

# PLATFORM AS A SERVICE AND SUPPLY CHAIN PERFORMANCE: EVIDENCE FROM NIGERIAN RETAIL PETROLEUM MARKETING FIRMS

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**Abstract:** This study empirically investigates the impact of platform as a service on supply chain performance of retail petroleum marketing firms in Rivers State of Nigeria. The quantitative approach was adopted to investigate the influence of platform as a service on supply chain performance. The survey approach was used as a measurement instrument, the simple random technique and a multi-item Likert scale anchored on five points response format were also utilized in the study. In order to make sure that the questions can be understood by the respondents, the questionnaire undergoes a pre-test and pilot test. The study field is the Retail Petroleum Marketing Industry in Rivers State of Nigeria and the respondents were 202 management staff of 55 retail petroleum marketing firms domiciled in Rivers State. The study espoused the Descriptive statistics; Simple Regression and Analysis of Variance (ANOVA), through the usage of the statistical package for social sciences (SPSS) procedures to carry out data analysis. The results indicate that; platform as a service has a strong, significant influence on logistics process flexibility, order fulfillment and information sharing. The study concludes that platform as a service significantly and positively influence supply chain performance through logistics process flexibility, order fulfillment and information sharing, and recommends that Retail petroleum marketing firms should improve on the effectiveness of their logistics process flexibility, order fulfillment and information sharing to maximize supply chain performance triggered by platform as a service.

**Key Words:** Nigeria, Platform as a service, Retail petroleum marketing firms, supply chain performance.

## 1. INTRODUCTION

Platform as a Service (PaaS) is an aspect of cloud computing technology that materialized in the 2000s as the ultimate phase of IT structural design intensification which alludes to “a computing model that enables organizations or individuals acquire computing power and software solutions through the internet or parallel networks” (Laudon & Laudon, 2014: 200). Currently, the PaaS market is still new. Nevertheless, as it fully develops, organizations are looking up to PaaS as a path to expanding overall cloud adoption across companies and to harmonize the development process. Today, the market is separated into fragments. Nevertheless, market research companies anticipate that the dispersal of market shares will alter excitingly in the future (Yang & Tate, 2012).

Some studies carried out to take in for questioning, the drivers of the adoption of cloud based services cut across distinct countries and for disparate industries (e.g., Lee et al.(2013; Gupta 2013; Benlian & Hess, 2011; Johansson & Ruivo, 2013; Wu et al., 2011; Oliverra et al., 2014; Low et al., 2011). There is no agreement on which are the predominant factors for cloud based service adoption.

There exists a dearth of scholarly inquiries on platform as a service and supply chain performance in the retail petroleum marketing firms in Nigeria. Against this background, the present study assess platform as a service of Nigerian retail petroleum marketing firms to realize affirmative supply chain performance, and overpass the breach in knowledge by providing a PaaS model through the lens of the Technological Organization Environment (TOE) Model.

### Statement of the Problem

Few studies have tackled the influence of platform as a service on supply chain performance. Apparently, none studied Nigeria, and so forming an opinion about their findings may impair validity and/or yield opposite outcomes owing to Nigeria’s peculiarity. Although, much evidence has accumulated to explain platform as a service, there is still no consensus in the developed world or even in the third world, where much research has been conducted, on the predominant factors for PaaS, because leading scholars seems to

have arrived at different findings. For instance, Lee et al. (2013) classified cloud based adoption drivers into four groups: Suppliers, customers, technological, and environmental. Gupta (2013) distinguished ease of use and convenience as prime factors of adoption. Benlian and Hess (2011) identified cost advantages as a major adoption driver. Some authors insinuate factors like cost, trust, ease of use, reliability, sharing collaboration (Gupta et al., 2013; Johansson & Ruivo, 2013; Wu et al., 2011). Support from top management, size of firm, technology readiness, competitive pressure (Oliverra et al., 2014; Low et al, 2011). Johansson and Ruivo (2013) placed compatibility and availability as paramount in the decision to adopt cloud-based services. Thus, with a view to complementing the body of knowledge on platform as a service and supply chain performance, the current study seeks to investigate the link between the variables; using platform as a service (PaaS) on supply chain performance (logistics process flexibility, order fulfillment and information sharing) in the retail petroleum marketing firms in Rivers State of Nigeria

### Research Question

Is there significant impact of platform as a service on supply chain performance?

