



# Production Improvement Function and Operational Performance of Nigerian Refineries

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**ABSTRACT**

This study seeks to confirm the relationship that exists between Production Improvement Function (PIF) Quality of Service (QOS), and Quality of Delivery (QOD), in Nigerian refineries. One hundred and twenty-four respondents from four refineries constituted the sample size, and data was collected through research questionnaires through a research questionnaire. The data was analyzed using structural equation modeling (SEM). The results show that there is a high positive correlation between production improvement functionality and both quality of service ( $\beta = 0.724, p = 0.000$ ) and quality of deliveries ( $\beta = 0.652, p = 0.000$ ). Nevertheless, more research into the causal channels that resolve into continuous refinement of service quality needs to be performed. Recommended strategies for implementation and further development include collectivized progress schemes, investment in the latest technology, systematic employee training, and effective chain management. Applying these recommendations is very important (fighting for) operational efficiency, service quality, and customer satisfaction in Nigerian refineries in the long term with long-term success and competitiveness in the market.

**Keywords:**

Production Improvement Function (PIF) Quality of Service (QOS), and Quality of Delivery (QOD), and Operational Performance

**Introduction**

The Nigerian refineries' oil processing success is a critical barometer testing the country's economic health and energy security. Through the in-depth exploration of the production enhancement features of Nigeria's oil refineries, we are not only going to search the ways of improving the efficiency of their works and turning it more profitable, but also will be able to rethink the country's policy on energy changes in response to global trends and local needs (Olujobi et al., 2022). The role of Nigerian refineries in the country's economy is the refining of crude oil into petroleum products for domestic use and export which contributes to revenue generation and the nation's economic

prosperity. Running the refinery operation well provides a stable supply of petroleum products, which reduces the amount of imports and energy dependence. Effective refineries provide employment, which helps to create job opportunities and causes a poverty reduction. Enhanced efficiency in operations will minimize the imported requirement for refined petroleum products and result in saving foreign exchange, hence building the currency (Ojo & Adebuseyi, 1996; Okoro et al., 2017; Omoriegbe, 2019). Bebetidoh et al. (2020) submitted that a saturated upstream refining business also guarantees the upsurge of downstream industries, thereby making industrialization and diversification a reality. The use of modern

technologies in refining can alleviate environmental risks posed by such activities thus promoting sustainability as well conservation of the environment. Refineries, though being a productive part of the whole infrastructural development, are mainly beneficial in terms of transportation, logistics, and ancillary services. Likewise, taxes and other revenues from the operation of refineries go to the government.

The production improvement function is demanding for Nigerian refineries because it produces efficiency, productivity, and quality in refining processes. The primary purpose of this lean approach is to maximize efficiency through optimal processes, avoid downtime, and reduce waste. This balances output with minimal costs. Utilization of process control systems may bring considerable improvement in operational efficiencies and yield cards (Okolocha & Anugwu, 2022). Production improvement projects are focused on flowing process improvement, bottlenecks elimination, and resource utilization increase, thus generating higher production volumes. Constant equipment and machinery maintenance and overhauling can eliminate unplanned failures and enhance overall efficiency (Hardt et al., 2021). Besides that, it is also important to monitor quality control and assurance that meets regulatory requirements and provides satisfaction to the customers. Technology and upgrading are the main elements of the production improvement function of Nigerian refineries that help them to be competitive and to cope with changing demand. Investment in cutting-edge refinery technology that will lead to an increase in the output and quality of petroleum products will improve the market price (Umukoro, 2018). Also, risk mitigation is the other important part of the production improvement function. It identifies and handles existing operational risks in such a way as to reduce the probability of accidents, spills, and other incidents that may shut down, interrupt, and impact the safety and environmental performance of the facility. Through the implementation of strict safety protocols, regular audits, and training programs, the

integrity of the working area will be guaranteed for employees.

