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SUPPLY CHAIN CATEGORY

# CONSUMER INTEGRATION AND PERFORMANCE OF CEMENT MANUFACTURING FIRMS IN KENYA

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## ABSTRACT

**Purpose:** This study sought to determine the effect of consumer integration on the performance of cement manufacturing firms in Kenya.

**Statement of the Problem:** Despite the critical role of supply chain practices in enhancing firm performance, many cements manufacturing firms in Kenya continue to experience performance challenges. There is limited empirical evidence on how consumer integration influences performance in this sector, necessitating this study.

**Methodology:** The study adopted a positivist philosophy and descriptive survey design, targeting 450 supply chain managers, with a sample of 212 selected using stratified and random sampling. Data were collected through questionnaires and analyzed using descriptive statistics, while correlation and regression were used to examine the underlying relationship.

**Findings:** The results indicate that consumer integration has a positive, statistically significant influence on the performance of cement manufacturing firms in Kenya.

**Conclusion:** The study concludes that consumer integration is a key determinant of performance in cement manufacturing firms, and enhancing it can lead to improved organizational outcomes.

**Recommendation:** Cement manufacturing firms should strengthen consumer integration practices to achieve sustained, improved performance. Additionally, the findings provide a basis for future research and policy formulation within the sector and beyond.

**Keywords:** *Consumer integration, Performance of cement manufacturing firms*

## BACKGROUND TO THE STUDY

The performance of the various industries in Kenya, including the cement manufacturing firms, has amplified the attention for both research work (Ngatia, Osoro & Nyang'au, 2024; Wako & Lambiano, 2024; Mwaruta, Karanja & Kamaara, 2023; Hamid, 2021) and the organizational practices involved, such as the supply chain integration (Ngatia *et al*., 2024; Kamara & Noor, 2018). Accordingly, supply chain integration (SCI) has become critical to the success of many organizations, such as cement manufacturing firms (Rosa & Reza, 2020; Huo, Qi, Wang & Zhao, 2015). Rosa and Reza (2020) noted that firms must integrate with their customers and suppliers and maintain extensive collaboration with them to survive. Furthermore, they described SCI as a strategic collaboration between manufacturing firms and their supply chain partners to leverage both internal and external resources and other capabilities.

According to Kumar *et al*. (2017), supply chain members tend to work together to improve firm performance and increase profits while meeting customer demands. In addition, Hamid (2021) and Khan and Wisner (2019) described consumer integration as the process of building and maintaining strong relationships and partnerships with customers by sharing customers' knowledge, products, experiences, services, and suggestions. Accordingly, they opine that the consumers are the source of life for all organizations, such that whatever they provide, whether a product or a service, is used by the organization to grow and survive through the competitive business environment. Therefore, consumer integration is summarized as the core competencies derived from coordinating critical customers to the firm. However, the state of consumer integration in many firms is said to be distinct. For instance, across the globe, consumer integration, like other supply chain integration practices, has become increasingly critical to organizations' performance. In the Iranian industrial sector, consumer integration is practiced alongside other SCI practices, such as internal and supplier integration, to improve firm performance and increase profits (Hamid, 2021).

In the UK and other European countries, firms are said to have accepted that they cannot operate independently and must engage in the participation and collaboration of other supply chain members, such as customers and suppliers (Rosa & Reza, 2020). Furthermore, effective consumer integration and other SCI practices greatly influence both the performance and competitive strategies in china and other Asian countries (Huo, Qi, Wang & Zhao 2015). Similarly, Ngatia et al. (2024), Kariuki and Nafula (2020), Oliveira and Hanfold (2019) opine that innovative SCI strategies in general positively influence the performance of the

manufacturing firms. Nonetheless, this study sought to establish whether consumer integration, as a construct of SCI, affects the performance of cement manufacturing firms in Kenya.

