

INFORMATION SHARING AND OPERATIONAL EFFICIENCY OF OIL AND GAS SERVICES PROVIDERS IN RIVERS STATE

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Abstract

This study explored the correlation between information sharing and operational efficiency of oil and gas service providers in Rivers State, focusing on how information sharing relates to cost reduction, time saving and service delivery. Founded on the Resource-Based View, the study adopted a correlational research design with a cross-sectional approach. The population of the study comprised 33 oil and gas services providers. All the companies were surveyed. However, 131 respondents provided data for the study through a semi-structured questionnaire consisting of 16 measurement items, and designed in Likert 5-point scale. The Pearson Product Moment Correlation served as test statistic. The results of test of hypotheses revealed that information sharing relates positively and significantly to cost reduction, time saving and service delivery. Thus, the study concludes that information sharing is pivotal to operational efficiency of oil and gas service providers in Rivers State, and recommends that, oil and gas service providers in Rivers State that seek improved operational efficiency should engage information with key stakeholders in their supply chain.

Keywords: Cost reduction, information sharing, operational efficiency, time savings, service delivery.

Introduction

Information sharing has emerged as a cornerstone of collaboration among service providers in today's competitive and dynamic oil and gas industry (Zhou & Benton, 2007). Among oil and gas service providers whose operations involve complex logistics, asset management and safety-sensitive procedures, the ability to share information efficiently determines overall responsiveness, cost control and service quality of firms (Wamba et al., 2020). Effective information flow supports predictive maintenance, faster turnaround times and coordinated supply chain actions, all of which contribute to higher operational efficiency (Gunasekaran et al., 2017).

Despite its strategic importance, information sharing remains a significant challenge among oil and gas service providers in Rivers State. Many service providers still rely on fragmented communication channels, manual data exchange and paper-based reporting systems that hinder coordination and real-time decision-making (Okoli & Amadi, 2021). The absence of integrated information systems often leads to production delays, duplicated efforts, inventory discrepancies, and poor responsiveness to client demands. Consequently, inefficiencies persist in scheduling, maintenance, and logistics operations, reducing competitiveness in a sector already constrained by fluctuating oil prices, infrastructure deficits, and stringent regulatory requirements (Obi & Nwafor, 2022).

Empirical studies in Nigeria has largely focused on supply chain collaboration, digitalization, and performance in manufacturing and logistics sectors, with limited attention given to how information sharing specifically influences operational efficiency in oil and gas service firms (Ogunbiyi & Adewunmi, 2020). This underscores the need for context-specific analysis of the relevance of information sharing to operational efficiency in terms of cost reduction, time saving, and service delivery.

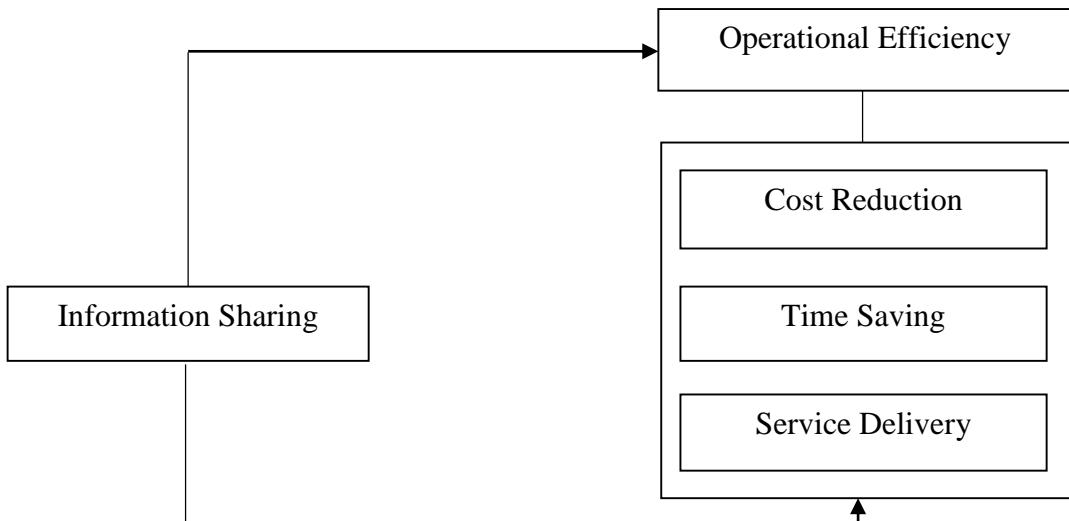


Fig. 1: Conceptual framework of relationship between information sharing and operational efficiency of oil and gas service providers in Rivers State

