



SUPPLY CHAIN COLLABORATION STRATEGIES AND DELIVERY PERFORMANCE OF BRICK MANUFACTURING FIRMS IN SOUTHWEST, NIGERIA

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ABSTRACT: *This study explored the relationship between supply chain collaboration strategies and delivery performance of brick manufacturing firms in Southwest Nigeria. The study adopted the positivist research philosophy and the correlational research design. The population of this study comprised 132 functional brick manufacturing firms that are registered with the Manufacturers Association of Nigeria (MAN) in Southwest geopolitical Zone. Sixty-two (62) brick manufacturing firms were selected for the study using a purposive sampling method. The unit of analysis consisted of strategic managers, tactical managers and operational managers of the 62 selected brick manufacturing firms in Southwest Nigeria. A sample size of 186 managers of the above categories was drawn from the 62 selected brick manufacturing firms in Rivers State at ratio of 3 managers per firm. Data were collected from the respondents using a structured questionnaire. The data collected were analyzed statistically, while the Pearson Product Moment Correlation Coefficient (PPMCC) and the SPSS version 24 were used to test the hypotheses. The findings revealed that vertical collaboration has a significant relationship with on-time delivery of brick manufacturing firms. The study also found a significant relationship between vertical collaboration and cost-effective delivery of brick manufacturing firms. The study equally reported a significant relationship between horizontal collaboration and on-time delivery of brick manufacturing firms. Horizontal collaboration was also reported to have significant relationship with cost-effective delivery of brick manufacturing firms. From the findings, it was concluded that supply chain collaboration strategies such as vertical and horizontal collaboration significantly enhance delivery performance of brick manufacturing firms in Southwest Nigeria. Therefore, it was recommended that brick manufacturing firms in Southwest Nigeria particularly those that are currently experiencing poor delivery performance, should adopt collaboration strategies, as it would improve their delivery performance.*

KEYWORDS: Supply chain collaboration, vertical horizontal, horizontal collaboration, delivery performance, on-time delivery, and cost-effective delivery.



INTRODUCTION

In a typical supply chain where members work independently to achieve their goals, there is a need for the key players to collaborate to improve their delivery performance. The growing demand of customers has made it necessary for members of a supply chain to collaborate to meet customers' growing demand in a timely and cost-effective manner. When a firm operating along a supply chain meets customer demand in a timely and cost-effective manner, such a firm can be said to have produced an exceptional delivery performance (Issah et al., 2025). However, a firm cannot independently meet the growing demand of customers in this 21st century unless they collaborate with other members of their supply chain to improve their delivery performance. Without collaboration, it will be difficult for a firm to meet customer demand satisfactorily (Panahifar et al., 2018). Therefore, it becomes imperative for brick manufacturing firms to collaborate with other members of their supply chain to improve their delivery performance.

Collaboration is a process where two or more members of a supply chain work together to realize shared goals (Kumar et al., 2017). It is a cooperative venture with a deep and collective effort to reach an identical goal and objectives. Collaboration along the supply chain ranges from simple partnership and crowdfunding to a more complex cooperation between two or more members of the chain. Collaborative supply chain is not all about developing relationships between partnering companies along the supply chain but also includes the integration of existing knowledge, skills, expertise, experience and technological resources into the supply project to make it a success for both partners (Doganay & Ergun, 2017). Collaborative supply chains do not only promote knowledge sharing among partnering firms in a supply chain but, also make it easier for the firms to execute projects in a timely and cost-effective manner (Hofman et al., 2020).

Supply chain collaboration could take the form of vertical or horizontal collaboration (Jimenez-Jimenez et al., 2019). Effective collaboration among members of a supply chain requires a major focus on culture, technological deployment, implementation of process innovation, and governance for positive results (Mofokeng & Chinomona, 2019). The success of any collaborative supply chain depends largely on how fast the partnering companies open up and work together. A project that would probably take up to one or two years can be reduced to a few months to complete if members of the supply chain collaborate with each other. Thus, collaboration enables members of a supply chain to contribute their unique expertise to get supply projects done. Multiple ideas make it easier for collaborating companies to arrive at better decisions (Myamba et al., 2024). Kumar et al (2017) opined that collaboration brings about creativity via sharing of knowledge, learning and building consensus.