### **Theoretical Foundation**

The Resource Based View (RBV) theory which was propounded by Jay Barney in 1991, holds the view that most of the firm's competitiveness stems from the firm's internal resources and capabilities rather than factors in the external environment. The theory postulates these preconditions: resource heterogeneity, resource immobility, and VRIO (value rarity inimitability and organization). Should be valued, rare, inimitable, and strategically applied within an organization so that supported competitive advantage is ensured. The steps of the development and transformation of Russian companies which are believed to contribute to the production enhancement of Nigerian oil refineries are considered in the light of RBV (Kozlenkova et al., 2014). With their cost effectiveness, product stability, and quality, refineries can have a competitive advantage over internally recognized and exploited resources and capabilities including technological know-how, an able labour force, and smooth operations. Further, the enhancement of specific workforce training programs, investments in modern refining tools, and optimization of production processes can all be tools for the enhancement of refinery performance. As a result, this can lead to the improvement of the operational performance of a company and a stronger position in the industry in comparison to other competitors. On the one hand, the RBV highlights the importance of continually adding and shielding valuable internal resources for the company to come back with a competitive advantage for a long period (Connor, 2002; Kozlenkova et al., 2014). This brings into focus the long-term strategic implications for the production capacity expansion of the Nigerian refineries.

### **Production Improvement Function**

In a broader sense, production can be viewed not only as a process of manufacturing products but also as the transformation of energy and material into goods and services intended to satisfy the needs of people (Ongbali, Afolalu & Igboanugo, 2018). As noted by Ikumapayi,

Akinlabi, Madushele, and Fatoba (2020), manufacturing is frequently referred to as the process of turning raw materials into fully produced goods and services. One way to write about production is to talk about how a business makes inputs into an output. Therefore, human wants are satisfied through the process whereby commodities and services are produced using inputs or the production factors (Freeze, et al., 2018). Continually modifying the goods, services, or procedures is called a (Mudhafar, Mohammed, & Constantinos, 2020). Production capacity dynamics allow for assessing the tool wear, forecasting the replacement of such tools, technology, and production planning (Omhonria and Needorn, 2022). The primary tasks of the production improvement function comprise reducing the lead times, enhancing flexibility, improving quality, lowering costs, and raising productivity. Chen, Yan, Tai, and Chang (2017) state that these benefits include higher profitability, superiority in the market, customer satisfaction, a smaller environmental impact on the environment, and involvement and morale of the staff. An industrial engineering and management strategy in which the production improvement function (PIF) is focused on achieving an enhanced rate and a better production level. It includes purpose, inlet, process, outlet, and all activities (Umoh & Wokocha, 2013). Imposing lean manufacturing standards, making technologically based and automated investments, streamlining production schedules, establishing quality control mechanisms, and delivering training to staff are a few examples of actions related to the production improvement duty (Poth et al., 2019). The type of PIF that will be selected will depend on the business's demands and objectives, and efficiency in the future requires continuous improvement. Collaboration in all departments of the organization you want to influence is needed for good PIF. The type of PIF that is to be used depends on the objectives and needs of the given organization (Mangesti Rahayu, 2019).

### **Operational Performance**

An organization's function is referred to as its performance. Since performance is seen as one

of the most important measures of an organization's success, managers and staff work tirelessly to enhance it. Operational performance sets a standard by which the procedures of the company are connected to performance through observable and quantifiable characteristics (Job, Njihia, Maalu & Iraki, 2021). Eshikumo and Odock (2017) define operational performance as the extent to which the production and distribution of goods and services meet quality, speed, reliability, flexibility, and cost requirements at any given time. The following benefits are linked to operational performance: reduced work costs, increased profitability, improved partner execution understanding, increased office throughput, amplified limit and enhanced administration levels, decreased client administration complaints, decreased specialised quality protests, and planned support. (Kaberger & Richu, 2015). Overall operational performance in the aspect of supply chain is typically the result of a combination of several system enablers and factors, and operational performance (OP) is a major enabler to this outcome (Lu, 2018). Saleh et al. (2018) state that delivery, flexibility, quality, cost, productivity, and customer happiness may all be used to assess operational performance. Businesses have to periodically assess their operational performance in order to identify issue areas and make the best use of resources. Moreover, operational performance may also be understood as the degree to which an organisation carries out its operations plan in order to support the higher-level objectives (Sylva, 2020). The actual results of the operations strategies used make up operational performance, which is determined by the operating conditions (quality, lead time, inventory, productivity, and costs) and reflects some internal characteristics of the production system (Ofoegbu & Efeh, 2022).

