

## **EXTERNAL SUPPLIER INTEGRATION AND OPERATIONAL PERFORMANCE OF SMEs IN RIVERS STATE**

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### **ABSTRACT**

The purpose of this study was to determine the underlying dimensions of external supplier integration and to empirically test a framework identifying the relationships between external supplier integration and operational performance with special emphasis on small and medium enterprises in Rivers State, Nigeria. Data for the study were collected from a sample of 100 respondents selected from 10 categories of SMEs through a stratified random sampling technique within the city of Port-Harcourt in Nigeria. The research framework was tested using Pearson's product moment correlation (PPMC) statistical technique. The results indicate that supplier actors' integration, supplier information integration and supplier technological integration have direct, positive and significant relationship with operational performance. The study recommends amongst others that the management of SMEs should be skilled in packaging supplier actors' integration and supplier technological integration to relate genuinely with operational performance. This is necessary because the study revealed that supplier actor' integration and supplier technological integration were the most significant dimensions of external supplier integration that predicts operational performance.

**Keywords:** External supplier integration, Operational performance, Small and medium scale enterprises, Nigeria,

**Paper type:** Research paper

## **1. Introduction**

The existing business environment is perceived as highly competitive, dynamic and enormously globalized. To continue to operate in such a business landscape, organizations should embrace the benefits of external supplier integration for competitive advantage. A new business setting emerges out of globalized and intensive world-wide competition, coupled with technological improvement. External supplier integration and strategies are crucially important for the success of SMEs. External supplier integration alludes to practices between companies and their suppliers that facilitate the impressive transfer of knowledge of resources needed for producing mutual advantage (Danese, 2013; Huo, 2012; Childerhouse & Towill, 2011; Danese 2013; Huo, 2012; Childerhouse & Towill, 2011; Danese & Ramano, 2011). This involves long-term linkages with suppliers, facilitating the process of shared problem identification and real time process/product solution (Flynn et al., 2010). Operational performance connotes generally confirmed supply chain performance metrics, involving cost, flexibility and delivery.

The purpose of this study is to determine the underlying dimensions of external supplier integration and to empirically test the framework identifying the relationships between external supplier integration and operational performance with special interest on small and medium scale enterprises in Nigeria. Despite the fact that the requirements and operating setting of SMEs are distinct from those of large firms, there is a dearth of scholarly inquires concerning external supplier integration and operational performance in emerging market economies such as Nigeria. In several emerging countries, SMEs constitute the largest group of manufacturing firms which indispensably supply specialty manufacturing and support services to large firms (Huin et al., 2002). SMEs also play the crucial role of generating employment and economic growth to the economies of emerging countries. Considering the fact that the success of small businesses directly impact on the national economy, this paper seeks to add to the existing body of knowledge by making available new data and empirical discernment into the relationships between external supplier integration and operational performance of SMEs operating in Nigeria. The remnant of the paper is organized as follows. The literature review and hypotheses are presented in section two. The research methodology in section three, result and analysis in section four, and conclusion and implications in chapter five.

## **2. Literature Review and Hypotheses**

The research objective of this study was designed to investigate the relationship between external supplier integration in terms of supplier actors' integration, supplier information integration and supplier technological integration and operational performance. A detailed description of external supplier integration construct along with operational performance is presented in the following subsections. Relying on extant literature the proposed relationship between external supplier integration and operational performance of SMEs are developed.

### **2.1 External Supplier Integration**

External supplier integration connotes the degree to which a manufacturer develops a close relationship and collaborates with its external suppliers to flawlessly contrive the flow of material and information, and improve the value for the advantage of the relationship. The significance of external supplier integration for attaining supply chain

integration is well supported in literature (Schoenherr & Swink, 2012; Zhao et al; 2011, Flynn et al., 2010 Ragatz et al, 1997). For instance, Schoenherr and Swink (2012) gave special attention to the role of supplier integration internalizing resources. Ragatz et al. (1997) revealed that external integration portrayed by suppliers' integration is requisite for manufacturers to attain breakthrough that sustain their competitiveness.