**Statement of the Problem**

The performance of cement manufacturing firms in Kenya reveals significant gaps stemming from underutilized capacity, declining production, and persistent supply chain inefficiencies. In 2024, cement sales dropped by 8% to 8.47 million tonnes, the sharpest decline in over two decades, while production decreased by 12.1% in Q3 alone (Global Cement, 2024; KNBS, 2024). Capacity utilization hovered around 62.2%, highlighting idle production capabilities despite existing infrastructure (CCF2UP, 2024). Thus, despite the cement manufacturing sector accounting for a notable portion of Kenya's GDP and employment, it has been experiencing stagnation and slow growth, with an average annual growth rate of only 7.7% in recent years (KIPPRA, 2022). In addition, prominent cement manufacturing companies, such as Athi River Mining and East African Portland Cement Plc, have experienced a decline, transitioning from industry leaders to loss-making firms within a decade (KNBS, 2024; Mwakilishi, 2024; Kitainge, Bor, & Wanza, 2019). These challenges are exacerbated by fluctuating demand, poor logistics infrastructure, unreliable energy supply, and the proliferation of low-quality cement due to inadequate quality control (KNBS, 2024; Mwakilishi, 2024).

Unlike the ideal supply chain environment characterized by digital integration and real-time coordination (Rudberg & Olhager, 2022; Cooper & Gardner, 2023), Kenyan firms lack visibility and responsiveness across the value chain, hence the use of SCI practices such as consumer integration to help the industry improve performance and remain competitive as well as meet the growing market demands (Chopra & Meindl, 2017). Empirical research reveals significant gaps in understanding and implementing real-time supply chain integration within the cement industry. Studies by Helo and Shamsuzzoha (2020) and Lechler et al. (2019) have explored real-time supply chain processes, but their findings are limited to specific technologies, such as blockchain, or case studies that don't address the comprehensive needs of manufacturing firms. Lee (2021) focused on real-time systems in fashion, underscoring how timely supply chain integration can positively impact performance, but did not directly assess manufacturing. These studies highlight a lack of context-specific research that considers the unique operational challenges and potential benefits of integration within the cement sector. This gap underscores the need for a focused study on how supply chain integration practices, particularly consumer integration, influence the performance of cement manufacturing firms

in Kenya, considering their specific challenges and the current lag in adopting advanced digital solutions.

**Research Objective**

The objective of this study was to determine the influence of consumer integration on the performance of cement manufacturing firms in Kenya.

**Research Hypothesis**

$H_0$: Consumer integration does not significantly influence the performance of cement manufacturing firms in Kenya.

## LITERATURE REVIEW

### Theoretical Review

**Supply Chain Integration Theory**

The study was anchored to the Supply Chain Integration Theory. Integration is a process of interaction and collaboration in which companies in a supply chain work together to achieve mutually acceptable outcomes (Pagell, 2014). Kim and Narasimhan (2018) assert that supply chain integration links an organization with its customers, suppliers, and other channel members by integrating their relationships, activities, functions, processes, and locations. According to Lambert (2004), successful supply chain management requires cross-functional integration of key business processes within the company and across the network of companies that constitute the supply chain. Organizations must integrate their operations with trading partners to sustain competitive advantage across the entire supply chain (Lambert & Cooper, 2020). Power (2019) asserts that integration involves cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes to managing integrated chains of processes. Kwon and Suh (2018) consider supply chain integration to be a strategic tool that aims to reduce costs and thus increase customer and shareholder value. Supply chain integration is an effective approach to improving business performance in a highly competitive market (Narasimhan, Jayaram, & Carter, 2021).

Frohlich and Westbrook (2021) assert that the highest levels of integration with both suppliers and customers are most strongly correlated with high levels of manufacturing firm performance. The major challenge in supply chain integration in the cement manufacturing firms is to coordinate activities across the supply chain so that the enterprise can improve

performance by reducing costs, increasing service levels, reducing the bullwhip effect, better utilization of resources, and effectively responding to changes in the marketplace (Simchi-Levi et al., 2019). Chopra and Meindl (2015) argue that supply chain coordination occurs when all stages of the supply chain work toward maximizing total supply chain profitability, rather than each stage pursuing its own profitability.

