

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

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Abstract

This study logically considered the influence of software as a service on supply chain performance of retail petroleum marketing firms in Rivers State of Nigeria. A connecting blueprint exploration and a replica were invented en route for validating the three suppositions of interest. The simple random technique was assumed to select 202 personnel out of 55 retail petroleum marketing firms reflected on and quantitative facts attained by means of a controlled questionnaire. The investigation espoused descriptive statistics, regressions and analysis of variance course of action to establish that software as a service is serviceable in engineering supply chain performance. The results established that software as a service was affirmative and significant in manipulating logistics process flexibility, order fulfillment, and information sharing, and concludes that the outcome of the quantitative analysis make obvious to facilitate software as a service programmes of retail petroleum marketing firms in Rivers State as manipulating supply chain performance. The implication for managers is that they will now embrace software as a service to boost supply chain performance in their organizations, so as to make a difference and enhance competitive advantage in the market place. The study recommends that Managers of retail petroleum marketing firms should focus strategically on software as a service to initiate greater performance. Supplementary inquisitions on software as a service and supply chain performance can be carried out in other quarters to validate outcome of this study.

Key Words: Retail petroleum marketing firms, Rivers State, Software as a service, Supply chain performance.

1. INTRODUCTION

Typically, sustainable supply chain performance ought to be within reach, but, as providence would have it, this is not the case. The hold back is that most business operators do not possess the enabling technology to endear sustainable competitive advantages. Retail petroleum marketing firms are playing important roles in the economy of every country and as they are increasing faster; it is also predictable that they will face some opportunities and threats. As far as opportunities are concerned, they have likelihood to amplify their competitive advantage. Therefore, in order to maintain their competitive position, retail petroleum marketing firms have to work on the implementation of software as a service. Supply chain partners need to be further engrossed in knowing about the background of software as a service and how it connects with supply chain performance.

Retail petroleum marketing firms face progressively greater sophistications, imminence and unpredictability, it is therefore an imperative need or duty for them to become speedy and additionally able to move quickly and easily in order to continue to function and develop. They are required to bring about new ways to work with their supply chains to achieve positioned goals, ways that influence the peculiar skill sets of each organization. It is indispensable to observe that for any business to stay intuitively and contend approvingly in presented industry topography, they require holding close knowledge of information technology, such as software as a service in the direction of accelerating growth or progress.

Software as a service has little by little enthused to a customary in progress track of goings-on or authority in the information technology vicinity of curiosity. It is an invention conveyed as a service, thronged midpoint and positioned by a merchant easily reached to customers who pay for the service. As an invention conveyed, it is simplified by internet allied foundation [1]. Software as a service is the on hand scheme of making available to users way out [2], and customers pay for software utility handling, minimizing the software acquisition and continuation overheads [3].

More than a few preceding inquisitions on software as a service and supply chain performance has amassed ([4], [1], [5], [6], [7]). These studies could not confirm the track of causation between software as a service and supply chain performance. Above and beyond, a gaze at the finest of writings on the other hand, comes into sight to show that few empirical studies have explored the involvement of software as a service on supply chain performance. This study's curiosity is therefore clued-up by recognizing the inimitable nature of software as a service as locomotive for effective schedule. Therefore, with the view of filling the knowledge gap that has been acknowledged, the existing study is besieged at probing into the link between software as a service performance in the retail petroleum marketing industry in Rivers State of Nigeria. The backdrop that provoked an investigation such as this emerged from this very fact.

2.LITERATUREREVIEWAND HYPOTHESES DEVELOPMENT

The Concept of Software as a Service

Software as a service (SaaS) replica can be sketched back in 1990, and has progressively enthused to a widespread modern-day or trend of goings-on or authority in the information technology vicinity of curiosity. As a product conveyed as a service, thronged midpoint and tendered by a vendor easily reached by customers who pay for the service is alleviated by internet allied source, released unmistakably and conceding means of advance through the internet [1]. Sultan [8] tender software as services built up for the customer. Mell and Grance [2] scrutinize that software is the on hand scheme of endowing users with solutions. This becomes d'être for passing on software as on demand. Clients pay for software request handling, minimizing the software acquisition and continuation outlay [3].