Frohlick and Westbrook (2001), in a seminal work delineating the "arcs of integration, introduced five taxonomies for the manufacturers degree of downstream and upstream integration in the supply chain. Their study demonstrated that the greater the extent of integration with the downstream customers and upstream suppliers, the superior is the performance breakthroughs. Although, some other studies contravened this perspective and revealed that it is not imperative that external supplier is required in the supply chain. For example, Das et al (2006) gave details of such costs as the cost of coordination, compromise and inflexibility linked to integrating with supplier. Cousins and Menguc (2006, p616) contend that regardless of the implicit advantage of supply chain integration, "... it also has costs that may enhance the suppliers operational performance". Flynn et al (2010) finding reveals that external integration did not enhance operational and business performance. The External supplier integration dimensions that were constructed in the theoretical framework from the literature are supplier actors' integration supplier information integration and supplier technological integration.

### **2.1.1 Supplier Actors Integration**

Supplier actors' integration is the extent to which the manufacturers and their major suppliers are maneuvering their relationship closely underpinned on mutual understanding. Zhao et al. (2011) discovered that relationship attachment to both customers and suppliers is consequential to external integration between trading partners. Rosenzweig et al. (2003) detected that the knowledge and expertise achieved from suppliers through close relationship founded on mutual understanding were meaningful for attaining enhancement in design and the all around performance of the supply chain. Kocoglu et al (2011) determined that close relationships with suppliers founded on mutual understanding are all-important for producing high information visibility. Thus, close relationships that emerged overtime founded on mutual understanding bring on capabilities that are arduous to reproduce.

### **2.1.2 Supplier Information Integration**

Supplier information integration is the extent to which the manufacturers and their suppliers share superior information that produce visibility for the relationship. Information sharing with suppliers is material in the supply chain (William et al; 2013). Information visibility emanates from the profound sharing of superior information (Caridi et al, 2014; Williams et al; 2013). Information visibility is inherent for achieving clever inventory control (Saldanha et al, 2013; Mishra et al; 2013).

### **2.1.3 Supplier Technological Integration**

Supplier technological integration is the extent to which the manufacturers linked technologically with their major suppliers via information sharing systems and communication tools that eases information visibility in the relationship.

Integration of information technology cases the flow of information between the firms distinct positions over the supply chain (Kim et al., 2011). Some scholars maintain that the absence of technological integration limits attaining capable information flow and coordination of material flow activities (Saldanha et al; 2013; Kim et al; 2011). Previous empirical studies detected that adopting information sharing systems that supply a real-time means of approach to information furnished operational enhancements in terms of sophisticated information and material flows (Kim et al., 2011; Kocoglu et al; 2011). In essence, technological linkages have the prospect for attaining a competitive advantage due to the high information visibility they beget.