### Research Hypotheses

**Ho<sub>1</sub>** Platform as a Service implementation does not significantly influence logistics process flexibility.

**Ho<sub>2</sub>**: Platform as a Service implementation does not significantly influence order fulfillment.

**Ho<sub>3</sub>**: Platform as a Service implementation does not significantly influence information sharing.

## 2. LITERATURE REVIEW

An all-encompassing review of literature was made to appreciate two foremost impressions of the study, i.e., platform as service and supply chain performance.

### Theoretical Foundation

Technological Acceptance Model (TAM)

This model posits that innovation is a function of three facets: Organization, Environmental and Technology accessible in the market employed, or not, by the organization (Tarnatzky and Fleibher (1990) in Baker 2012). The TOE is architecture for investigating and collecting of products and ICT services on the organizational level. Zhu, Kraemer, Xu and Detric (2004) assert that this model is a far-reaching theoretical framework providing an extensive background of impression and agility and that ensures impact on business decisions.

Adopting information technology demands that business congregate architecture to back up operations in decision making. This model envisages the behavioural intention of technology application and proposed its usefulness as a delicate contributory force to embrace technology. The TAM model has been broadly examined and extended into distinct aspects and therefore, effort is made by supply chain managers regarding activities in retail petroleum marketing firms. Since cloud based services affords businesses the opportunity to integrate forward logistics with reverse logistics in a particular closed-loop supply chain pattern. This model has been extensively employed originally in IT literature and stresses the importance of trust to diminish uncertainty. The weakness of the model framework comes handy as its major constructions are not very obvious and precise determinants.

A research of this nature sees PaaS as a theoretically informed consortium of established device spanning and projecting factors that impact logistics process flexibility (LPF), order fulfillment (OF) information sharing (IS) and how it can lead to efficiency in firms.

### Definition of Platform as a Service

Platform as a service tenders a towering level of conception compared analogous to Infrastructure model that concentrates on tendering raw entrance into real or material architecture (Garg & Buyya, 2012). As conceptualized by Tsai (2010), it is a set of subsystem that ushers a stream of related products. Rodero-Merino et al. (2011) noted that PaaS concerns transfiguration of proceeding immensely guarded into platforms and associated components or applications developed in compelling ecosystems of third-party

developers. Tiwana et al. (2010) posit that PaaS furnishes a container platform and execution setting where third-party developers deploy and run their applications. This existing growth pattern empowers developers to connect into the benefits of value co-creation and to utilize exterior proficiency and innovativeness on an un-heard-of measure (Rodero-Merino et al.,(2011).

Marston et al (2011) allude to PaaS as a class services that supplies enticing base and supervise applications and does not experience complications of erecting and sustaining the device. Butler (2013) Proffers an execution setting anchored on software where in, a container platform is offered to enable consumers extend and manage their components. Chang, Abu-Amara and Sanford (2010) describes PaaS as an abstraction layer from the underneath infrastructure layer encompassing network, servers, operating system or storage. To this, Khalid (2010) and Lacity and Reynolds (2014), reveal development testing and ongoing maintenance, while Rimal, et al (2010) stipulate complete software development.

A platform is provided on which client gain possession of software to develop their applications. (Tsai et al, 2010). The third party vendors supply customers with virtual resources to develop, deploy and launch software applications minimizing the requirement for backend software development. This implies that PaaS brings into existence, software constituent parts, and interfaces and the service provider is accountable for sustenance of the work environment and operating systems, while the developer regulates the application data.