Supply Chain Performance

The concepts Supply chain performance presages a company's plane of partnership with its affiliates which are indispensable in the commencement, department, or wrapping up of tactical conveyance policy [9]. It is a progression of unremitting dealings and transformation of routes remodeling and harmonizing fabrications and shipments [10]. Supply chain management endeavour at assimilating progressions which go beyond doorsill of partners [11], in view of the fact that a prevalent frame of mind on how greater information possibly will be made possible and harmonized for the absolute consciousness of functional information by affiliates is recognized [12]. It is in the necessities that surpass line threshold of getting-together the customers' necessities all the way through product or service conveyance [13]. It desires upgrading and perpetual apparatus that instigate assessors [14]. This investigation espoused logistics process flexibility, order fulfillment and information sharing as the gauge of supply chain performance.

Review of Previous Empirical Studies

Palo-Sanchez, Arenas-Marquez and Camacho [4] precisely verified the implementation of software mock-up in organizations by accomplishing firm's operations. The study got hold of information from 150 companies in Andalusia, Spain. The study as well exposed the managerial requirements looked-for by these companies that imagined the accomplishment of a genuine replica coupled to cloud computing and practical for firm's procedures.

Kung, Cegielski, and Kung [1] premeditated how the ambient locale of a firm lends a hand in the target to implement software. The sample emanated from 357 respondents from preferred retail and manufacturing firms in the USA. The questionnaire managed, bestowed a rejoinder pace of 25%. The investigation originated a noteworthy unswerving and

interface end product manipulating SaaS adoption objectives in companies. Most considerably, the investigation exposed an alliance between mimetic pressure and perceived technology complexity.

Luoma [5] scrutinized competitive strength on the industry replicas of SaaS by means of 500 respondents and institute that uniformly, software product companies who utilize enthusiastically, schemes that are cost proficient and responsive are focused on computing expertise and polarizing prerequisites, to advance into SaaS companies. The work discovered that both brands of the SaaS companies are taking up parallel software structural design, crosswise a number of end-users and shifting their practice and structure to support instantaneous adjustments revenue SaaS companies, relying on company's option to set off the length of cost competence of the buyer familiarity advance.

Benlian and Hess [15] studied and made a distinction between SaaS adopters and non-adopters. Affixed on distinguished risk theory, the investigation put together a exploration representation that was evaluated with assessment facts hauled out from 379 companies in Germany. These companies embraced manufacturing, wholesale and retail trade, financial intermediation, TIME industries, construction and real estate, logistics, public and healthcare, electricity (gas), and water supply. The research employed a feedback form and investigation. Examination of facts was performed by means of PLS-based water structural equation modeling founded on SmartPLS. The results discovered that SaaS clients possibly will make use of more skillfully SaaS-based offerings.

Benlian, Koufaris and Hess [16] experimentally looked at the software quality and dependable software handling. Making use of the major respondents' method, the connection in the midst of the study variables was evaluated with the SmartPLS. It was exposed that, a significant outcome do not subsist among SaaS quality and SaaS continuance intention. More to the point, responsiveness and security/privacy are the nearly all decisive aspects that take part in transporting SaaS service quality on satisfaction and perceived usefulness.

Theoretical Perspective

In this study, the underpinning for understanding the force of software as a service on supply chain performance was found in the diffusion of innovation theory (DIT), a well-known presumption on technology approval writings with the objective of explaining how radiating technologies are drawn out and running in business. The weak spots viewed in diffusion innovation theory are that equivalent stance positioned in diffusion innovation theory is diminutive of rational rationalization. What's more, diffusion of innovation was not talented to correlate the modernization with apposite outlook [17]. On the other hand, the sphere of information systems encloses several up to date diffusion of innovation interconnected investigations [18]. This is practical to the paper as it establishes how the retail petroleum marketing firms distinguish the relative advantage in diffusion of innovation theory. Accordingly, retail petroleum marketing companies stand to gain if they accept modernization by get hold of favourable SaaS acceptance devices.

From the review of literature, the following hypotheses were formulated:

- H₀₁:** Software as a service does not enfold considerable and optimistic force on logistics process flexibility.
- H₀₂:** Software as a service does not enfold considerable and optimistic force on order fulfillment.
- H₀₃:** Software as a service does not enfold considerable and optimistic force on information sharing

3. RESEARCH METHODOLOGY

An investigation instrument was developed to explore software as a service and supply chain performance. The survey instrument was pre-tested quite a lot of times to certify that the wordings, design, and continuation of questions were apposite. Information for the study was composed through a questionnaire that was disseminated to 220 retail petroleum marketing firms' managers inside the city of Port Harcourt in Nigeria. The sample was preferred through the random sampling technique from the catalog of the Business Registration Directorate of Rivers State, Nigeria. The sampling frame consists of 55 retail petroleum marketing companies. Of the 220 questionnaire disseminated, an entire 202 questionnaire were returned. An overall of 10 questionnaires were not needed owed to inaccurate treatment, misplaced as well as dismembered facts in the respondents' silhouette. Taken as a whole, response rate was 95.3 percent which was well thought-out as fitting for successive investigation.

