer systems integration goes up by1 standard deviation C&F organizational performance goes up by 0.686 standard deviations. Thus, the hypothesis (H_{O1}) is rejected based on the significant path estimate, indicating support for the hypothesis that customer systems integration has a positive impact on organizational performance of C&F companies in Kenya. The optimal regression model is as shown in equation 4.2.

$$OP = 0.892 + 0.686CI + \varepsilon \qquad (4.2)$$

Table 4. SEM Output

Path Direction			Estimate	S.E.	C.R.	P. value	Standardized Estimates	Hypothesis Result
CSI	→	OP	0.411	0.072	5.708	***	0.686	Reject **H_{O1}**
Intercept	→	OP	0.892	0.182	4.901	***		
Squared Multiple Correlations = 0.47								

*Where CSI is Customer Systems Integration and Organizational Performance, *** is significant at 0.001 significant level, ** is significant at 0.01 significant level and * is significant at 0.05 significant level.*

Discussion

The study found that customer systems integration has positive and significant effect on organizational performance of C&F firms in Kenya. Given the mixed responses on customer systems integration and organizational performance of C&F, the study argues that companies with low organizational performance also have low customer systems integration and vice versa. The SEM results suggest that improving customer systems integration will improve their organizational performance. Customer systems integration has several beneficial effects

on the organizational performance of C&F firms in Kenya. According to Alkalha, Reid and Dehe (2019) customer systems integration allows for real-time information sharing and seamless communication between the firm and its customers. This customer-centric approach enhances organizational performance by increasing customer satisfaction and loyalty. Additionally, with an online ordering system and shared demand forecasts, customer systems integration enables streamlined and efficient order processing. This integration reduces order processing time, minimizes errors, and improves supply chain management (Gosling *et al*., 2017). Accurate demand forecasting helps optimize inventory levels, reduce stock outs and improve overall operational efficiency. As a result, the firm can meet customer demands promptly, leading to improved customer satisfaction and increased operational performance (Liu & Lee, 2018).

Conclusion

This study concluded that customer systems integration has beneficial effects on organizational performance of C&F firms in Kenya. The C&F firms that effectively integrate their customer systems are more likely to demonstrate higher organizational performance. Conversely, C&F firms with lower levels of customer systems integration are likely to have lower levels of organizational performance. Hence, providing an explanation for the observed variations in performance among the C&F firms in Kenya. The study concludes that the successful integration of customer systems plays a crucial role in enhancing the organizational performance of C&F firms in Kenya.

Recommendations

Firstly, the study suggests that C&F firms should invest in CRM systems to enable effective customer systems integration, centralize customer data, track interactions, and offer insights into customer preferences and behaviour. Secondly, prioritizing data quality and adopting technologies like electronic data interchange (EDI), application programming interfaces (APIs), and data integration platforms can facilitate seamless data exchange between the firm and customers. Lastly, the study advises C&F firms to regularly monitor customer satisfaction and key performance indicators (KPIs) related to customer systems integration. Establishing metrics such as on-time delivery, order accuracy, customer feedback, and repeat business allows firms to identify areas for improvement, address concerns, and make informed decisions to elevate customer systems integration and overall organizational performance.

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