Platform as a service is a cluster of services that outline application infrastructure, operating system, middleware and configuration item by item, that furnishes developer teams with the aptitude to supply, build, test, and position applications. This study, in line with Tsai et al, (2010 ) defines PaaS as a class of cloud computing service type that supplies a computing platform and solution bunch upon which applications and services can be rendered through the use of mobile phones, tablets, laptops and workstations for organizational efficiency. This is because, platform-as-a-service (PaaS) supplies a computing platform and solution bunch upon which applications and services can be rendered. Li and Yan (2017) notes that businesses employ PaaS for outsourcing, hosting, construction, security and storage. Some examples of PaaS are Google Apps and Windows Azure. Windows Azure is a service provided by Microsoft, where someone can develop, organize and administered all the operations through a network of data centers anchored on a Microsoft environment.

### Supply Chain Performance

Performance is an intrinsic construct in the strategy literature. The concept of performance is three fold. For example, performance can be approached as the ultimate goal of management, an end in itself, and can be highlighted at the level of individual managers, teams, businesses and corporations. Performance can also be approached from a measurement perspective, with a focus on the selection of the appropriate indicators and levels for quantifying an organization's outcomes (Guerard et al., 2013; Luoma, 2015).

Performance measurement is generally defined as the process of quantifying the efficiency and effectiveness of action (Neely et al., 1995). According to Bhagwat and Sharma (2007), performance measurement describes the feedback on operations which are geared towards customer satisfaction, strategic decisions and objectives. They further point out that performance measurement reflects the need for improvement in operational areas which are referred to as bottlenecks in performance measures. Performance measurement is an important aspect of successful SCM. Gunasekaran et al. (2001) described effective performance measurement as necessary for SCM. Lai et al. (2002) further asserted that the lack of adequate performance measurement is one of the major obstacles to efficient SCM. The importance of performance measurement systems can be appreciated in its ability to drive organizational actions, serve as a framework for decision making and closed Loop control (Abu-Suleiman et al. 2004)

This study defines supply chain performance as an evaluation of a firm's facility to sensibly convene logistics process flexibility, order fulfillment and information sharing objectives in order to boost optimal efficiency.

**Logistics Process Flexibility:** Is a firm's aptitude to cope with expanding assortments of customer requirements in the absence of immoderate costs, organizational disorders or performance perils.

**Order Fulfillment:** Order fulfillment is the act or process of delivering a product to a customer to assuage customers' requirements.

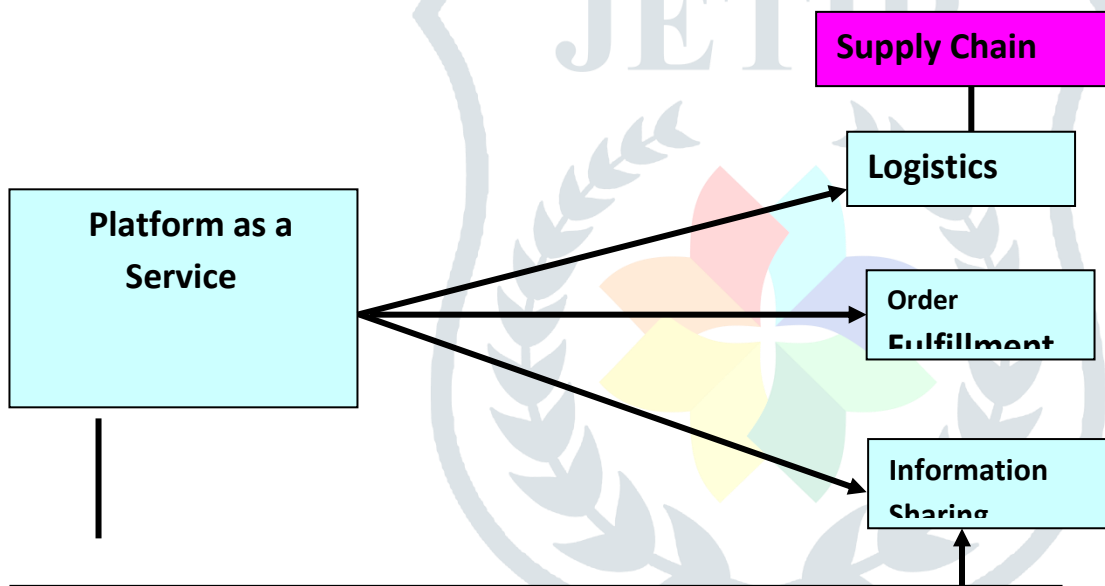
**Information Sharing:** This connotes the aggregation of communication or intelligence stream to make perfect, effective and functional the generic supply chain by sharing information among suppliers, manufacturers, distributors and retailers