Operational performance measures how well an organisation executes its internal processes in terms of improving quality, complying with regulations, improving delivery, increasing profitability, and reducing costs and waste (Wagara, 2018). Operational performance, as defined by Truong (2014), is a company's ability

to reduce expenses, bid succession time and satisfy bids, obtain better raw material and organise its use and delivery capacity. Operational performance, which gauges an organization's internal operations quality, is a key factor in determining its capacity to compete and make money in the market (Hong, Liao, Zhang & Yu, 2019). According to Amarjit, Manjeet, Neil and Harvinder (2016), operational performance is a comprehensive indicator of how well a company uses its resources in its primary business activities to produce long-term income and profits. Operational performance, according to Chavez, Yu, Gimenez, Fynes, and Wiengarten (2015), is the strategic dimensions in which businesses decide to compete. The performance of an organisation is determined by its operations. To accomplish organisational objectives, a manufacturing organization's activities must be productive and efficient (Kamau, 2016). Operational performance refers to the measurable aspects of an organization's methodology's aftereffects, such as stock turns, era process term, and immovable quality (Wagara, 2018). Moreover, it serves as the cornerstone of both general organisational performance and quality procedures (Sharma & Modgil, 2020). The ability to meet customer needs is the primary basis for measuring operational performance (Kebede Adem & Virdi, 2020). When assessing the operational performance of firms, several measures can be considered. Here are three commonly used measures of operational performance: (1). Efficiency Measures: Efficiency is carrying out a task that may take the least amount of time and money while maintaining quality (Chorafas, 2015). Cost-effectiveness and resource utilisation are the main topics of efficiency measures. These comprise measures like asset utilisation, labour productivity, and cost efficiency. According to Johnston et al. (2020), these metrics evaluate how successfully a company uses its resources to produce output and reduce waste. Efficiency measuring techniques fall into three categories, according to Ertuğrul and Öztaş (2018): i) Ratio Analysis, ii) Parametric Methods, and iii) Nonparametric Methods. (2). Quality Measures: Quality measures assess how well a company's

goods and services live up to expectations from clients and conform to industry norms. Metrics like customer satisfaction, defect rate, and service level agreement (SLA) compliance offer valuable information on the calibre of goods and services that the company offers (Lin et al., 2020). (3). Innovation Indicators: Innovation indicators evaluate a company's capacity to launch novel goods, services, or workflows that provide it a competitive edge. A company's commitment to innovation is quantified by its R&D expenditure, the introduction of new products or services, and the production of intellectual property (IP) (Khan et al., 2018).

**Quality of Service:** As is well known, the name "service quality" combines the words "service" and "quality." As to Kumar's (2018) assertion, the provision of services entails an uninterrupted interchange of intangible activities aimed at resolving customers' concerns between service providers and customers, in return for the exchange of either tangible or financial resources. According to Kotler and Armstrong (2016), it is an action or advantage that one party provides to the other, and as it does not need ownership of anything, it is essentially intangible. According to O'Neill, Sohal & Teng (2016), quality is the extent to which a set of innate traits meets requirements and expectations. According to Sylva (2020), quality is the degree to which a product or service is outstanding, dependable, long-lasting, functional, and all-around excellent, all of which contribute to a positive customer experience. Increased market share, profits, user pleasure, and loyalty are all correlated with improved quality. Since quality is centred on what customers think, it can be defined as anything the customer considers to be a quality (Abdullah & Abdul Rahman, 2015). One of the most important aspects of operational success is quality, which involves following specifications and satisfying consumers. It has to do with maintaining consistency in terms of goods or services (Princewill & Umoh, 2022). According to Yarimoglu (2014), quality in the eyes of the client refers to features of a good or service that influence their happiness. The intention of customers to return can be positively and significantly impacted by the quality of service,

specifically by the clarity of the expected work time (Issn et al., 2019). Understanding the gap between client expectations and an organization's actual performance in providing services is the first step towards achieving quality, which is determined by how well a product or service satisfies the needs and expectations of the client (Lee et al., 2014). A service that meets the demands and expectations of its clients is considered to be of high quality (Sadaf & Rahela, 2019). Furthermore, Elvira & Shpetim (2016) defined service quality as a kind of evaluation that serves as a long-term representation of assessment. According to Abd-Elrahman et al. (2020), the degree to which a service meets or surpasses a customer's expectations, as well as the direction and degree of the disagreement between the two, are what constitute service quality. According to Ismail et al. (2016), customers describe service quality as a set of choices they make after using a product or service for a while.