Supply chain collaboration is a strategic and powerful tool for improving the delivery performance of firms. According to Nguyen et al. (2022), a company can improve its delivery performance by cooperating with members of its supply chain. Collaborating with members of a supply chain helps a firm to grow and become open to new ideas and opportunities. Such strategy enables a company to boost its capacity to grow and take the business to a greater height. Ahmad et al. (2020) stated that outside knowledge is critical to the innovative performance of firms. When companies in a supply chain leverage on the power of collaboration and open up while working together on a massive supply project, they will gain knowledge, expertise and experience from each other and improve their delivery performance.



It is against this backdrop that this study examined the relationship between supply chain collaboration strategies and delivery performance of brick manufacturing firms in Southwest Nigeria.

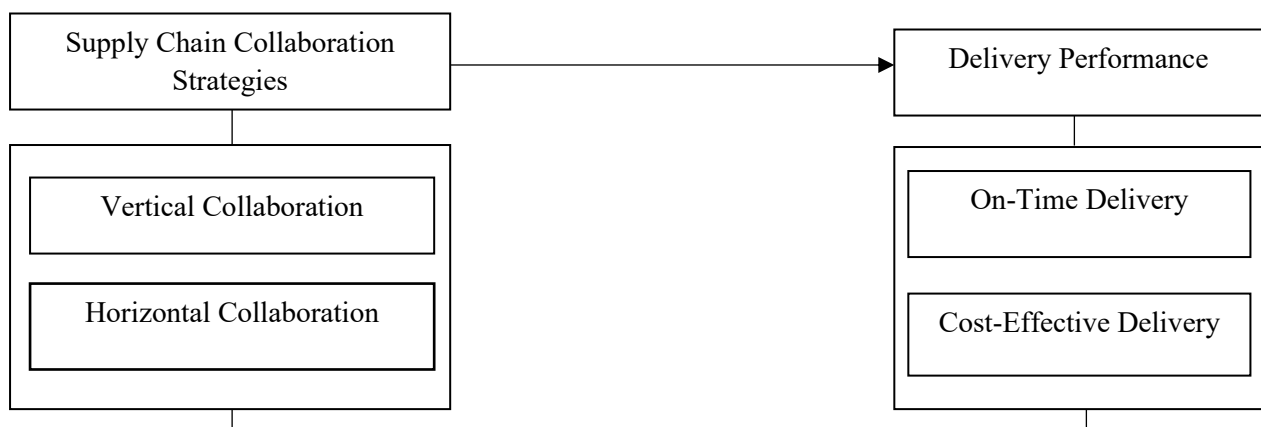
Statement of the Problem

One of the major challenges facing manufacturing firms in Nigeria is how to improve their delivery performance. Many manufacturing firms in Nigeria are experiencing poor delivery performance, resulting in substantial loss of their customers, which lowers profitability. Given this situation, it becomes necessary for these firms to develop strategies to improve their delivery performance. Recently, some brick manufacturing firms in Nigeria have adopted collaboration strategies, forming strategic alliances and partnerships with members of their supply chain to improve their delivery performance. However, ever since these firms adopted collaborative supply chain strategies, it is still not certain whether such strategies have improved their delivery performance, as empirical studies that examined the relationship between supply chain collaboration strategies and delivery performance of bricks manufacturing firms in Nigeria are remarkably absent in literature. This has created a vacuum in supply chain literature, which this study intends to fill and contribute to the existing stock of knowledge.