## **2.2 Operational Performance**

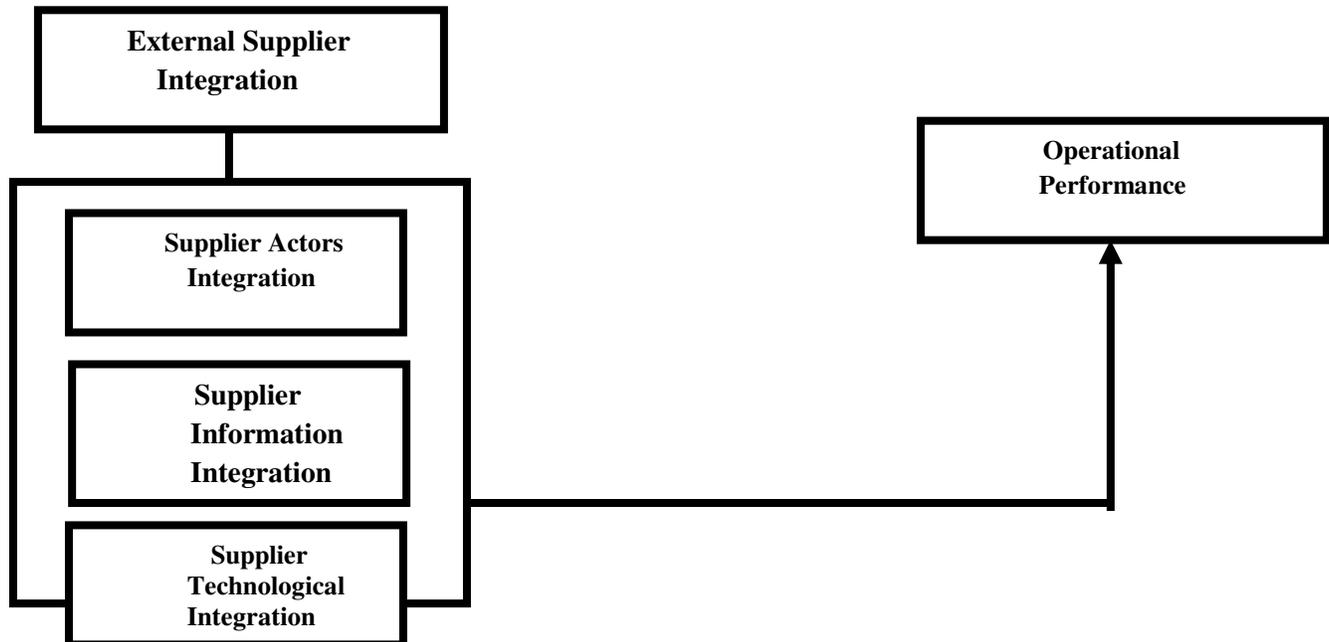
Flynn et al. (2010) allude to operational performance as the approach with which a firm can rapidly alter products to meet customer needs, rapidly launch new products onto the market, respond to variations in demand, improve delivery time, reduce production or move lead time to improve the entire services rendered to the ultimate consumer. Perols et al. (2013) see operational performance as how well a firm accomplishes its market oriented goals and its financial goals. Riggim et al. (2012) referred to operational performance as the current output of a company's measure in anticipation of its inputs, and this measurement permits a company to focus on areas that require enhancement. This present study sees operational performance as the manner in which the innovative process in a company is aligned to improve product and service delivery for the satisfaction of the ultimate consumer.

Camara et al. (2016) found that technological advancement facilitates supply chain process integration, which subsequently produce satisfactory operation performance. This finding is in line with Ireland and Webb (2007) finding that satisfactory operational performance can be attained in chains with partners that are strategically, operationally and technologically integrated. In this study, operational performance is the criterion variable predicted by external supplier integration. This study operationalized operational performance as the level of SMEs performance (increase/decrease) in production and service activities performance.

## **2.3 Previous studies on External Supplier Integration and Operational Performance**

Most studies confirm that higher supplier integration enhances operational performance. For instance, Wong et al (2011) found a significant association between supplier integration and operational performance in terms of delivery and flexibility performance. A study from Droge et al (2012) demonstrates that higher supplier integration enhances delivery performance. prajogo and Olhager (2012) detected a positive relationship amongst strategic long term supplier integration and delivery, flexibility and cost performance. Malhotra and Mackelprang (2012) found that the building of supply chain integration reduces uncertainty and facilitates a more flexible response to supply chain members. Similarly, Huo (2012) determined that supplier integration and customer integration have an internal effect, keenly associated with operational performance than either of the two alone. Along the same line, Flynn et al. (2010) underscores the importance of a manufacturers' integration with both downstream and upstream supply chain partners to improve operational performance. Besides, empirical studies revealed that more impressive supplier integration enhances buyer performance (efficiency and flexibility) Danese (2013) schedule attainment (Zhao et al., 2011) and new

product performance (manufacturing flexibility) (He et al. 2014). It is more likely that external supplier integration can have a more direct and immediate impact on operational performance. Based on the above literature review, research framework can be drawn as follow:



**Figure 1: Proposed research framework**

This study investigates the relationship between external suppliers' integration and operational performance. Based on the figure 1, external suppliers' integration encompasses supplier actors' integration (SAI), suppliers' information integration (SII) and suppliers' technological integration (STI) are significantly related to operational performance. Hence, the following hypotheses:

H1: Supplier actors' integration is positively related to operational performance.