Theoretical Framework

Resource-Based View (RBV) is a foundational theory in strategic management that emphasizes internal resources and capabilities of a firm as primary sources of sustainable competitive advantage (Barney, 1991). It posits that organizations differ in their bundles of tangible and intangible resources, and that these differences account for variations in performance (Wernerfelt, 1984). According to RBV, for a resource to contribute to superior performance, it must possess four critical attributes: it must be valuable, rare, inimitable, and non-substitutable - often referred to as the VRIN criteria (Barney, 1991). When firms effectively develop, combine, and deploy such resources, they create unique competencies that competitors find difficult to replicate, thereby achieving operational superiority.

In modern organizations, information and knowledge are increasingly recognized as strategic resources. Within the RBV framework, information sharing constitutes an intangible capability that enhances coordination, learning and decision-making across organizational and inter-organizational boundaries (Grant, 1996). For oil and gas service providers, information sharing facilitate real-time communication among departments, suppliers and customers, thereby improving operational efficiency through reduced delays, accurate scheduling and optimized asset utilization. This aligns with the assertion that firms gain advantage not merely from physical assets but from the effective use and integration of knowledge-based resources (Peteraf & Bergen, 2003).

In the context of Rivers State's oil and gas sector, where the operational environment is characterized by volatility, infrastructure challenges and regulatory complexity, the ability to share and utilize information effectively becomes a vital strategic capability. Many service providers struggle with fragmented information systems, poor data integration, and limited digital infrastructure, which undermine operational efficiency and responsiveness (Okoli & Amadi, 2021).

The relevance of RBV to this study lies in its explanatory power: it provides a theoretical foundation for understanding how internal capabilities, particularly information sharing, can be leveraged to improve operational efficiency. It also offers a lens for assessing how oil and gas

service firms in Rivers State can transform information management practices into distinctive competencies that yield sustainable operational advantages.

Concept of Information Sharing

Information sharing involve cooperative use of information by collaborating firms (Okwong et al., 2025). It is the systematic exchange of relevant data, knowledge and insights among stakeholders to support operational processes, strategic planning, and performance improvement (Zhou & Benton, 2007). Information sharing is a critical element of modern organizational management and an essential enabler of collaboration, coordination and decision-making across functional and inter-organizational boundaries. In an increasingly dynamic and competitive business environment, the ability of firms to share timely, accurate and relevant information determines their adaptability, responsiveness and overall efficiency (Li & Lin, 2006).

Information sharing enhances transparency and trust, and allow firms to reduce uncertainty and mitigate risks in operational processes. According to Lee and Whang (2000), when organizations exchange critical information such as inventory levels, demand forecasts and production schedules, they can synchronize their operations more effectively, reduce redundancies, and respond more quickly to market fluctuations. This exchange fosters a culture of cooperation and interdependence that strengthen relationship among supply chain partners and improve collective performance.

The growing digitization of business operations further amplify the strategic importance of information sharing. Technologies such as cloud computing, enterprise resource planning (ERP) systems and data analytics enable real-time data exchange, facilitating informed decision-making and seamless coordination across geographically dispersed operations (Sanders & Premus, 2002).

However, effective information sharing is often constrained by factors such as lack of trust, data silos, inadequate technological infrastructure, and fear of information misuse (Moberg et al., 2002). Overcoming these barriers requires establishing strong communication channels, clear data governance policies and a culture of openness and collaboration. When successfully implemented, information sharing becomes a strategic capability that drive operational efficiency, innovation and sustainable competitiveness.

Concept of Operational Efficiency

According to Ateke et al. (2025), optimal use of resources to achieve “best possible outcomes” is the pristine preoccupation efficiency. In business, efficiency represent favourable outcome of assessment between input employed and output obtained; and is demonstrated in a firm’s ability to generate maximum outputs with minimal resources (Ateke et al., 2025). Thus, operational efficiency is the ability of a firm to deliver goods and services to customers in the most cost-effective manner possible, while maintaining high quality, productivity and responsiveness (Slack et al., 2016). Efficient operations enable firms to optimize resource utilization, streamline workflows, and enhance customer satisfaction, thereby, attain superior performance (Heizer et al., 2020).