Conceptual Framework

Fig 1: Conceptual framework of supply chain collaboration strategies and delivery performance of brick manufacturing firms in Southwest Nigeria

The conceptual framework of supply chain collaboration strategies and delivery performance of brick manufacturing firms is shown in Figure 1 below:



Source: *Author's Conceptualization*

Aims and Objectives of the Study

The aim of this study is to examine the relationship between supply chain collaboration strategies and delivery performance of brick manufacturing firms in Southwest Nigeria. The specific objectives of the study are to:



1. determine the relationship between vertical collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria;
2. ascertain the relationship between vertical collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria;
3. determine the relationship between horizontal collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria;
4. ascertain the relationship between horizontal collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria.

Research Questions

The following research questions are raised to address the objectives of the study:

1. What is the relationship between vertical collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria?
2. To what extent does vertical collaboration relate to cost-effective delivery of brick manufacturing firms in Southwest Nigeria?
3. What is the relationship between horizontal collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria?
4. To what extent does horizontal collaboration relate to cost-effective delivery of brick manufacturing firms in Southwest Nigeria?

Research Hypotheses

The following hypotheses were formulated to guide this study:

Ho₁: There is no significant relationship between vertical collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria.

Ho₂: There is no significant relationship between vertical collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria.

Ho₃: There is no significant relationship between horizontal collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria.

Ho₄: There is no significant relationship between horizontal collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria.

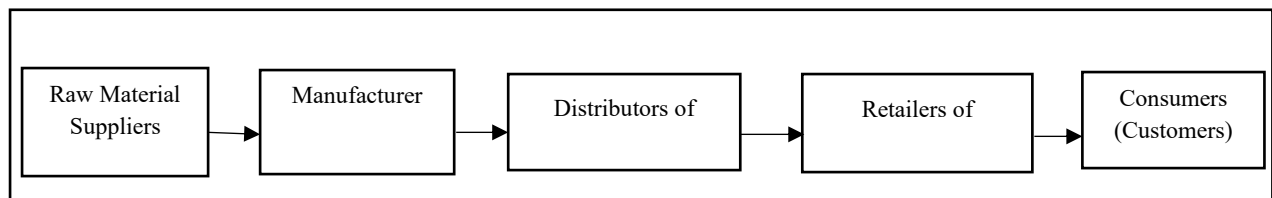


REVIEW OF RELATED LITERATURE

Concept of Supply Chain Collaboration

Supply chain collaboration is a strategy whereby two independent firms decide to work together to execute a project or activity to achieve a shared goal (Turk & Ybarra in Doganay & Ergun, 2017). A firm may decide to collaborate with another members of its supply chain if it believes that it cannot perform certain activities alone to meet customer demand satisfactorily. Supply chain collaboration is considered as a strategic tool for firms to remain stable in the business environment (Ramanathan et al., 2014). Talavera (2014) posited that collaborative initiatives provide opportunities for firms to benefit from the facilities of their partners and improve their delivery performance. When independent firms work together, they create superior value for the end customers and have a greater chance of success than when they are working separately (Yunus, 2019). Uddin (2022) stated that collaboration allows firms to share information, resources and risks while performing certain supply activities jointly. It also helps firms to reduce their costs, shorten their lead time, and improve their product quality. Mofokeng and Chinomona (2019) opined that collaboration is the driving force behind effective management of supply chain activities of firms. According to them, supply chain collaboration helps firms to achieve operational efficiency, increase profitability and improve their delivery performance. A typical supply chain network is shown in Figure 1.

Fig 1: Supply Chain Network



Source: Yunus (2019)

Dimensions of Supply Chain Collaboration

Supply chain collaboration strategies can take different dimensions. However, the dimensions of supply chain collaboration considered in this study are vertical collaboration and horizontal collaboration.