## Platform as a Service and Supply Chain Performance

Chen et al. (2016) studied how adapters see competitive advantage under the moderating influence of firms' size and value chain activities. A questionnaire on 7000 firms in Taiwan, through postal mails was administered to respondents. Variables envelope improved capability and enhanced scalability. Based on 65 usable questionnaires, the ANOVA was employed for data analysis. The study discovered that composite benefit in PaaS exist marginally in supply chains.

Lal and Bharadwaj (2016) investigated the elements responsible for embracing innovations and advanced its understanding. The study employed an interview and semi-structured questionnaire approach. The study used a theoretical sampling method on 21 firms in India. The study found that a significant effect of these factors supply relative advantage in terms of scalability, accessibility, and on demand deployment of services and easy to use interface, experience, and expertise of the cloud service provider and support from top management is significant in the decision to adopt cloud based services. The study also revealed that platform as a service (PaaS) impacts organizational flexibility.

### CONCEPTUAL MODEL AND HYPOTHESES



**Figure 1:** Conceptual Model of the influence of Platform as a Service on Supply Chain Performance.

**Source:** Designed by the researchers.

The general form of the model was as follows:

$$SCP = \alpha + \beta_1 X_1 + e$$

Where, SCP = Supply Chain Performance

$X_1$  = Platform as a Service

And  $\alpha$  is constant and  $\beta_1$  is coefficient to estimate, and  $e$  is the error term

### 3. RESEARCH METHODOLOGY

This study adopted the quantitative approach to investigate the influence of platform as a service on supply chain performance. To achieve the goal of this study which is to examine management's perception of the implementation of PaaS in their organizations, the study used the survey approach as a measurement instrument, the simple random technique and a multi-item Likert scale anchored on five points response format. In order to make sure that the questions can be understood by the respondents, the questionnaire undergoes a pre-test and pilot test. The study field is the Retail Petroleum Marketing Industry in Rivers State of Nigeria and the respondents are 202 management staff of 55 retail petroleum marketing firms domiciled in Rivers State. The questionnaire has two parts; the first is the demographic questions which mirror a number of the personal features of the respondents. The second part is the general questions on the subject of the focal variables in the study. The Simple Regression and Analysis of Variance (ANOVA), through the usage of the statistical package for social sciences (SPSS), were exploited to carry out data analysis.

### 4. RESULTS AND DISCUSSION

#### 4.1 Results of Descriptive Statistics of Study Variables

##### Demographic Evaluation of the Participants

Importantly, the participants were analyzed demographically to substantiate and ascertain the degree to which they have experience on the topic considered. This is illustrated in Table 1.