Maintaining service quality is a crucial responsibility for all individuals working for a certain firm (Surahman, Yasa & Wahyuni, 2020). Consequently, in order to strengthen the industry's competitive edge in the market, service quality has always been a "customer-oriented" marketing point of view (Sultan & Wong, 2019). The majority of the time, consumer satisfaction with purchased services is correlated with service quality (Janahi & Al-Mubarak 2017). Service quality affects the outcomes of the service process, including loyalty, relationships, satisfaction, and trust. According to Anwar and Qadir (2017), service quality may be defined as an evaluation of how well a given service meets the expectations of the client. According to Yarimoglu (2014), service quality is regarded as an organisational asset and a crucial component of the company's marketing and financial success. Customers' attitudes and behaviours towards an organisation are influenced by the quality of the services they receive, according to Esmaeilpour, Sayadi, and Mirzaei (2017). According to Danish (2018), service quality is the comparing function that connects the services rendered to the expectations of the client. According to Phi

and Huong (2021), service quality is the provision of a service that completely satisfies the needs, expectations, and satisfaction of the client. The capacity of a service provider to adapt its offerings to the needs and desires of the community it serves is what is known as service quality. Customers will get dissatisfied and determine how to continue doing business with a service provider if the quality of the work they receive falls short of their expectations (Ma'ruf Khorif, 2021). According to Neupane and Devkota (2017), service quality is defined as the customer's overall assessment of the relative strength or weakness of a certain organisation and its service delivery.

Accordingly, the gap between what customers perceive and expect from a service can be used to determine service quality (Surahman et al., 2020). Kant and Jaiswal (2017) claim that a service's perceived quality is determined by comparing it to the expectations of the client, user, or customer prior to the purchase. The ability of hotels to satisfy guests' expectations is referred to as service quality (Prabhu et al. 2019). In order to conceptualise and measure service quality from a marketing perspective, Corkindale et al. (2018) proposed service quality from the perspective of economic and social processes. They highlighted the importance of providing service quality into human resource management and accepted the presence of the customer as fundamental to service operations. According to Fida et al. (2020), service quality is the fundamental capacity of a certain business or sector to satisfy the intended standards of its clients. Elvira and Shpetim (2016) delineated three aspects concerning the quality of service. Oudeh and Dandis (2018) define service quality as the difference between a client's expectations and actual performance. They describe technical quality, which outlines product specifications, as well as functional quality, which describes the service's delivery. Elvira and Shpetim (2016) emphasize the importance of the service provider's image quality, which includes both functional and technical aspects, to create a perceived service.

**Quality of Delivery:** The service providers whose aim is to deliver something of value to

their clients and acquire a market have high-quality services as their principal objective. As mentioned by Nguyen, de Leeuw, Dullaert, and Foubert (2019), the main focus of the delivery element is on time-doneness and speed. Delivery, as termed by Sylva (2020), is an indicator of timeliness that compares a company's ability to meet or react to user demand within a pre-defined time segment. For the information or products to be sent to the intended receiver accurately and effectively the delivery system (whether digital) is essential. They do all these, such as improving access to goods and services, lowering costs, and facilitating trade. The other effects include environmental, socio-economic, and economic impacts. They have a social effect and they are the key services of provision like healthcare, education, and emergency response. Tien et al. (2019) mentioned the features of a delivery system include system planning and routing, logistics and transport, inventory management, tracking and monitoring, security and reliability, and customer service. Some of the online learning systems are an example and this may include fast food delivery apps and postal services. The impact of a delivery system and its capabilities depend on the goal, coverage, and the target audience. Few authors like Sylva (2020) perceive delivery in terms of timely responsiveness and service flexibility. (1). Timely Responsiveness: According to Sylva (2020), responsiveness is the capacity of an organisation to promptly deliver goods or services to its clients and to quickly reorganise or reallocate resources in response to emergencies or shifting client needs. The willingness of the service provider to deliver services on time is referred to as responsiveness (Modding, 2016). The ability of service providers to deliver timely assistance is referred to as responsiveness (Selim, Kazi & Arif, 2017). (2). Service flexibility: Firms that possess flexibility respond quickly to shifts in costs, time, and consumer value while minimising losses. According to Sylva (2020), flexibility is the ability to quickly react to changes in demand for a product or service in terms of its specifications, volume, price, location, and on-time delivery. Resource

flexibility and coordination flexibility are the two primary types of flexibility that are distinguished by service delivery flexibility. Coordination flexibility presupposes a firm's ability to create novel, creative combinations and uses of resources through internal (intra-organizational) coordination procedures, whereas resource flexibility reflects a firm's ability to obtain resources with diverse uses and refers to the width of use of existing resources (Li et al., 2017; Wei, Yi & Guo, 2014).