## Conceptual Framework

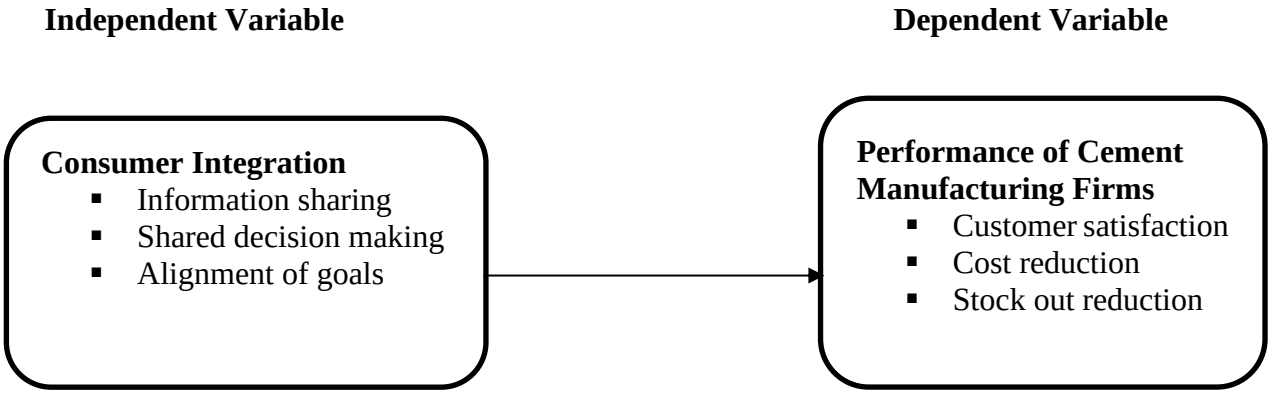


**Figure 1: Conceptual Framework**

### Consumer Integration

Consumer integration refers to the process of building and maintaining strong relationships and partnerships with customers by sharing knowledge, products, experiences, services, and suggestions from consumers themselves (Ngatia *et al.*, 2024; Hamid, 2021; Kariuki & Nafula, 2020). According to Tan *et al*. (2018), consumer integration is a 'demand management practice which involves long-term customer relationship, satisfaction improvement, and complaint management.' Consequently, the fundamental aspect of customer relationships is the focus on key customers to understand their needs and requirements and to satisfy them. Therefore, consumer integration encompasses various activities and practices, such as integrated problem-solving initiatives, direct customer contact, managing consumer complaints, increasing customer satisfaction, and establishing long-term relationships with customers (Sousa, 2023). It is viewed as a practice that involves the core competencies of coordinating with critical customers to better understand their needs and aligning the organization's functions to create customer value. By so doing, consumer integration is expected to yield different benefits to the firm which include the ability to differentiate their products from competitors, increased market share and retention of profitable customers, improved customer loyalty, quick resolving potential problems, shared knowledge and expertise concerning new technologies, a deep

understanding of consumer needs and rapid responses to customers (Wasti & Jeffrey, 2019). Therefore, a close relationship between consumers and manufacturers offers opportunities for improving the accuracy of demand information, which reduces the manufacturer's product design and production planning time and inventory obsolescence, allowing it to be more responsive to customer needs (Zhnag *et al.*, 2022). Since consumer integration generates opportunities for leveraging the intelligence embedded in collaborative processes, it enables manufacturers to reduce costs, create greater value and detect demand changes more quickly (Cui *et al*., 2022) through sharing demand information, interacting with customers to set reliability, responsiveness and other standards to understand customer needs better and to forecast better customer demand (Homburg &Stock, 2018).

On the other hand, firm performance refers to the extent to which an organization achieves a set of pre-defined targets aligned with its mission, vision, and goals. These targets include both objective (numerical) and subjective (judgmental) indicators (Maduenyi *et al*., 2019). Studies have used market and financial criteria to operationalize organizational performance in terms of market share, return on investment, growth of sales, profit margin on sales, growth of market share and growth of return on investment. These studies have also contributed to investigating the relationships among operational performance, organizational performance, and SCM practices (Carroll, Johansen, & Mouritsen, 2021). There are three main categories of supply-chain-driven organizational performance (Wu, Chuang, & Hsu, 2019). The first category, resource performance, sees value as a way of achieving efficiency. The second category, output performance, views value addition as an organization's ability to provide high levels of customer service. The last category, flexibility performance, views value addition as an organization's ability to respond. These categories have seen increased attention by researchers in recent years. However, the relationship between SCI and the performance of various firms has been explored in many studies. For instance, Reaidy, Lavastre, Ageron, and Chaze-Magnan (2021) discussed insights and observations from an exploratory empirical study of 50 semi-structured interviews with supply chain managers and functional managers involved in consumer integration issues in France across various sectors. Thanks to qualitative analysis, empirical practices of consumer integration are identified in supply chain management processes. They concern three domains: Research & development, planning and distribution. The study proposed a definition of consumer integration in supply chain management and a consumer integration taxonomy, based on three dimensions (information sharing, shared decision-making and alignment of goals).