At its core, operational efficiency is driven by process improvement. Also, automation and digital integration have been noticed to enhance operational visibility that allow real-time monitoring and faster decision-making (Porter & Heppelmann, 2015). In highly competitive industries, operational efficiency require firms to control costs, maintain equipment reliability, and ensure timely service delivery. Inefficiencies often result in downtime, resource wastage, and financial

losses (Agyapong et al., 2020). Therefore, achieving operational efficiency is not merely a technical or managerial goal but a strategic imperative for long-term sustainability.

Operational efficiency is a concept with several dimensions. It is often decomposed into cost, order-cycle time and waste reduction, as well as optimal resource utilization and energy conservation (Nwulu et al., 2022). However, this study adopted cost reduction, time saving and service delivery as dimensions of operational efficiency.

Cost reduction

Cost reduction is a process aimed at lowering overall cost of operations without compromising quality or customer satisfaction. It involves systematic identification and elimination of waste to enhance competitiveness and profitability (Drury, 2018). Unlike cost cutting, which often entail short-term or reactive expense reduction, cost reduction emphasizes sustainable improvement in productivity, process optimization and value creation (Porter, 1985).

At its core, cost reduction seeks to optimize resource utilization. Through approaches like lean management, process reengineering, automation and efficient supply chain coordination, firms can significantly minimize waste and operational delays (Womack & Jones, 2003). Lean principles, for example, promote elimination of non-value-adding activities and enhancement of workflows, leading to reduced production and service costs.

Cost reduction contribute to better financial management and long-term competitiveness. Firms that consistently evaluate and adjust their cost structures can allocate resources strategically, withstand market volatility, and improve shareholder value (Horngren et al., 2012). However, cost reduction requires employee involvement and a culture of continuous improvement. Kotler and Keller (2016) note that engaging staff in identifying inefficiencies foster innovation and ownership, ensuring that cost-saving initiatives are sustainable.

Time saving

Time saving is a critical dimension of operational efficiency across industries. It refers to reduction in the amount of time required to complete a specific process, task or service delivery cycle without compromising quality (Slack et al., 2016). In contemporary business environments characterized by intense competition and rapid technological advancement, organizations increasingly prioritize time-saving strategies as a means of enhancing responsiveness, cost control and customer satisfaction. The principle is rooted in operations management and lean philosophy, which emphasize eliminating non-value-adding activities and process delays (Womack & Jones, 2003).

Time saving directly influence overall organizational performance by enabling faster throughput, shorter lead time, and improved capacity utilization. Organizations that optimize process flow and reduce waiting time experience significant gains in productivity and customer retention (Stevenson, 2020). In manufacturing, logistics and service sectors, digital technologies have revolutionized time efficiency by streamlining operations and reducing human intervention (Brynjolfsson & McAfee, 2014). These innovations minimize downtime, accelerate decision-making, and promote agility in responding to market changes.

In the context of supply chain and operations, time saving translate to competitive advantage through faster order fulfillment and reduced inventory holding periods. Chopra and Meindl (2019) argue that time efficiency enhances coordination among supply chain partners, lowers transaction costs, and improves service reliability. For industries like oil and gas, where delays can result in

significant financial losses and safety risks, time saving is essential to sustained operational excellence.

Service delivery

Service delivery is the systematic process through which organizations provide goods or services to meet customer needs, expectation and satisfaction. It encompasses activities, interactions and systems involved in ensuring that services are effectively designed, implemented and evaluated to achieve quality outcomes (Parasuraman et al., 1988). Effective service delivery is therefore a vital determinant of organizational performance, particularly in industries where customer experience, timeliness and reliability define competitive advantage.

Fundamental principles of service delivery include responsiveness, assurance, reliability, empathy, and tangibility. These dimensions shape how customers perceive quality of service delivery and their level of satisfaction. In public and private sectors alike, service delivery effectiveness depends on clear communication, resource adequacy, competent personnel and continuous process improvement (Kotler & Keller, 2016). Organizations that prioritize these factors often achieve higher customer loyalty, reduced service failures and improved operational efficiency (Amah & Nwuche, 2013).