Vertical Collaboration

According to Barratt in Nguyen et al, (2022), vertical collaboration occurs when a firm collaborates with customers, employees and suppliers to facilitate the smooth flow of information and reduce inventory management costs. Suppliers and customers are crucial members of a supply chain, and as such, manufacturing firms that stand in-between them in the supply chain need to collaborate with these two key actors to generate information that will help them to improve their delivery performance (Doganay & Ergun, 2017). Jum'a et al. (2025) stated that vertical collaboration is highly necessary for manufacturing firms to improve their delivery performance. According to them, when manufacturing firms collaborate vertically with raw material suppliers and customers, they will end up meeting customer growing demand



in a timely and cost-effective manner. Panahifar et al. (2018) opined that vertical collaboration enables manufacturing firms to meet customer needs satisfactorily, as they can leverage on the information generated from customers and suppliers to deliver exceptional performance.

Horizontal Collaboration

Horizontal collaboration occurs when a firm partners with its competitors and non-competitors to execute a project jointly to achieve a shared goal (Cao & Zhang, 2011). Issah et al. (2025) stated that collaboration is said to be horizontal if a firm partners with another firm in the same level of the supply chain to execute a project jointly. For example, a brick manufacturing firm can be said to have engaged in horizontal collaboration if it partners with another manufacturing firm at the same level of the supply chain who happens to be its competitor or non-competitor for shared benefits. Li et al. (2023) opined that manufacturing firms need to embrace horizontal collaboration to improve their delivery performance. According to them, a massive project that would take up to one year can be reduced to a few months to complete if firms in the same level of the supply chain collaborate with each other. When a firm undertakes horizontal collaboration by partnering with its competitors in executing a project, it benefits from shared information and resources (Simatupang & Sridharan, in Nguyen et al., 2022).

Concept of Delivery Performance

Delivery performance refers to the actual result obtained by a firm in terms of making the right quantity and quality of goods available to customers at the scheduled date (Panahifar et al., 2018). It shows how well a firm fulfills customer orders without wasting time and money. Customers expect firms to deliver their order to them in the right condition without any delay. When a firm delivers the right quantity and quality of products to customers in a timely and cost-effective manner, such a firm can be said to have produced an excellent delivery performance and vice versa (Nguyen et al., 2022). Many customers judge the competence of a firm based on its ability to deliver their order on or before the agreed date (Mofokeng & Chinomona, 2019). For this reason, many manufacturing firms are intensifying efforts to improve their delivery performance. Issah et al, (2025) stated that when a firm improves its delivery performance, it will be able to sustain its customer base, generate more sales and increase profitability. Uddin (2022) added that good delivery performance helps a firm to retain its customers and increase their loyalty.

Measures of Delivery Performance

There are several indicators used to measure delivery performance of firms in literature. However, this study measures delivery performance using on-time delivery and cost-effective delivery.

On-Time Delivery

On-time delivery is a term used to describe a scenario whereby a firm makes a customer's order available to him or her on or before the due date as stated in their contractual agreement (Uddin, 2022). Every delivery activity has a due date, which is clearly stated in the contractual agreement between the company (supplier) and the customer who placed an order. When the company delivers the order to the customer on or before the due date, the company can be said to have attained on-time delivery (Cao & Zhang, 2011). Customers generally value timely



delivery of their order because it enables them to execute their business plans effectively without any form of delay (Doganay & Ergun, 2017). When a company delivers customer orders on time, it will make the customer happy and this will increase customer trust on the ability of the company to deliver in future transactions (Jum'a et al., 2025). Baba et al, (2021) posited that on-time delivery is key to customer loyalty and retention. According to them, customers will exhibit a high degree of loyalty if a company keeps its promise by delivering their order on or before the promised date.