Accordingly, Yeh, Pai and Wu (2020) examined the relationship between consumer integration and relationship stability and the relationship between relationship stability and performance; furthermore, the moderation effect of environmental uncertainty on supply chain integration and relationship stability was analyzed. The subjects are typical small and medium-sized enterprises (SMEs) in developing countries that compete in niche markets against large-scale manufacturers. Questionnaires were distributed to manufacturers to collect empirical data; in total, 566 valid samples were gathered. The results indicated that supply chain integration positively affects relational stability, and that relational stability positively affects supply chain performance. Relational stability is a mediator between supply chain integration and supply chain performance. Martinelli and Tunisini (2019) explored the topic of consumer integration into supply chains. Particular attention is paid to literature on customer-driven and customer-centric supply chains. The paper presents a systematic literature review conducted using a consolidated methodology. The protocol used allows for the identification, analysis, synthesis, reporting and discussion of the results stemming from the literature on consumer integration into the supply chain. Using the results of the literature review, the authors first systematized the literature on customer-driven and customer-centric supply chains within the conceptual framework. For each of the two sets of studies, the authors highlighted three main streams of research concerning consumer integration into the supply chain.

Accordingly, Ruzo-Sanmartín, Abousamra, Otero-Neira, and Svensson (2023) sought to show how to improve supply chain performance through the relationship between firms and their customers. The aim was to detail a way to improve supply chain performance by examining the relationship between companies and their customers. The empirical analysis was based on a survey of 205 corporate-Egypt multi-industry businesses, including manufacturing, retailing, wholesaling, and shipping services firms. A conceptual model was designed, and hypotheses were analyzed with covariance-based structural equation modelling. The findings indicated that firms' relationship commitment does not relate directly to supply chain performance, but rather indirectly through integration both with and by customers.

**Performance of Cement Manufacturing Firms in Kenya**

Organizational performance refers to the extent to which an organization achieves a set of pre-defined targets aligned with its mission, vision, and goals. These targets will include both objective (numerical) and subjective (judgmental) indicators (Maduenyi et al., 2029). Studies have used market and financial criteria to operationalize organizational performance in terms of market share, return on investment, growth of sales, profit margin on sales, growth of market

share and growth of return on investment. These studies have also contributed to the investigation of the relationship among operational performance, organizational performance and SCM practices (Carroll, Johansen, & Mouritsen, 2021). There are three main categories of supply-chain-driven organizational performance (Wu, Chuang, & Hsu, 2019). The first category, resource performance, sees value as a way of achieving efficiency. The second category, output performance, sees value addition as the ability of an organization to provide high levels in customer service. The last category, flexibility performance, views value addition as an organization's ability to respond. These categories have seen increased attention by researchers in the recent years.

**Empirical Review**

**Consumer Integration and Performance of Cement Manufacturing Firms**

Reaidy et al. (2021) study discussed insights and observations from an exploratory empirical study with 50 semi-structured interviews with supply chain managers and functional managers involved in consumer integration issues, in France from various activity sectors. Thanks to qualitative analysis, empirical practices of consumer integration are identified in supply chain management processes. They concern three domains: R&D, planning and distribution. The study proposed a definition of consumer integration in supply chain management and a consumer integration taxonomy, based on three dimensions (information sharing, shared decision-making and alignment of goals).

Yeh, Pai, and Wu (2020) examined the relationships between supply integration and relationship stability, and between relationship stability and performance; furthermore, the moderating effect of environmental uncertainty on supply chain integration and relationship stability was analyzed. The subjects are typical small and medium-sized enterprises (SMEs) in developing countries that compete in niche markets against large-scale manufacturers. Questionnaires were distributed to manufacturers to collect empirical data; in total, 566 valid samples were gathered. The results indicate that supply chain integration positively affects relational stability and that relational stability positively affects supply chain performance. Relational stability is a mediator between supply chain integration and supply chain performance.

Martinelli and Tunisini (2019) explored the topic of customer integration into supply chains. Particular attention is paid to literature on customer-driven and customer-centric supply chains. The paper presents a systematic literature review conducted using a consolidated methodology.