### **Empirical Review**

Omhonria and Needorn (2022) did a research on production capacity improvement and organizational performance of manufacturing firms in Rivers State, Nigeria. In the study, a cross-sectional survey was used. Every one of the chosen companies was subjected to the systematic sampling procedure. One hundred forty-seven (147) people made up the sample size that was selected from the population. Respondents received copies of the questionnaires, which were used to collect data. The data was then analysed using Spearman's rank order correlation. The study revealed a strong positive correlation between the organisational performance metrics (objective achievement and operational efficiency) and the production capacity enhancement aspects (capacity utilisation and maintenance/control). Therefore, it was determined that achieving optimal capacity utilisation as well as appropriate capacity control and maintenance would enable manufacturing companies in Rivers State, Nigeria, increase their operational effectiveness and achieve their goals.

Kamau (2016) examined performance measurement practices and operational performance of manufacturing firms in Kenya. The research used in the study was descriptive. Since this study used the stratified sampling approach, the sample size consisted of 100 manufacturing enterprises. A structured questionnaire was employed in the study as a data collection tool. Version 24 of the Statistical Package for Social Sciences (SPSS) was used to evaluate the data that was gathered. The study found out that manufacturing enterprises in Kenya have an operational performance measures index of 63.95% and it also

demonstrated that there is a fair positive association between operational performance measures and performance measurement techniques. According to the study's findings, Kenyan manufacturing companies have widely adopted performance measuring techniques to enhance operational performance. Operational performance is positively impacted by performance measuring techniques.

Princewill and Umoh (2022) did a study on continuous improvement and operational performance of manufacturing firms and does organisational culture matter in Nigeria? A cross-sectional survey design was used in the study. The sample size consists of 72 participants selected from a population of 13 manufacturing companies. Through the distribution of a standardised questionnaire, study data was gathered. With the use of the Statistical Package for Social Science, descriptive statistics were examined using straightforward percentages and figures. The analysis' findings demonstrate a strong and positive correlation between operational performance metrics (quality and cost) and continuous improvement. This outcome demonstrates how manufacturing organisations' operational performance is enhanced through continual improvement. Furthermore, the study's conclusion that continuous improvement increases costs suggests that managers should constantly enhance their operations, include customers through feedback, and concentrate on their inputs in order to reduce costs as much as possible.

Ezeh (2020) studied the effective information dissemination and communication for sustainable quality service delivery. The study was designed using an analytical descriptive survey. The technique of proportionate stratified random sampling was employed to choose study participants. There are 549 participants in the sample (167 Principals and 382 Teachers). The instrument used to collect the data was a questionnaire. The Cronbach Alpha technique was used to analyse the data that was collected. The study's findings demonstrated that efficient information flow occurs when people are able to use email, SMS,

face-to-face interactions, and cell phones. They also demonstrated that efficient idea sharing, staff meeting management, message comprehension, and weekly goal communication are all necessary for effective communication. The aforementioned evidence led to the conclusion that principals require ongoing training in order to properly distribute information and engage in interpersonal communication.

### **Research Hypotheses**

The following research hypotheses were formulated and stated in a null form:

**Ho<sub>1</sub>** There is no significant correlation between production improvement function and quality of service of Nigerian Refineries.

**Ho<sub>2</sub>** There is no significant correlation between production improvement function and quality of delivery of Nigerian Refineries.

### **Methodology**

A random sample of 159 individuals was drawn from each of the four Nigerian refineries. However, in reality, only 124 out of the potential responses were obtained. By employing a census research design that allows for the utilisation of the entire population as a sample, the sample size (S) was calculated to be 124. Primary sources include data obtained through research questionnaires. In contrast, secondary sources consist of information obtained from publications, journals, textbooks, bulletin boards, and the internet. The acquired information was utilised exclusively for its intended purpose. Consequently, every piece of information that was acquired was withheld. The data were compiled through the meticulous selection of respondents who provided pertinent information. Answers to multiple-choice questions accompanied by brief explanations for each response will comprise the survey. For data analysis, structural equation modelling (SEM) was utilised. Out of the total 124 questionnaires that were distributed, 112 were returned after completion. We investigated the existence of a correlation between Production Improvement Function and Operational Performance using PLS-SEM.