Cost-Effective Delivery

Cost-effective delivery is the ability of a firm to deliver the right quantity and quality of goods to customers at a reduced cost (Marhoui & Zeroual, 2025). Companies need to minimize their delivery costs so that they can maximize profit while carrying out their delivery operations. Al-Doorri (2019) stated that cost-effective delivery is very important for companies that are determined to maximize profit and remain in business for a long time. Without cost-effective delivery, it will be difficult for a company to maximize profit and sustain in its industry (Nazifa & Ramachandran, 2019). Therefore, manufacturing firms need to streamline their delivery processes to avoid unnecessary costs and achieve cost-effective delivery. Issah et al, (2025) opined that a firm that is able to achieve cost-effective delivery will have a competitive advantage over its competitors and grow its profit margin.

Theoretical Review

The study is anchored on the resource-based view (RBV) theory, which was developed by Barney in 1991. The theory states that all organizations leverage on their unique resources and capabilities to gain a competitive advantage over their rivals. The resource-based view explains that the possession of strategic resources provides an organization with a golden opportunity to develop a competitive advantage over its rivals (Barney in Edwards, 2017). The theory argues that strategic resources and capabilities allow a firm to enjoy competitive advantage and excellent performance. The resource-based view is useful in explaining how supply chain collaboration strategies can help to improve delivery performance of manufacturing firms. The theory explains how two or more firms in a supply chain can combine their resources, such as knowledge, skills, technology and expertise, to gain a competitive advantage and improve their delivery performance. The internal resources of both firms include their physical, financial, material, human (skills and expertise), and technological resources. When two or more firms combine their resources and capabilities together, they will improve their delivery performance.

Empirical Review

Previous studies have been conducted on supply chain collaboration and performance of firms. For instance, Baba et al, (2021) empirically examined information sharing and supply chain collaboration as strategies for achieving higher performance of firms in Ghana. Their study adopted the descriptive research design where a structured questionnaire was used to collect data from 201 employees of manufacturing firms in Ghana. The data collected were analyzed statistically using mean and standard deviation, while the hypotheses were tested using structural equation modeling (SEM). The findings revealed that firms with higher levels of supply chain collaboration witnessed higher performance than firms with low levels of supply



chain collaboration. The study concluded that supply chain collaboration has a direct and positive influence on firm performance.

Harcourt and Chukwu (2021) carried out a study to determine the relationship between supply chain collaboration and sustainable competitive advantage of energy companies in Rivers State, Nigeria. The researchers adopted the descriptive survey research design and used a structured questionnaire to collect data from 334 managers of energy companies in Rivers State. The data collected were analyzed using descriptive statistics, while the hypotheses were tested using simple regression, stepwise regression, ANOVA and SPSS version 22. The findings revealed that vertical and horizontal collaborations have a strong, positive and significant influence on the sustainable competitive advantage of energy companies in Rivers State.

Nguyen et al, (2022) examined supply chain collaboration and performance of leather and footwear companies in Vietnam. Their study adopted the case study research design and the mixed- method approach where questionnaires and interviews were used to collect data from seven experts in three leather and footwear companies in Vietnam. After analyzing the data collected, the researchers discovered that supply chain collaboration components (information sharing, decision synchronization, goal congruence, joint knowledge creation, incentive alignment, resource sharing, and collaborative communication have significant influence on firm performance in the leather and footwear industry in Vietnam.

Myamba et al, (2024) explored supply chain collaboration dimensions and their influence on the competitiveness of manufacturing firms in Tanzania. The study adopted the positivist research approach and the exploratory and cross-sectional research design. Data were collected from 300 officials of manufacturing firms using a structural questionnaire while the percentage and frequency tables, Partial Least Square and Structural Equation Modeling (PLS-SEM) were used for data analysis. The findings revealed that supply chain collaboration dimensions (customer collaboration and supplier collaboration) have a direct positive influence on the competitiveness of manufacturing firms, while internal collaboration has a complementary partial mediation effect on the relationship between supply chain collaboration and the competitiveness of manufacturing firms.