The protocol used allows for the identification, analysis, synthesis, reporting and discussion of the results stemming from the literature on customer integration into the supply chain. Using the results of the literature review, the authors first systematized the literature on customer-driven and customer-centric supply chains within the conceptual framework. For each of the two sets of studies, the authors highlighted three main streams of research concerning customer integration into the supply chain.

Rizo-sanmartin et al. (2023) study sought to show how to improve supply chain performance through the relationship between firms and their customers. The aim is to detail a way to increase supply chain performance through the relationship between companies and their customers. The empirical analysis was based on a survey on 205 corporate-Egypt multi-industry businesses, including manufacturing, retailing, wholesaling, and shipping services firms. A conceptual model was designed, and hypotheses were analyzed with covariance-based structural equation modelling. The findings indicate that firms' relationship commitment does not relate directly to supply chain performance, but rather does so indirectly through integration with and by customers.

## RESEARCH METHODOLOGY

This research study adopted a descriptive survey research design involving a self-administered questionnaire to 212 respondents drawn from a target population of 450 working as supply chain- managers in the nine cement manufacturing firms registered under the Kenya Association of Manufacturers in Kenya (KAM, 2024). Furthermore, a stratified sampling technique, with a proportionate allocation of sample sizes based on the specific target populations within each cement manufacturing firm (strata), was used, followed by simple random sampling within each stratum. The consumer integration construct was measured using the information sharing, shared decision-making, and alignment-to-goals subconstructs, with an extensively validated 6-item questionnaire adapted from previous research articles. Eshiteti (2019) opined that to construct new measures for similar situations and variables can be very wasteful in research. All the items were measured on a five-point Likert scale that ranged from 1=Strongly Disagree to 5= Strongly Agree. The Cronbach alpha coefficient for the data obtained was 0.82. Similarly, performance of cement manufacturing firms was measured by customer satisfaction, cost reduction and stock out reduction as adapted from previous studies. It used a total of 6 questionnaire items for its measurement. Descriptive statistics of percentages were used to analyze the data, followed by bivariate correlation and linear regression analyses to test whether consumer integration has a significant influence on the performance of cement

manufacturing firms in Kenya. The estimated linear regression model used to determine the relationship is as shown below;

$$Y = \alpha + X1\beta 1 + \mu \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (I)$$

Where Y is Performance of cement manufacturing firms;

$X_1$ is consumer integration;

$\beta_1$ is the regression coefficients

$\mu$ is the error term; $\alpha$ is a constant/the y- intercept

## RESEARCH FINDINGS

This research study conducted both descriptive analyses of means, standard deviations, and percentages, and inferential analyses of correlations and linear regression. The findings were discussed and presented in the tables as shown.

### Descriptive Statistics

### Consumer Integration

This study sought to determine the effect of consumer integration on the performance of cement manufacturing firms in Kenya. Six questionnaire items for the consumer integration construct, measured on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree, were used, and the results are presented in Table 1.

Consequently, the findings in Table 1 indicated that the majority (40.0 percent) of respondents held the view that the quality of information shared with other functional departments is quite high. Another 6.7 percent of respondents strongly agreed that this was the case. On the other hand, only 8.0 percent of respondents strongly disagreed with this view, while another 18.7 percent simply disagreed with the statement. Nonetheless, another 26.7 percent of those who participated in the study could neither agree nor disagree with the same statement. The high positive responses to this statement had a mean score of 3.118 and a standard deviation of 0.703.

Similarly, 33.3 percent (a majority) of participants in this research study agreed that their organization encourages cooperation with customers and suppliers alike in decision-making.

Another 26.0 percent strongly agreed with the same statement. Nonetheless, only 8.0 percent of respondents strongly disagreed with the statement, while another 5.3 percent simply disagreed. 27.3 percent of the respondents could neither agree nor disagree with the said statement. Further, a mean of 3.981, and a standard deviation of 0.905 was obtained.

In line with the previous response, a majority (41.3 percent) of respondents agreed that their firms align their goals with those of their customers and suppliers. In addition, another 26.7 percent strongly agreed with this statement. On the contrary, only 6.0 percent of respondents disagreed with the same statement, with another 4.0 percent strongly disagreeing. On the other hand, 22.0 percent of those surveyed were unable to agree or disagree with the statement. Equally, this statement's responses generated a mean of 3.954 with a standard deviation of 1.013.