Production Improvement Function = PIF  
Operational Performance = OPP

Quality of Service = QOS  
Quality of Delivery = QOD

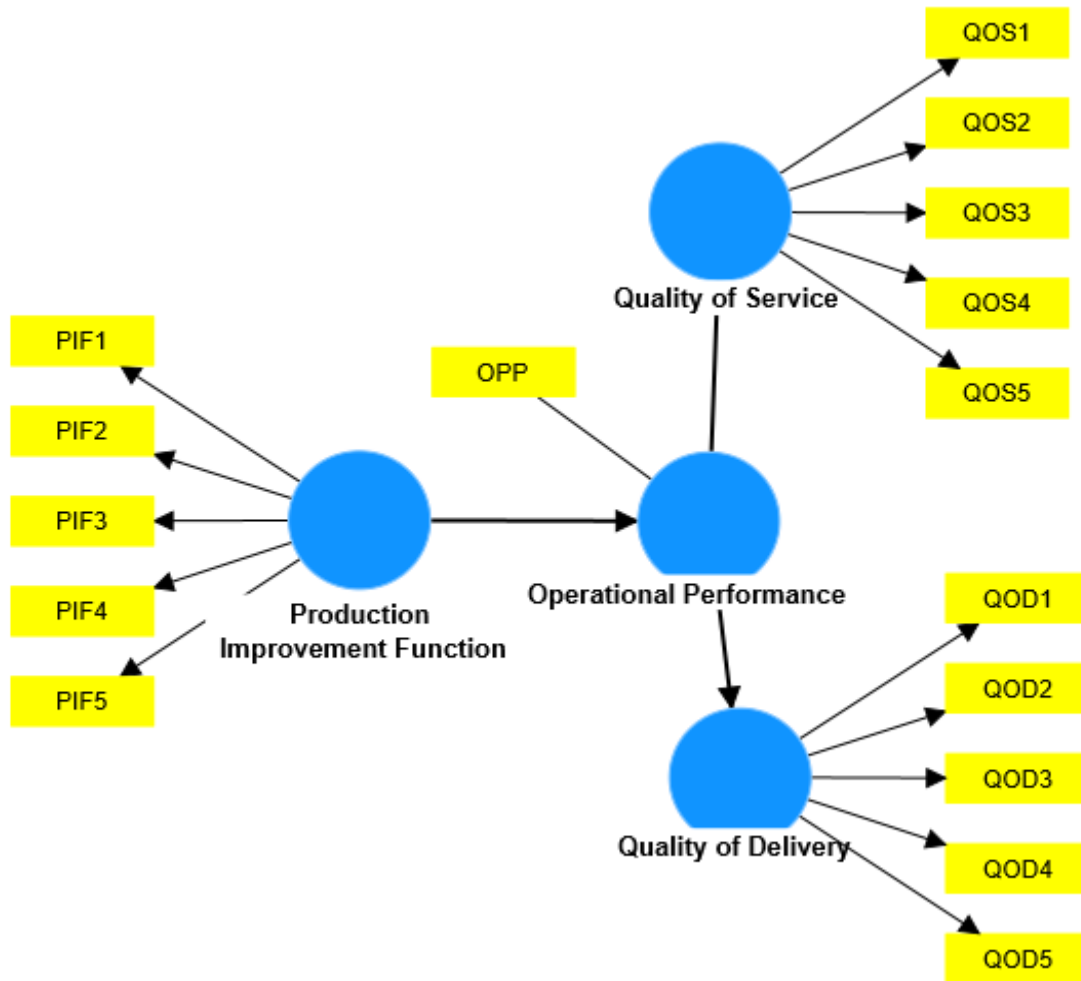
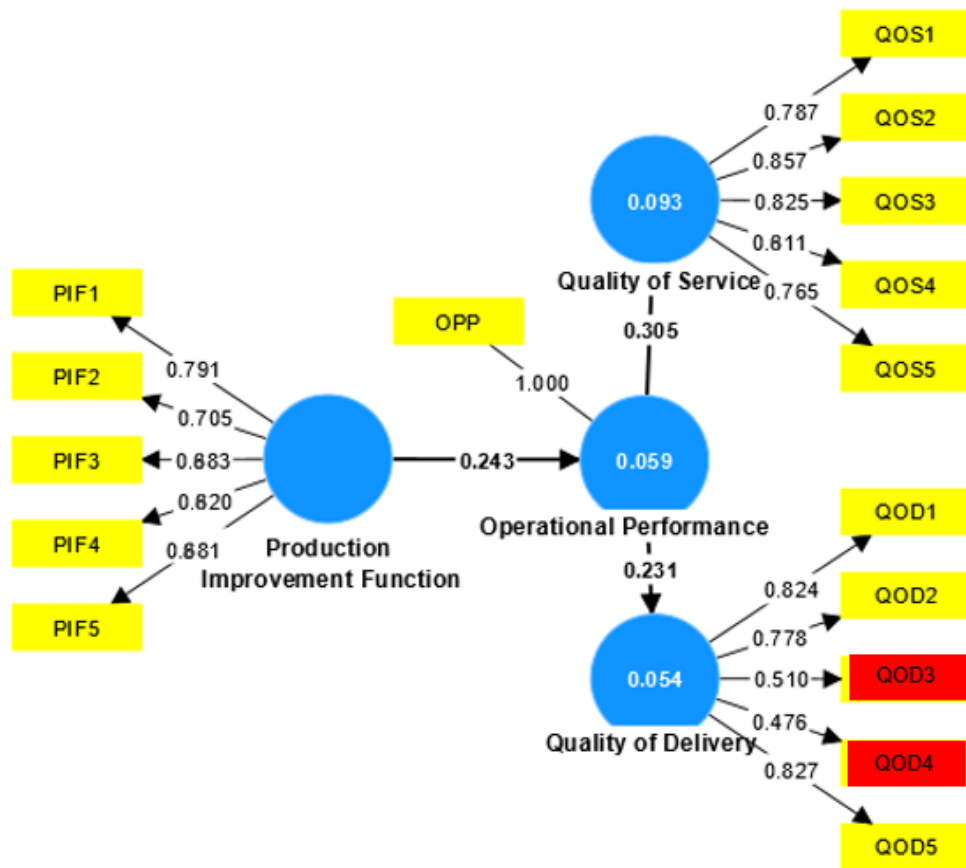