**Table 1: Demographic Evaluation of Participants (n=202)**

S	Factors	Frequencies	%	S/N	Factors	Frequencies	%
1	<b>Gender</b>						
	Male	127	62.9				
	Female	75	37.1	4	<b>Educational Qualification</b>		
					SSCE/OND	50	24.8
2	<b>Age Bracket</b>				HND/BSc	83	41.1
	18-27	33	16.3		MBA/MSc	56	27.7
	28-37	72	35.6		Ph.D	12	5.4
	38-47	58	28.7	5.	<b>Years in Business</b>		
	48 and above	39	19.3		1-10 years	110	54.5
					11-20 years	55	27.2
3	<b>Marital Status</b>				21-30 years	10	5.0
	Married	106	52.5		31 and above	27	13.4
	Single	84	41.6		<b>Respondents Title</b>		
	Widow	8	4.0		Petrol Terminal Manager	51	25.2
	Divorced	4	2.0		PetrolTransport/Logistics Manager	49	24.3
					Petrol Station Manager	50	24.8

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**Source: Survey Data, 2019.**

The participants' demographic evaluation consists of gender, age, marital status, educational qualification, years in business and respondents title in the retail petroleum marketing firms in Rivers State. This is further elaborated below:

**Gender of Participants**

127 (62.9%) males of total respondents responded to the survey instrument, and 75 (37.1%) females were participants in the study. The male staff of the retail petroleum marketing firms surveyed participated more in the study.

**Age of Participants**

Participants who participated in the study were grouped under the age classification of, 18-27, 28-37, 38-47, and 48 and above. 72 participants were classified under the age of 28-37, reporting for the highest number of participants. Those classified under the ages 38-47 are 58 returned the second highest outcome, 39 of the participants are classified under 48 and more years produced the third highest outcome. Finally, 33 participants were around 18-27 years.

**Participants Marital Status**

The study captured four marital statuses in this study and they includes 106 married respondents (52.5%), 84 single (41.6%), 8 widow (4.0%), and 4 divorced (2.0%). From the four marital statuses captured, 106 representing (52.5%) of the participants are married, 84 (41%) of the participants are single, 8 (4.0%) of the participants are widowed while, 4 (2.0%) are divorced.

**Educational Qualification**

The study also captured four categories of educational backgrounds which includes 50 Senior Secondary School Certificate/ National Diploma holders (24.8%), 83 Higher National Diploma/Bachelor of Science degree holders (41.1%) 56 Master of Business Administration/Master of Science degree holders (27.7%), and 13 Doctor of Philosophy degree holders (6.4%). The categories with HND/BSC responded more to the research questionnaire, followed by MBA/MSc degree holders. The SSCE/OND certificate holders were the third highest respondents on the instruments, while the least response rate came from the PhD degree holders. Thus, the sample was composed of people with disparate educational background.

**Participants' Years in Business**

The years in business of the respondents is shown in table 4.2 and it depicts that 110 (54.5%) of the participants have worked for 1-10 years in their firms, 55 (27.2%) have worked in their various firms for 11-20 years, 10 (5.0%) have worked for 21-30 years, and 27 (13.4%) have worked for 31 and more years in their various firms.

**Respondents Title**

The respondents title encompass 51 Petrol Terminal Managers (25.2%) who responded to the questionnaire, 49 Petrol Transport/Logistics Managers (24.3%) responded to the questionnaire, 50 Petrol Station Managers (24%) participated in the study, 52

Petrol Station Supervisors (25.7%) were subjects in the study.

**Test of Reliability**

As soon as the reproduced distributed questionnaires were ascertained, the reliability scale was subsequently investigated through the computation of the variables coefficient alpha (Cronbach alpha). It was ascertained that all scales outran the least quantity admissible of 0.7.

**Table 2: Measure of Platform as a Service and Supply Chain Performance (n=202).**

Scale	Dimension	Items	Reliability
PaaS	Platform as a Service	5	0.957
LPF	Logistics Process Flexibility	4	0.885
OF	Order Fulfillment	4	0.962
IS	Information Sharing	4	0.954

**Source: SPSS Output, 2019.**

Table 2 presents a summation of Platform as a Service and Supply Chain Performance. The reliability test of individual dimension and measures were also included and these were employed to investigate Platform as a Service architecture and Supply Chain Performance of retail petroleum marketing firms in Rivers State of Nigeria. The influence of platform as a service on supply chain performance was operationalized using platform as a service (.957) with 5-details valuation; logistics process flexibility (885) with a 4-item detail; order fulfilment (.962) with a 4-detail measures; information sharing (.954) with 4-details measure, supply chain performance (897) with a 4-detail measure and interorganizational trust (.947).