Similarly, the majority (39.3 percent) of respondents agreed that their organizations facilitate the sharing of high-quality information internally to support company operations and management. Another 27.3 percent strongly agreed with the same statement. On the contrary, a total of 7.3 percent of the said respondents disagreed with this statement. Nonetheless, 18.0 percent of these respondents remained indifferent to the statement. However, the response had a mean of 3.888 with a standard deviation of 0.957.

Accordingly, a majority (37.3 percent) of respondents strongly agreed that their organization shares the decision reached and information with both the firm's customers and suppliers, with another 24.7 percent simply agreeing with the same statement. Consequently, a total of 6.0 percent strongly disagreed with the statement, with another 8.7 percent of those who participated simply disagreeing. Substantially, 23.3 percent of respondents could neither agree nor disagree with the same statement. On another front, this statement did generate a mean of 3.835 and a standard deviation of 0.843.

Similarly, a majority (54.0 percent) of respondents agreed that their organization's inventory management practices minimize stockouts and ensure product availability. Consequently, a further 26.0 percent of the participants in this research strongly agreed with the statement. On the other hand, only 7.3 percent disagreed with the statement, while only 4.7 percent strongly disagreed. Nonetheless, another small number (8.0 percent) of respondents were unable to agree or disagree with the said statement. It attained a mean of 3.956 and a standard deviation of 0.594. These results are shown in Table 1.

**Table 1: Consumer Integration**

| | | 1 % | 2 % | 3 % | 4 % | 5 % | mean | Std dev. |
|---|---|---|---|---|---|---|---|---|
| 1 | The quality of information shared with other functional departments is high | 8.0 | 18.7 | 26.7 | 40.0 | 6.7 | 3.118 | .703 |
| 2 | My organization encourages cooperation with our customers and suppliers in decision-making | 8.0 | 5.3 | 27.3 | 33.3 | 26.0 | 3.981 | .905 |
| 3 | My organization ensures that we align our goals with our customers and suppliers | 4.0 | 6.0 | 22.0 | 41.3. | 26.7 | 3.954 | 1.013 |
| 4 | My organization facilitates the sharing of high-quality information internally to facilitate operation and management | 8.0 | 7.3 | 18.0 | 39.3 | 27.3 | 3.888 | .957 |
| 5 | My organization shares decisions and information with our suppliers and customers | 6.0 | 8.7 | 23.3 | 24.7 | 37.3 | 3.835 | .843 |
| 6 | My organization's inventory management practices minimize stockouts and ensure product availability | 4.7 | 7.3 | 8.0 | 54.0 | 26.0 | 3.956 | .594 |
| | **Aggregate** | | | | | | **3.886** | **0.863** |

**Performance of Cement Manufacturing Firms**

This research study examined how well cement manufacturing firms in Kenya perform in terms of customer satisfaction, cost reduction, and stockout reduction. Therefore, the performance of cement manufacturing firms was operationalized using six (6) questionnaire items and subdivided into the customer satisfaction, cost reduction, and stock-out reduction subconstructs, as adapted from previous research. All measures of firm performance used a 5-point Likert scale from 5= strongly agree (SA) to 1= strongly disagree (SD), and the results are shown in Table 2.

According to Table 2, a majority (49.3 percent) of respondents reported that manufacturing processes in their firms consistently meet or exceed customer expectations for product quality. Another 27.3 percent of the respondents strongly agreed with the same statement. On the other hand, 9.3 percent of respondents disagreed with the same statement, while 6.0 percent strongly disagreed. 8.0 percent of the respondents could not agree or disagree with the said statement. A mean and standard deviation of 3.996 and 1.008 were obtained, respectively.

Similarly, the results in Table 2 revealed that a majority (56.7 percent) of respondents agreed that their organizations regularly gather customers' feedback and use it to improve manufacturing processes and product offerings. Accordingly, 26.0 percent of the respondents strongly agreed with the said statement. On the contrary, 6.0 percent of participants disagreed with the statement, while another 4.7 percent strongly disagreed. However, 6.7 percent of those surveyed could neither agree nor disagree with the same statement. The statement's response gave a mean of 3.950 and a standard deviation of 1.030.