Ho et al, (2020) empirically examined supply chain collaboration and performance of firms in the textile and garment industry using the maturity model. Their study adopted the case study research design and mixed-methods approach where questionnaires and semi-structured interviews were used to collect data from experts in two textile apparel companies in Vietnam. After analyzing the data using the supply chain collaboration maturity model, the researchers found a positive relationship between supply chain collaboration and performance of firms in the textile and garment industry in Vietnam.

Doganay and Ergun (2017) investigated the effect of supply chain collaboration on supply chain performance in Turkey. Their study adopted the survey research design, where an online questionnaire was used to collect from supply chain managers and purchasing managers of selected industrial organizations registered by Istanbul Chamber of Industry in Turkey. The data collected were analyzed statically while the hypotheses were tested using factory analysis, regression analysis and SPSS version 20. The findings revealed that supply chain collaboration has a positive relationship with supply chain performance in Turkey.



Jum'a et al, (2025) explored supply chain collaboration, innovation, and sustainability performance of manufacturing firms in Jordan. Their study adopted the descriptive research design and the quantitative research approach, where a structured questionnaire was used to collect data from 314 managers of selected manufacturing firms in Jordan. The data collected were analyzed using the Smart Partial Least Square and Structural Equation Modeling (Smart PLS-SEM) software package. The findings revealed that supply chain collaborations (customer collaboration, supplier collaboration and internal collaboration) significantly improve the sustainability performance of manufacturing firms in Jordan. The study also revealed that supply chain innovation has a mediating effect on the relationship between internal collaboration and sustainability performance of manufacturing firms.

From the literature review, it was observed that a good number of studies have been conducted on supply chain collaboration, but none of these studies relate the concept to delivery performance of brick manufacturing firms in Nigeria. Even the dimensions of supply chain collaboration, such as vertical and horizontal collaboration were not related to on-time delivery and cost-effective delivery of brick manufacturing firms in Nigeria. This gap in literature is what this study is motivated to fill.

METHODOLOGY

The positivist research philosophy and the correlational research design were adopted in this study. The population of this study comprised 132 functional brick manufacturing firms that are registered with the Manufacturers Association of Nigeria (MAN) in Southwest Geopolitical Zone. However, 62 brick manufacturing firms were selected purposely for the study based on the criteria that they collaborate with other members of their supply chain. The unit of analysis consisted of strategic managers, tactical managers and operational managers of the 62 selected brick manufacturing firms in Southwest Nigeria. A sample size of 186 managers of the above categories was drawn from the 62 selected brick manufacturing firms in Rivers State at ratio of 3 managers per firm. Data were collected from the respondents using a questionnaire that was structured on a 4-point rating scale ranging from "Strongly Agree" to "Agree" to "Disagree" to "Strongly Disagree". After determining the validity of the instrument using content validity and confirming its reliability using the Cronbach Alpha method, the questionnaire was administered to the respondents (managers) of brick manufacturing firms drawn from the five States that make up the Southwest Geopolitical Zone. A total of 186 copies of the questionnaire were administered to the respondents, and 153 copies were collected. The data collected were analyzed statistically, while the hypotheses were tested using Pearson Product Moment Correlation Coefficient (PPMCC). The analysis was performed with the aid of the SPSS version 24, and the results were interpreted accordingly.



RESULTS AND DISCUSSION

The results of the SPSS correlation analysis carried out on the study variables are presented in the tables below:

Table 1: Result of correlation analysis between vertical collaboration and on-time delivery of bricks manufacturing firms

			Vertical Collaboration	On-Time Delivery
Pearson (r)	Vertical Collaboration	Correlation Coefficient	1.000	.873**
		Sig. (2-tailed)	.	.001
		N	153	153
	On-Time Delivery	Correlation Coefficient	.873**	1.000
		Sig. (2-tailed)	.001	.
		N	153	153

**Correlation is significant at 0.01 levels (2-tailed)

*Correlation is significant at 0.05 levels (2-tailed)

Source: SPSS-Generated Output

Table 1 indicates that vertical collaboration has a very strong and positive correlation with on-time delivery of bricks manufacturing firms ($r = .873^{**}$) and this correlation is statistically significant at 0.01 level. Consequently, the null hypothesis (H_{01}) is rejected and the alternate hypothesis is accepted. This means that we then accept that there is significant relationship between vertical collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria.