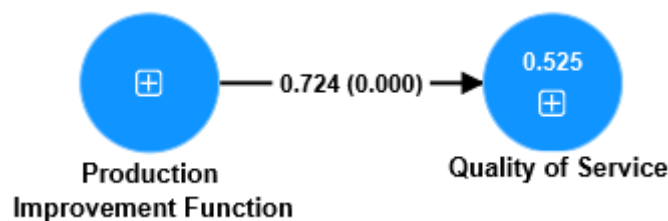
Figure 1: Research Model.





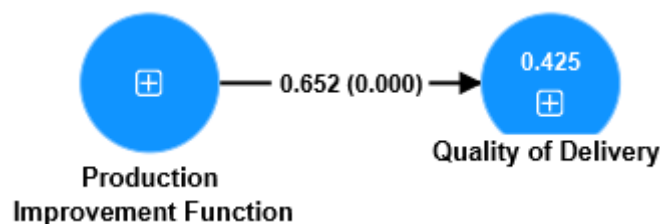
**Figure 2:** Output for Outer Loadings of Indicators

Figure 2 shows that all the response items for the constructs satisfied the threshold condition of 70%, however, QOD3 and QOD4 had outer loadings less than 0.7. Therefore, QOD3 and QOD4 were not used in the analysis.



**Figure 3:** Hypotheses 1

The path relationship analysis presented in Figure 3 indicate that there are positive and significant paths between Production Improvement Function and Quality of Service (where,  $\beta = 0.724$ ;  $p = 0.000$ ). Therefore, the null hypothesis 1 was rejected.



**Figure 4:** Hypotheses 2

The path relationship analysis presented in Figure 4 indicate that there are positive and significant paths between Production Improvement Function and Quality of Delivery (where,  $\beta = 0.652$ ;  $p = 0.000$ ). Therefore, the null hypotheses 2 was rejected.