Ultimately, effective service delivery requires a customer-centric culture supported by efficient processes and capable personnel. It serves as a bridge between organizational strategy and customer satisfaction, linking internal efficiency to external value creation. By integrating technology, human capability, and quality management, organizations can ensure that service delivery not only meets expectations but also fosters trust, loyalty, and sustainable growth.

Information Sharing and Operational Efficiency

Empirical studies across industries consistently show that information sharing enhances cost reduction, time efficiency and overall operational performance. Li and Wang (2019) examined the impact of information sharing on cost reduction among 300 manufacturing firms in China's industrial hubs; and found a significant positive relationship between information sharing and supply chain cost efficiency, demonstrating that timely access to information optimizes decision-making and resource use.

Similarly, Sanders and Ganeshan (2020) conducted a mixed-method study in the United States, involving over 500 supply chain professionals from 50 retail firms. Their findings indicated that retailers with advanced supplier information-sharing systems achieved up to 18% reduction in procurement costs through improved order synchronization and bulk purchasing. This revelation establishes that real-time information sharing is a strategic enabler of cost reduction, particularly in high-volume and time-sensitive industries.

In Okwong et al. (2025), it was observed that information sharing enable fast moving consumer goods distributors achieve stronger market presence; while Jessica and Leslie (2009), reported that effective information sharing improve operational outcomes of firms by promoting better communication and reducing redundant efforts. These results emphasize that exchanging both shared and unique information enable firms achieve greater efficiency and superior market performance.

Also, Daisy and Reuben (2020) explored information sharing and service delivery at Oxfam International, Kenya; and revealed that quality, level and mode of communication significantly improve service coordination and reduced operational delays. Furthermore Henttonen et al.

(2016) examined public organizations and discovered that employees who actively shared information performed better in their roles.

Collectively, these studies affirm that information sharing enhance operational efficiency by improving coordination, decision-making and workflow integration across sectors. Thus, the following hypotheses were formulated to guide the study:

H_01 : There is no significant relationship between information sharing and cost reduction of oil and gas service providers in Rivers State.

H_02 : There is no significant relationship between information sharing and service delivery of oil and gas service providers in Rivers State.

H_03 : There is no significant relationship between information sharing and Time savings of oil and gas service providers in Rivers State.

Methodology

This study adopted correlational research design with a cross-sectional approach. The population of the study comprised 33 oil and gas service providers in Rivers State. All the companies were studied because the population is small. However, 131 respondents comprising (i) supply chain managers (ii) operations managers (iii) procurement officers (iv) logistics managers and (v) marketing managers provided data for the study through a semi-structured questionnaire consisting of 16 measurement items, and designed in Likert 5-point Liker scale. To determine the reliability of the research instrument, a pilot study (pretest) was conducted and the data were subjected to Cronbach's Alpha reliability test with a threshold of 0.70 set by Nunally (1978). Furthermore, the construct validity of the instrument was determined through Exploratory Factor Analysis (EFA). See Table 1 for results of reliability and validity tests. To establish the correlation between information sharing and indices of operational efficiency, Pearson Product Moment Correlation (PPMC) analysis was used to test 3 hypotheses at a critical value of 0.05. The analysis was done with the aid of Statistical Package for Social Sciences (SPSS) version 25.

Table 1: Results of Reliability and Validity Tests

S/N	Variables	Number of Items	Cronbach's Alpha Coefficients	Factor Loadings
1	Information Sharing	4	0.751	0.623
2	Cost Reduction	4	0.877	0.916
3	Service Delivery	4	0.731	0.877
4	Time Savings	4	0.747	0.833

Source: SPSS Output form field data (2025)

Results of the Cronbach's alpha analysis in Table 1 revealed that all the variables in the study produced high Cronbach's Alpha coefficients. This is evidence that, there is inter-item consistency among the variables in the study. In other words, if this study is conducted again in a similar condition the results will be similar to the results of this study. Again, all the variables have high factor loadings greater than 0.4, indicating that the items and variables in the questionnaire measured what they were supposed to measure. These loadings indicated that there is no cross-loading hence there is discriminant validity.