Table 2: Result of correlation analysis between vertical collaboration and cost-effective delivery of brick manufacturing firms

			Vertical Collaboration	Cost-Effective Delivery
Pearson (r)	Vertical Collaboration	Correlation Coefficient	1.000	.821**
		Sig. (2- tailed)	.	.001
		N	153	153
	Cost-Effective Delivery	Correlation Coefficient	.821**	1.000
		Sig. (2- tailed)	.001	.
		N	153	153

**Correlation is significant at 0.01 levels (2- tailed)

*Correlation is significant at 0.05 levels (2 -tailed)

Source: SPSS-Generated Output

Table 2 shows a very strong and positive correlation between vertical collaboration and cost-effective delivery of brick manufacturing firms ($r = .821^{**}$) and this correlation is significant at 0.01 level. As a result of this we then reject the null hypothesis (H_{02}) and accept the alternate hypothesis which states that there is significant relationship between vertical collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria.

**Table 3: Result of correlation analysis between horizontal collaboration and on-time delivery of brick manufacturing firms**

			Horizontal Collaboration	On-Time Delivery
Pearson (r)	Horizontal Collaboration	Correlation Coefficient	1.000	.862**
		Sig. (2 -tailed)	.	.001
		N	153	153
	On-Time Delivery	Correlation Coefficient	.862**	1.000
		Sig. (2 tailed)	.001	.
		N	153	153

**Correlation is significant at 0.01 levels (2 -tailed)

*Correlation is significant at 0.05 levels (2- tailed)

Source: SPSS-Generated Output

Table 3 indicates that horizontal collaboration has a very strong and positive correlation with on-time delivery of brick manufacturing firms ($r = .862^{**}$) and this correlation is significant at 0.01 level. Based on this result, the null hypothesis (H_{03}) is rejected and the alternate hypothesis is accepted. This means that there is significant relationship between horizontal collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria.

Table 4: Result of correlation analysis between horizontal collaboration and cost-effective delivery of brick manufacturing firms

			Horizontal Collaboration	Cost-Effective Delivery
Pearson (r)	Horizontal Collaboration	Correlation Coefficient	1.000	.896**
		Sig. (2 -tailed)	.	.001
		N	153	153
	Cost-Effective Delivery	Correlation Coefficient	.896**	1.000
		Sig. (2 -tailed)	.001	.
		N	153	153

**Correlation is significant at 0.01 levels (2 -tailed)

*Correlation is significant at 0.05 levels (2- tailed)

Source: SPSS-Generated Output

Table 4 shows a very strong and positive correlation between horizontal collaboration and cost-effective delivery of bricks manufacturing firms ($r = .896^{**}$) and this correlation is statistically significant at 0.01 level. As a result of this, the null hypothesis (H_{04}) is rejected and the alternate hypothesis is accepted. This means that there is significant relationship between horizontal collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria.



DISCUSSION OF FINDINGS

This study reported a significant relationship between vertical collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria. This finding emerged from the result of the analysis carried out on the two variables. The result revealed that vertical collaboration has a very strong and positive correlation with on-time delivery of brick manufacturing firms ($r = .873^{**}$) and this correlation is statistically significant at 0.01 level. Consequently, the null hypothesis (H_{01}) was rejected and the alternate hypothesis was accepted. This means that there is a significant relationship between vertical collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria. This finding is consistent with the research conducted by Jimenez-Jimenez et al (2019) and Issah et al (2025) as both studies revealed that vertical collaboration enables firms to deliver products in a timely manner.