Furthermore, the findings in Table 2 revealed that a majority (48.0 percent) of respondents indicated that their organizations have a high rate of repeat customers, indicating strong customer satisfaction with their products and services. Consistently, another 25.4 percent strongly agreed with the said statement. Nonetheless, 11.9 percent of the respondents could not agree with the statement, while 6.0 percent disagreed strongly. 8.7 percent could not agree or disagree with the said statement, which also gave a mean of 3.885 and a standard deviation of 0.909

In addition, the results in Table 2 show that a majority (54.0 percent) of respondents agreed that their firms have implemented effective, cost-effective strategies in manufacturing processes. Another 26.0 percent strongly agreed with the same statement. However, 7.3 percent of respondents could not agree with the statement, while another 4.7 percent strongly disagreed. Only 8.0 percent could neither agree nor disagree with it. A mean and standard deviation of 3.868 and 1.258 were obtained, respectively.

Consequently, the findings in Table 2 indicated that a majority (36.7 percent) of respondents agreed strongly that their organizations continually seek ways to reduce manufacturing costs without compromising product quality. Consistently, another 38.0 percent of respondents agreed with the statement as declared. On the other hand, the results indicated that 16.0 percent of respondents disagreed, 2.7 percent strongly disagreed, and 6.7 % could not agree or disagree. Means of 3.871 and a standard deviation of 1.177 were obtained, respectively.

Equally, the findings in Table 2 show that a majority (44.0 percent) of respondents agreed that their organizations' cost-saving initiatives have led to a significant reduction in the overall production costs. 40.7 percent of the respondents in this study strongly agreed with this view; however, only 8.0 percent of the respondents could not agree with the said statement, with another 4.7 percent strongly disagreeing with it, while 2.7% could not agree or disagree. A mean and standard deviation of 3.869 and 0.765 were obtained, respectively. The findings had

an aggregate mean of 3.827 with a standard deviation of 0.838. These findings are presented and shown in Table 2.

**Table 2: Performance of Cement Manufacturing Firms**

| | | 1 % | 2 % | 3 % | 4 % | 5 % | Mean | Std. dev. |
|---|---|---|---|---|---|---|---|---|
| 1 | The manufacturing processes in our firm consistently meet or exceed customer expectations in terms of product quality. | 6.0 | 9.3 | 8.0 | 49.3 | 27.3 | 3.996 | 1.008 |
| 2 | My organization gathers customer feedback regularly and uses it to improve the manufacturing processes and product offerings | 4.7 | 6.0 | 6.7 | 56.7 | 26.0 | 3.950 | 1.030 |
| 3 | My organization has high rate of repeat customers, indicating strong satisfaction with our products and services | 6.0 | 11.9 | 8.7 | 48.0 | 25.4 | 3.885 | 0.909 |
| 4 | My firm has implemented effective cost-reduction strategies in the manufacturing processes | 4.7 | 7.3 | 8.0 | 54.0 | 26.0 | 3.868 | 1.258 |
| 5 | My organization continuously seek ways to reduce manufacturing costs without compromising on product quality | 2.7 | 16.0 | 6.7 | 36.7 | 38.0 | 3.871 | 1.177 |
| 6 | My organization's cost-saving initiatives have led to a significant reduction in overall production costs | 4.7 | 8.0 | 2.7 | 44.0 | 40.7 | 3.869 | 0.765 |
| | **Aggregate** | | | | | | **3.827** | **0.838** |

**Inferential Analysis**

To test for the effect of consumer integration on the performance of cement manufacturing firms in Kenya, a correlation (bivariate) and linear regression analyses were carried out. The result of the correlation analysis is presented in Table 3 and interpreted.

**Table 3: Correlation Matrix**

| | | Consumer integration | Firm performance |
|---|---|---|---|
| Consumer integration | Pearson Correlation | 1 | |
| | Sig. (2-tailed) | | |
| | N | 170 | |
| Firm performance | Pearson Correlation | .555** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 170 | 170 |