Table 2: Correlation between Information Sharing and Cost Reduction

		Information Sharing	Cost Reduction
Information Sharing	Pearson Correlation	1	.691 **
	Sig. (2-tailed)		.000
	N	131	131
Cost Reduction	Pearson Correlation	.691 **	1
	Sig. (2-tailed)	.000	
	N	131	131

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

Source: SPSS Output form field data (2025)

Pearson correlation analysis was conducted to assess the link between information sharing and cost reduction of oil and gas service providers in Rivers State. Using a sample of 131 respondents, drawn from 33 oil and gas service providers in Rivers State, the result of the analysis in Table 2 shows that information sharing has a strong, positive and statistically significant correlation with cost reduction of oil and gas service providers in Rivers State. This result is evident in the correlation coefficients of 0.691 and probability value of $0.000 < 0.05$. In view of this result, the null hypothesis was rejected.

Table 3: Correlation between Information Sharing and Time Saving

		Information Sharing	Time Savings
Information Sharing	Pearson Correlation	1	.798 **
	Sig. (2-tailed)		.001
	N	131	131
Time Savings	Pearson Correlation	.798 **	1
	Sig. (2-tailed)	.001	
	N	131	131

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

Source: SPSS Output form field data (2025)

Pearson correlation analysis was conducted to assess the connection between information sharing and time savings of oil and gas service providers in Rivers State. Using a sample of 131 respondents, drawn from 33 oil and gas service providers, the analysis revealed - as shown in Table 3 that, information sharing has strong, positive and significant correlation with time saving of oil and gas service providers in Rivers State. This result is evident in the correlation coefficients of 0.798 and a probability value of $0.000 < 0.05$. Thus, the null hypothesis was rejected.

Table 4: Correlation between Information Sharing and Service Delivery

		Information Sharing	Service Delivery
Information Sharing	Pearson Correlation	1	.567 **
	Sig. (2-tailed)		.009
	N	131	131
Service Delivery	Pearson Correlation	.567 **	1
	Sig. (2-tailed)	.009	
	N	131	131

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

Source: SPSS Output form field data (2025)

Table 4 shows that results of Pearson correlation analysis on association between information sharing and service delivery of oil and gas service providers in Rivers State. The analyses was based on a sample of 131 respondents, drawn from 33 oil and gas Service Providers. The test produced a correlation coefficients of 0.567 and a probability value of $0.000 < 0.05$. These facts imply that information sharing has moderate, positive and significant correlation with service delivery of oil and gas service providers in Rivers State. Thus, the null hypothesis was rejected.

Discussion of Findings

This study examined the correlation between information sharing and operational efficiency of oil and gas service providers in Rivers State. The empirical analyses conducted in the study, revealed that information sharing has strong positive correlation with cost reduction, strong positive and correlation with time saving and moderate positive correlation with service delivery of oil and gas service providers in Rivers State. In addition, the results showed that all the correlation were statistically significant.

These findings align with findings of previous studies. The findings agree with the findings of Li and Wan (2019) that real-time data exchange between suppliers and manufacturers led to a 12% reduction in lead time and minimized excess inventory holding costs. The current findings also support those of Sanders and Ganeshan, (2020) that retailers with advanced supplier information-sharing platforms reduced procurement costs by 18% through bulk purchasing and optimized order cycles

In addition, the current findings align with the findings of Jessica and Leslie (2009) that teams engaging in effective information sharing exhibit improved operational outcomes, emphasizing that balanced communication, where both shared and unique information are discussed, leads to better decision-making and efficiency. Furthermore, the findings of this study confirm the results of Henttonen et al. (2016) that individuals who actively share information within their organization tend to perform better in their roles; and that of Daisy and Reuben (2020) that effective information sharing, including quality, level, and mode of communication, significantly improved service delivery by increasing coordination and reducing delays.

Conclusion and Recommendations

Based on the findings of this study, it is concluded that there is a positive and significant relationship between information sharing and operational efficiency of oil and gas service providers in Rivers State. The study highlights that effective information sharing fosters transparency and responsiveness, enabling partners to make timely and informed decisions that reduce waste, eliminate redundancies, and improve service levels.

Based on the findings and conclusion of this study, it is recommended that, oil and gas service providers should invest in advanced information and communication technologies that enable real-time data exchange with supply chain partners. Accurate and timely sharing of information such as demand forecasts, inventory levels, project schedules, and operational disruptions can significantly reduce uncertainty, enhance coordination, and improve responsiveness. The companies should also establish protocols and data governance policies to ensure data quality, security, and confidentiality.

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