This study also discovered a significant relationship between vertical collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria. This finding was derived from the result of the analysis carried out on the two variables. The result showed a very strong and positive correlation between vertical collaboration and cost-effective delivery of brick manufacturing firms ($r = .821^{**}$) and this correlation is significant at 0.01 level. As a result of this we then rejected the null hypothesis (H_{02}) and accepted the alternate hypothesis which states that there is a significant relationship between vertical collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria. This finding is supported by Uddin (2022) who revealed that firms that embrace vertical collaboration along their supply chain deliver products in a cost-effective manner. Mofokeng and Chinomona (2019) also supported this finding when they revealed that vertical collaboration enables firms to reduce delivery costs and achieve operational efficiency.

This study found a significant relationship between horizontal collaboration and on-time delivery of brick manufacturing firms in Southwest Nigeria. This finding was deduced from the result of the analysis carried out on the two variables. The result revealed that horizontal collaboration has a very strong and positive correlation with on-time delivery of brick manufacturing firms ($r = .862^{**}$) and this correlation is significant at 0.01 level. Based on this result, the null hypothesis (H_{03}) was rejected and the alternate hypothesis was accepted. This means that there is a significant relationship between horizontal collaboration and on-time delivery of bricks manufacturing firms in Southwest Nigeria. This finding is supported by Kumar et al (2017) and Hofman et al (2020) as both studies revealed that horizontal collaboration enables firms to improve their efficiency and deliver products to their customers on-time.

Finally, it was revealed that horizontal collaboration has a significant relationship with cost-effective delivery of brick manufacturing firms in Southwest Nigeria. This finding emanated from the result of the analysis carried out on the two variables. The result showed a very strong and positive correlation between horizontal collaboration and cost-effective delivery of bricks manufacturing firms ($r = .896^{**}$) and this correlation is statistically significant at 0.01 level. As a result of this, the null hypothesis (H_{04}) was rejected and the alternate hypothesis was accepted. This means that there is a significant relationship between horizontal collaboration and cost-effective delivery of brick manufacturing firms in Southwest Nigeria. This finding is consistent with the research conducted by Cao and Zhang (2011), Panahifar et al (2018), and



Al-Doori (2019) as they revealed that horizontal collaboration enables firms to deliver quality products at a reduced cost.

CONCLUSIONS

This study explored the relationship between supply chain collaboration strategies and delivery performance of brick manufacturing firms in Southwest Nigeria. From the result of the analysis carried out, it was reported that vertical collaboration has a significant relationship with on-time delivery of brick manufacturing firms. The study also found a significant relationship between vertical collaboration and cost-effective delivery of brick manufacturing firms. The study equally reported a significant relationship between horizontal collaboration and on-time delivery of brick manufacturing firms. Horizontal collaboration was also reported to have a significant relationship with cost-effective delivery of brick manufacturing firms. From the findings, it was concluded that supply chain collaboration strategies such as vertical and horizontal collaboration significantly enhance delivery performance of brick manufacturing firms in Southwest Nigeria.

RECOMMENDATIONS

The following recommendations are provided for the study:

1. That, brick manufacturing firms in Nigeria particularly those that are currently experiencing poor delivery performance should adopt collaboration strategies as it would improve their delivery performance.
2. That, brick manufacturing firms in Nigeria should collaborate with members of their supply chain especially on a massive project that they can execute independently as this would boost their capacity to execute the project, grow and take their business to a greater height
3. That, brick manufacturing firms in Nigeria especially those that experiencing constant delay and high delivery costs should adopt vertical collaboration strategy as it would enable them deliver products in a timely and cost-effective manner.
4. That, brick manufacturing firms in Nigeria should collaborate with members of their supply chain in the same level (horizontal collaboration) as it would help them to improve their delivery performance.
5. Finally, it is recommended that brick manufacturing firms that adopt collaboration strategies should be more open and share their ideas, knowledge, expertise and experience with their partners as this would enable them execute their joint project successfully and improve their overall delivery performance.



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