H3: Supplier information integration is positively related to operational performance.

H3: Supplier technological integration is positively related to operational performance.

### **3. Research Methodology**

This study adopted the number of employee as the platform for the definition of SMEs as one that employs fewer than 250 Staff. The sample frame includes employees 10 categories of SMEs selected through the stratified random sampling technique within the city of Port Harcourt in Nigeria. The selected SMEs categories fell under the following: Agriculture and agro-allied, Banking and Finance, Computer and ICT, Food and Beverages, Health and Medical,

Manufacturing and Production, News, Advertising and Media, Professional Services Shopping and Specialty, and Sports and Recreation. The researchers determined the sample size of 100 with the use of the formula developed by Cochran (as cited in Singh & Masuku, 2014). Samples are ten divided in such a manner that units of the 10 eclectic strata are portrayed having being giving unbiased chance to be chosen. Finally, the respondents were randomly handpicked. A survey instrument was developed to investigate the relationship between external supplier integration and operational performance of SMEs. The questionnaire was severally pre-tested to ensure that the questions were appropriate. The respondents were asked to indicate on a Likert scale of 1 (strongly disagree) to 5 (strongly agree) on the extent of the relationship between external supplier integration and operational management. Cronbach, s coefficient alpha was used to assess the reliability of each scale. Alpha values over 0.7 were recorded for each of the item scale. Thus, all scales were considered reliable (Nunally.1978).

**4. Results and Discussion**

**4.1 Correlation Analysis**

**4.1.1: Relationship between Supplier Actors’ Integration and Operational Performance**

**Table 1: Correlation analysis showing the strength and direction of relationship between Supplier actors’ integration and operational performance**

	Supplier Actors’ Integration	Operational Performance
Supplier Actors’ Integration	1	.636
Sig. (2-tailed)		.000
N	100	100
Operational Performance	Pearson’s correlation .636	1
Sig. (2-tailed)	.000	
N	100	100

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

**Source: SPSS window output, 2020**

The correlation analysis as shown in Table 1 indicates that the correlation coefficient ( $r$ ) = .636. This implies that strong relationship exists between Supplier Actors' Integration and Operational Performance. The direction of the relationship as indicated by the sign of the correlation coefficient is direct; indicating that when mutual understanding between manufacturers and their suppliers increases, operational performance of the supply chain also increases. This agrees with the stated hypothesis 1 that supplier actors' integration is positively related to operational performance. The significant/probability value ( $PV$ ) =  $0.000 < 0.05$ , therefore, the researchers conclude that a significant positive relationship exists between supplier actors' integration and operational performance, implying that supplier actors' integration has a positive relationship with the mutual understanding between manufacturers and their suppliers, this induces and all-round performance in the supply chain which leads to operational performance.

**4.1, 2: Relationship between Supplier Information Integration and Operational Performance**

**Table 2: Correlation analysis showing the strength and direction of relationship between Supplier information integration and operational performance**

	Supplier Information Integration	Operational Performance
<b>Supplier Information</b>		
Integration	1	.452
Sig. (2-tailed)		.000
N	100	100
<b>Operational</b>		
Performance	Pearson's correlation .452	1
Sig. (2-tailed)	.000	
N	100	100

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

Source: SPSS window output, 2020

The correlation analysis as shown in Table 2 indicates that the correlation coefficient (r) = .452. This implies that a moderate relationship exists between Supplier Information Integration and Operational Performance. The direction of the relationship as indicated by the sign of the correlation coefficient is direct; indicating that when information integration between a manufacturer and its suppliers increases, operational performance of the supply chain also increases. This agrees with the stated hypothesis 2 that supplier information integration is positively related to operational performance. The significant/probability value (PV) = 0.000 < 0.05, therefore, the researchers conclude that a significant positive relationship exists between supplier information integration and operational performance, implying that supplier information integration has a positive relationship with the information sharing system between the manufacturers and their suppliers thus, its operational performance.