**4.2. Results of Statistical Test of Hypotheses**

**H<sub>01</sub>:** Platform as a Service implementation does not significantly influence Logistics Process Flexibility.

**Table 3: Regression Model for Platform as a Service and Logistics Process Flexibility**

Model1	Adjusted	R	std error of the
R	R square	Square	Estimate
.766 <sup>a</sup>	.587	.585	2.104

**a. Predictors: (Constant), Platform as a Service**

**b. Dependent Variable: Logistics Process Flexibility**

**Source: SPSS Output, 2019.**

The sum of logistics process flexibility was regressed with the sum of platform as a Service. The value of R is 0.766. The R value of 77% represents the correlation between platform and logistics process flexibility. R<sup>2</sup> is 0.587. This means that 59% of the change in logistics process flexibility is clarified by the independent variable. It shows that PaaS makes a contribution of 59% to every change in logistics process flexibility, while 0.41% of the change is not clarified by the model.

**Table 4: ANOVA for Platform as a Service and Logistics Process Flexibility**

Model	Sum of squares	Df	Mean square	F	Sig.
Regression	1256.707	1	1256.707	283.933	.000 <sup>b</sup>
Residual	885.214	201	4.426		
Total	2141.921	202			

**a. Dependent Variable: Logistics Process Flexibility**

**b. Predictors: (Constant), Platform as a Service**

**Source: SPSS Output, 2019.**

The adequacy of the model can also be clarified by the value 283.933 (F-ratio), at  $p < 0.05$ . This implies that there is evidence to extrapolate that platform as a service is linearly related to logistics process flexibility. This proposes that the model is measured to be fit and that the platform as a service implementation has substantial influence on Logistics process flexibility.

**Table 5: Coefficients of Platform as a Service and Logistics Process Flexibility.**

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. error	Beta	T	
Constant	5380	.706		7.616	.000
PaaS	.945	.056	.766	16.850	.000

**a. Dependent Variable: Logistics Process Flexibility.**

**Source: SPSS Output, 2019.**

The model illustrates that: Logistics Process Flexibility = 5380 + 0.945 Platform as a service. For a given unit of the Platform as a service, Logistics Process Flexibility is increased by 0.945. The result reveals that platform as a service is significantly correlated with logistics process flexibility based at 1% ( $p = 0.01$ ), while beta and t-value of independent variable value are 0.766 and 16.850, respectively. This implies that Platform as a service brings about (positive) increase in Logistics Process Flexibility.

#### **Decision:**

**H<sub>01</sub>:** Platform as a service implementation does not significantly influence logistics process flexibility, is rejected ( $p < 0.05$ ), and the alternative hypothesis, which states that platform as a service implementation significantly influences logistics process flexibility, is accepted. Therefore, the study can conclude that platform as a service significantly influences logistics process flexibility.

**H<sub>02</sub>:** Platform as a Service implementation does not significantly influence Order Fulfillment.



**Table 6: Regression Model for Platform as a Service and Order Fulfillment**

Model 1	Adjusted R square	R	Std error of the Estimate
	.567	.755 <sup>a</sup>	2.754

a. Predictors: (Constant),

b. Dependent Variable: Order Fulfillment

Source: SPSS Output, 2019.