**Table 1:** Hypotheses Testing Result

Hypotheses	Path Coefficient ( $\beta$ )	P Values ( $p$ )	Decision
Ho <sub>1</sub>	0.724 (Strong)	0.000 (Significant)	Reject null hypothesis
Ho <sub>2</sub>	0.652 (Strong)	0.000 (Significant)	Reject null hypothesis

*Source:* Research Output, 2024.

### Discussions on Findings

Ho<sub>1</sub> municipalizes that a sample correlation exists between the service quality of Nigerian refineries and production improvement function. The coefficient ( $\beta$ ) gives a strong and positive relation between the variables, with a value of 0.724. We thus accept the alternative hypothesis at a level of significance of 0.05 which answers that service quality and production improvement in Nigerian refineries correlate significantly. The discovery supports the assumption that the plant's operations can be improved to produce better output. Yet, more inquiry would be reasonable to explore all the specific paths by which product improvement leads to better service. It is also necessary to study possible moderating or mediating effect variables, which can alter this relationship (Igboanugo et al., 2016). Yet, policymakers and managers should also consider the employment of techniques aimed at improving the production process along with efforts geared towards the betterment of the quality of service. This will ensure that the Nigerian refineries have reached their full operational capacity and customer satisfaction. For Ho<sub>2</sub>, the product improvement function in the local refineries of Nigeria is not statistically significant concerning the relationship between quality of delivery and production. The results show a strong positive association between the variables based on the coefficients ( $\beta$ ), which is 0.652 with a significance level of 0.000 indicating that the findings are statistically significant at the conventional level. However, these results are vulnerable to be equivocal. The

fact that the statistical analysis has proved the existence of a correlation is important, although it is not proof that a causal relationship exists. Along with increased output, the quality of deliveries could be affected by market conditions, organizational culture, access to resources, and so on (Ayodele, 2021). Additionally, different results may be obtained considering the specific aspects and operational processes of the individual Nigerian refineries. Therefore, future studies should be directed to a more in-depth investigation of the underlying processes that causally connect quality of service and productivity and identify the possible moderators that could undermine their relationship (Igboanugo et al., 2016). From a practical point of view, we can infer that the efforts made in the process of optimizing the procedures might have improved the delivery quality at the Nigerian refineries, but the leadership should also take into consideration the influence of other parameters that are critical for the operations performance and continued leadership (Ayodele, 2021). This might mean the introduction of new technology solutions, conducting tailor-made basic training programmes, or cultivating supply chain management expertise to enhance overall delivery services as well as improve the customer experience.

### Conclusions

The integration of improvement strategies in processing improvement and service provision procedures in Nigerian refineries may lead to enhanced production processes and service delivery to maximize overall performance by

achieving operational efficiency. Funding for the development of modern technological tools, for example, automation systems, digital tracking, and diagnostic systems, as well as forecasting solutions, can speed up manufacturing and improve delivery capabilities. Employee training and development programs should be designed to cover all required skill sets so that the staff can handle new technologies in the best way and improve productivity and service quality. The practice of effective supply chain management is a must for the timely delivery of raw materials and material distribution purposes. That could be achieved through the supplier's strategic partnerships, inventory management solutions, and transportation logistics optimization. Continued monitoring and evaluation of production and delivery processes are indispensable as a tool for the identification of improvement points and the ensuring of further optimization. A robust performance monitoring system helps managers to trace the key performance indicators function of production effectiveness, service quality, and delivery performances. Meantime such allows management to take corrective measures proactively. Implementing these recommendations will help improve the refineries' operational efficiency, improve quality of service, and create a strong competitive position in the market, resulting in customer satisfaction and long-term success sustainably.

### Recommendations

Based on the outcome of this study, the following recommendations were made:

- i. Deploy integrated restoring approaches that concurrently address the improvement of both production processes and service delivery. This holistic strategy assures that the efficiency ratio is optimal for all segments of an operational plant, which results in an enhanced overall performance and customer satisfaction.
- ii. Heavy investment into the development of advanced technological solutions should be prioritized along with comprehensive training of employees. This will allow Nigerian refineries to

organize their operations for optimal performance and improved deliveries, so they can meet the demand and deliver exceptional services for sustained competitiveness.

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