**4.1.3: Relationship between Supplier Technological Integration and Operational Performance**

**Table 3: Correlation analysis showing the strength and direction of relationship between Supplier Technological integration and operational performance**

	Supplier Technological Integration	Operational Performance
Supplier Technological Integration	1	.586
Sig. (2-tailed)		.000
N	100	100
Operational Performance	Pearson's correlation .586	1
Sig. (2-tailed)	.000	
N	100	100

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

**Source: SPSS window output, 2020**

The correlation analysis as shown in Table 3 indicates that the correlation coefficient (r) =.586. This implies that a moderate relationship exists between Supplier Technological Integration and Operational Performance. The direction of the relationship as indicated by the sign of the correlation coefficient is direct; indicating that when the technological

linkage between manufacturers and their suppliers though information sharing increases, operational performance of the supply chain also increases. This agrees with the stated hypothesis 3 that supplier technological integration is positively related to operational performance. The significant/probability value (PV) = 0.000 < 0.05, therefore, the researchers conclude that a significant positive relationship exists between supplier technological integration and operational performance, implying that supplier technological integration has a positive relationship with sophisticated information and material flows that improve operational performance.

The result of the test on the first hypothesis revealed a positive and significant relationship between supplier actor,s integration and operational performance. From our findings, we understand that when supplier actors' integration is positively handled, it rubs on positively on operational performance. Our findings agree and support the findings of Wong etal.(2011), who found a significant association between supplier integration and operational performance. The second hypothesis also found a positive and significant relationship between supplier information integration and operational performance. Supplier information integration is necessary for availability of superior information that leads to visibility for the relationship in a supply chain. Our finding and assertion is in line with the findings of Saldanha etal. (2013) and Mishra etal, (2013) who revealed a relationship .between information visibility and achieving efficient inventory control. Besides, the third hypothesis detected a positive and significant relationship between supplier technological integration and operational performance. This implies that the presence of supplier technological integration will produce operational improvements that in term of better information and material efficiency. Our findings support the findings of Droge etal. (2012) who demonstrated that higher supplier integration enhances delivery performance. It is possible to argue external supplier integration it can lead to a favourable impact that elicits competitive advantage that will result to operational performance.

## **5. Conclusion and Implications**

It is evident from the findings that there is implicit relationship between attributes of external supplier integration and operational performance. The paper has provided empirical justification that identified three dimensions of external supplier integration and describes the relationships between external supplier integration and operational performance within the context of SMEs. The results of the quantitative analysis demonstrate that, there is a sufficient evidence to show that external supplier activities adopted by SMEs relates with operational performance. The H<sub>1</sub>, H<sub>2</sub>, and H<sub>3</sub> were all statistically measured and supported, indicating that external supplier integration significantly and positively affects operational performance.

This study presents three implications. First, by developing and validating a workable research framework of external supplier integration and operational performance, and by depicting its usefulness in enhancing operational performance of SMEs, it provides supply SCM managers with an important tool for measuring the efficiency of their existing external supplier integration activities. Second, through the analysis of the association between external supplier integration and operational performance, there is the indication that external supplier integration might directly impact on operational performance. Third, the findings of this study are in line with the view that the implementation of external supplier integration activities has a significant influence on operational performance.

## **6. Recommendations**

Based on the findings of the study, we suggest that the management of SMEs should be skilled in packaging supplier actors' integration and supplier technological integration to relate genuinely with operational performance. This is necessary because the study revealed that supplier actor' integration and supplier technological integration were the most significant dimensions of external supplier integration that predicts operational performance.

Management of SMEs should key in to the three dimensions of external supplier integration (supplier actors' integration, supplier information integration and supplier technological integration) to operational performance, since the study unveiled a statistically significant relationship between them.

## **7. Limitation of the Study**

The major limitation of our study was the restricted focus of Nigerian SMEs and the use of 100 respondents from 10 categories of SMEs. This will make the generalization of our findings to other emerging countries and other sectors impossible. As shown in the research design, the research contextual population was defined to 10 SMEs in Rivers State from which the findings and conclusions were drawn. It is utterly realizable that there may be significant differences in the findings, if this study is replicated using a greater number of SMEs in Rivers State.

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