The sum of order fulfillment was regressed with the sum of platform as a service. The value of R is 0.755. The R value of 75% represents the correlation between platform as a service and order fulfillment. R<sup>2</sup> is 0.570. This means that 57% of the change in order fulfillment is explained by the independent variable. It shows that platform as a service makes a contribution of 57% to every change in order fulfillment, while 0.43% of the changes are not clarified

**Table 7: ANOVA for Platform as a Service and Order Fulfillment**

Model	Sum of squares	Df	Mean square	F	Sig.
Regression	2007.519	1	2007.519	264.712	.000 <sup>b</sup>
Residual	1516.759	201	7.584		
Total	3524.277	202			

a. Dependent Variable: Order Fulfillment

b. Predictors: (Constant), Platform as a Service

Source: SPSS Output, 2019.

The adequacy of the model can also be clarified by the value 264.712 (F-ratio), at  $p < 0.05$ . This implies that there is evidence to extrapolate that platform as a service is linearly related to order fulfillment. This proposes that the model is measured to be fit and that platform as a service has substantial influence on order fulfillment.

**Table 8: Coefficients of Platform as a Service and Order Fulfillment.**

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. error	Beta		
Constant	1.121	.925		1.212	.227
PaaS	1.195	.073	.755	16.270	.000

a. Dependent Variable: Order Fulfillment.

Source: SPSS Output, 2019.

The model illustrates that: Order Fulfillment = 1.121 + 1.195 Platform. For a given unit of Platform, Order fulfillment is increased by 1.195. The result reveals that platform is significantly correlated with order fulfillment based at 1% ( $p = 0.01$ ), while beta and t-value of independent variable value are 0.755 and 16.270, respectively. This implies that Platform as a Service brings about (positive) increase in Order Fulfillment.

#### Decision:

**H<sub>02</sub>:** Platform as a Service implementation does not significantly influence order fulfillment, is rejected ( $p < 0.05$ ), and the alternative hypothesis, which states that platform as a service significantly influences order fulfillment, is accepted. Therefore, the study can conclude that platform as a service significantly influence order fulfillment.

**H<sub>03</sub>:** Platform as a service implementation does not significantly influence information sharing.

**Table 9: Regression Model for Platform as a Service and Information Sharing**

Model 1	Adjusted	R	std error of the
R	R square	Square	Estimate
.692 <sup>a</sup>	.481	.429	2.872

**a. Predictors: (Constant), Platform as a Service**

**b. Dependent Variable: Information Sharing**

Source: SPSS Output, 2019.

The sum of Information Sharing was regressed with the sum of platform as a service. The value of R is 0.692. The R value of 69% represents the correlation between Platform as a service and information sharing. It represents a vigorous correlation between platform and information sharing. The R<sup>2</sup> is 0.481. This means that 48% of the change in information sharing is clarified by the independent variable. It shows that platform as a service makes a contribution of 48% to every change in information sharing, while, 0.52% of the change is not clarified by the model.

**Table 10: ANOVA for Platform as a Service and Information Sharing**

Model	Sum of squares	Df	Mean square	F	Sig.
1	Regression	1527.244	1	1527.244	185.124
	Residual	1649.969	201	8.250	
	Total	3177.213	202		

**a. Dependent Variable: Information Sharing**

**b. Predictors: (Constant), Platform as a Service**

Source: SPSS Window Output, 2019.

Adequacy model can also be clarified by the value 185.124 (F-ratio), at  $p < 0.05$ . This implies that there is

evidence to extrapolate that platform as a service is linearly related to information sharing. This proposes that the model is measured to be fit and that platform as a service has substantial influence on information sharing.

**Table 11: Coefficients of Regression Model for Platform as a Service and Information Sharing.**

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. error	Beta	T	Sig.
Constant	1.204	.622		1.937	.054
PaaS	.530	.058	.355	9.171	.000

**a. Dependent Variable: Information Sharing.**

**Source: SPSS Output, 2019.**

The model illustrates that: Information Sharing =  $-1.204 + 0.530$  Platform as a service. For a given unit of Platform as a service, Information Sharing is increased by 0.530. The result reveals that platform as a service is significantly correlated with information sharing based at 1% ( $p = 0.01$ ), while beta and t-value of independent variable value are 0.355 and 9.171, respectively. This implies that Platform as a service brings about (positive) increase in Information Sharing.