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

The findings obtained in Table 3 (correlation matrix) show that consumer integration has a positive and significant effect on the performance of cement manufacturing firms in Kenya (r=0.555**, p<0.01). This finding was supported by previous research (Li, Li, Li & Xu, 2025; Ngatia *et al*., 2024; Hamid, 2020; Rosa & Reza, 2020; Kariuki & Nafula, 2020; Njagi & Muli, 2020; Kamwara & Noor, 2018). Accordingly, Kamwara and Noor (2018) sought to determine the role of supply chain integration on the performance of cement manufacturing firms in Kenya. The findings indicated that supply chain integration practices, such as supplier integration and information sharing, positively affect firms' performance. However, the study also indicated that this effect can be enhanced through the use of information technology. Furthermore, Rosa and Reza (2020) noted that several studies have examined the effect of SCI practices on firm performance and found a positive, significant relationship between the two. Consequently, SCI has become increasingly critical for the success of any organization (Rosa & Reza, 2020; Njagi & Muli, 2020; Huo *et al*., 2014). Thus, for organizations to survive, they need to integrate with their customers and suppliers and collaborate extensively with them. Similarly, Ngatia *et al*. (2024) noted that consumer integration promotes joint product development, information sharing, demand planning, customer-centricity, and collaboration, hence increased performance.

**Regression of Consumer Integration and Performance of Cement Manufacturing Firms**

To determine the amount of variation in the independent variable (consumer integration) that would explain a given change in the predicted variable (performance of cement manufacturing firms), a linear regression analysis was conducted, and the results are presented in Table 4. In view of the results, it was established that consumer integration has a positive and significant effect on cement manufacturing firms' performance (r = 0.555**, p < 0.01). However, in order to determine the specific amount of effect, consumer integration (predictor variable) was regressed against firm performance, and the results are presented in Tables 4 and 5 and interpreted thereof.

**Table 4: Model Summary**

| | | | | | Change Statistics | | |
|---|---|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | Sig. F Change |
| 1 | .555[a] | .308 | .305 | .44068 | .308 | 92.187 | .000 |

a. Predictors: (Constant), Consumer Integration

The results shown in Table 4 indicate the amount of variation in the dependent variable (performance of cement manufacturing firms) as explained by the independent variable (consumer integration). These findings revealed that the correlation coefficient, R, was 0.555, and the coefficient of determination, R^2, was 0.308. This implies that 30.8 percent of the corresponding change in firm performance can be explained by consumer integration. Furthermore, the results in Table 4 yielded an F-Change value of 92.187, with $p < 0.01$. This value is adequate to support the regression model's goodness of fit, which explains variation in firm performance. Hence, this confirms the usefulness of consumer integration as a factor affecting the performance of cement manufacturing firms in Kenya. Table 5 shows the unstandardized coefficients of the variable consumer integration.

**Table 5: Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | **B** | **Std. Error** | **Beta** | **T** | **Sig.** |
| 1 | (Constant) | 1.674 | .474 | | 5.013 | .000 |
| | Consumer integration | .710 | .084 | .555 | 9.749 | .000 |

a. Dependent Variable: Performance of cement manufacturing firms

Based on the findings in Table 5, the standardized coefficient β for the computed scores of consumer integration was 0.555, with a t-value of 10.549, at $p < 0.05$. Since the obtained t-value is greater than 1.96, the estimated regression model reported in Table 5 is significant and feasible. Further, with $p < 0.05$, this suggests that for every 5-percentage-point increase in consumer integration, there is a predicted increase in the percentage of firms with zero performance. Hence, having achieved the set objective, the study rejected the null hypothesis, stating that $H_{01}$: consumer integration has no significant effect on the performance of cement manufacturing firms in Kenya.

**Summary**

This research study sought to determine the effect of consumer integration on the performance of cement manufacturing firms in Kenya. The results indicated that consumer integration had a positive and significant effect on the performance of cement manufacturing firms (R = .555, R2 = 0.308). Nonetheless, the correlation coefficient and coefficient of determination from linear regression analysis indicated that consumer integration had a positive and significant effect on firm performance, and thus this research study rejected the corresponding null

hypothesis that consumer integration has no significant effect on the performance of cement manufacturing firms in Kenya.

## CONCLUSION

Based on the findings of this study, it was concluded that there is a positive and significant correlation between consumer integration and cement firms' performance in Kenya. This implies that when consumer integration practice is low, the performance of cement manufacturing firms will also decline.

## RECOMMENDATIONS

The findings of this research study show that consumer integration practice was positively and significantly correlated with the performance of cement manufacturing firms in Kenya. This means that the effect of consumer integration on cement manufacturing firms' performance was positive and statistically significant. Therefore, the recommendations of this study are that there should be deliberate efforts to integrate consumers into the supply chain through key practices such as information sharing, shared decision-making, joint product development, customer relationship management, and forecasting, as well as sharing demand and sales data.

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