#### Decision:

**H<sub>03</sub>:** Platform as a service implementation does not significantly influence information sharing, is rejected ( $p < 0.05$ ), and the alternative hypothesis, which states that platform as a service implementation significantly influences information sharing, is accepted. Therefore, the study can conclude that platform as a service implementation significantly influences information sharing.

The empirical outcomes offer strong evidence for the explanatory power of our research model. Firstly, we found that PaaS influence supply chain performance. Thus, H<sub>1</sub>, H<sub>2</sub> and H<sub>3</sub> were accepted. These results successfully established the importance of platform as a service in retail petroleum marketing firms. PaaS has a strong, significant and positive influence on logistics process flexibility. From our findings, it could be said that the retail petroleum marketing firms use of platform as a service is appealing, thus the outcome on logistics process flexibility became as expected. Our finding supports that of Battleson et al. (2016,) who revealed that organizations respond swiftly to technological innovation by embracing it.

The second hypothesis sought to ascertain the influence of PaaS on order fulfillment. PaaS has positive association with order fulfillment. Companies' employs flexibility in decreasing their inventory level and subsequently experience an increase in efficiency in meeting customers' orders. Relying on platform as a service could enhance supply chain performance, given that companies whose order fulfillment activities are effectively handled in a flexible manner to attract desired goals which lead to higher performance. This corroborates with the findings of Lal and Brahadwaj (2016) who revealed that platform as a service (PaaS) impacts organizational flexibility.

The third hypothesis revealed a strong influence of platform as a service on information sharing. This indicates the significant role PaaS plays in improving information sharing in supply chains, enabling technology influence the domain of information and communication pervasively. This assertion is in line with Tan, Shaw & Fulkerson (2008) assertion that software constituent technology ease information sharing by furnishing a midpoint for harmonizing assorted information systems.

Finally, as we proposed and expected that supply chain performance is influenced by platform as a service, supporting H<sub>1</sub>, H<sub>2</sub> and H<sub>3</sub>. It is clear that logistics process flexibility, order processing, and information sharing are the key metrics of supply chain performance' and it is believed that retail petroleum marketing firms may improve their performance. Consistent with prior cloud based literatures, this study also confirmed that the use of technology-enabled services implies self-assurance and conviction that the system will perform adequately, precisely and consistently, and distribute the goods and services required.

## 5. Conclusion

Generally, this empirical study has effectively investigated the influence of platform as a service on supply chain performance. By selecting Nigerian retail petroleum firms as the research intention, the study have shown interesting findings as decisive contributions for both IS researchers and practitioners. Based on this, the study concludes that platform as a service significantly and positively influence supply chain performance through logistics process flexibility, order fulfillment and information sharing.

## 6. Implication

The main contribution of this research was to lay a descriptive theoretical foundation of retail petroleum marketing firms' supply chain and all its details. This pedestal is a preliminary summit in looking at other supplementary explicit concerns of this composite supply chain. This study is amongst the first to take an all-inclusive examination into a precise oil and gas supply chains. In doing so, it convey knowledge into this up-and-coming field of research, which is in need of further comprehensive exploration.

## 7. Recommendation

Retail petroleum marketing firms should improve on the effectiveness of their logistics process flexibilities, order fulfillment and information sharing to maximize supply chain performance triggered by platform as a service.

## 8. Limitations and Directions for Further Studies

This study call for further studies to evaluate the generalizability of our findings. First, our study was carried out in Nigeria, under comparatively reasonable technology development, thus further studies should be performed in an assortment of countries. Second, the study did not have a large sample size for this experiential study for the infiltration of retail petroleum marketing firms in this country is moderately little. The study just had two hundred and two legitimate respondents. Vigorous and more structural investigations are required for future research. Lastly, as the study collected data in the oil and gas sector of the economy, further research is required to authenticate the model by means of dissimilar sample distinctiveness.

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