4. RESULTS AND DISCUSSION

Test of Hypotheses One

Table 1: Model 1 Summary

Model	R	R square	Adjusted Square	R std error of the Estimate
1	.956 ^a	.915	.914	.958

a. Predictors: (Constant), Software as a Service

b. Dependent Variable: Logistics Process Flexibility

The value of R is 0.956. The R value of 95.6% corresponds to the correlation amid software as a service and logistics process flexibility. It signifies as exceptionally well-built correlation amid software as a service and logistics process flexibility. The R² is 0.915. This connotes that 91% of the transformation in logistics process flexibility is illuminated by the self-determining variable. It illustrates that software as a service composes an input of 91% to each transformation in logistics process flexibility, whereas 0.9% of the transformations are not illuminated.

Table 2: ANOVA for Model 1

Model	Sum of squares	Df	Mean square	F	Sig.
1 Regression	1959.262	1	1959.262	2145.274	.000 ^b
Residual	182.658	200	.913		
Total	2141.921	201			

a. Dependent Variable: Logistics Process Flexibility

b. Predictors: (Constant), Software as a service

The satisfactoriness of the model can as well be illuminated by the value 2145.274, (F-ratio) at $p < 0.05$. This entails that in attendance is confirmation to substantiate that software is linearly interconnected to logistics process flexibility. This put forward that the model is précised to be robust and that software has extensive pressure.

Test of Hypotheses Two

Table 3: Model 2 Summary

Model	R	R square	Adjusted Square	R std error of the Estimate
1	.962 ^a	.925	.925	1.146

a. Predictors: (Constant), Software as a Service

b. Dependent Variable: Order Fulfillment

The value of R is 0.962. The R value of 96% corresponds to the correlation amid software as a service and order fulfillment. It signifies as exceptionally well-built correlation amid software as a service and order fulfillment. The R² is 0.925. This connotes that 92% of the transformation in order fulfillment is illuminated by the self-determining variable. It illustrates that software as a service composes an input of 92% to each transformation in order fulfillment, whereas 0.8% of the transformations are not illuminated.

Table 2: ANOVA for Model 2

Model	Sum of squares	Df	Mean square	F	Sig.
1	Regression	3261.459	1	3261,459	2481.910
	Residual	262.818	200	1.314	
	Total	3524.299	201		

a. Dependent Variable: Order Fulfillment

b. Predictors: (Constant), Software as a service

The satisfactoriness of the model can as well be illuminated by the value 2481.910, (F-ratio) at $p < 0.05$. This entails that in attendance is confirmation to substantiate that software is linearly interconnected to order fulfillment. This put forward that the model is précised to be robust and that software has extensive pressure.

Test of Hypotheses Three

Table 5: Model 2 Summary

Model	R	R square	Adjusted Square	R std error of the Estimate
1	.911 ^a	.830	.829	1.643

a. Predictors: (Constant), Software as a Service

b. Dependent Variable: Information Sharing

The value of R is 0.911. The R value of 91% corresponds to the correlation amid software as a service and information sharing. It signifies as exceptionally well-built correlation amid software as a service and information sharing. The R² is 0.830. This connotes that 83% of the transformation in information sharing is illuminated by the self-determining variable. It illustrates that software as a service composes an input of 83% to each transformation in information sharing, whereas 0.17% of the transformations are not illuminated

Table 6: ANOVA for Model 3

Model	Sum of squares	Df	Mean square	F	Sig.
1 Regression	2637.383	1	2637.388	977.117	.000 ^b
Residual	539.829	200	2.699		
Total	3177.213	201			

a. Dependent Variable: Information Sharing

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

The satisfactoriness of the model can as well be illuminated by the value 977.117, (F-ratio) at $p < 0.05$. This entails that in attendance is confirmation to substantiate that software is linearly interconnected to information sharing. This put forward that the model is précised to be robust and that software has extensive pressure.

Deeply, software is a far-reaching dynamic or verifier of performance. Software as a Service in augmenting supply chain performance ought to be managed properly. Plainly, software as a service manipulates logistics process flexibility, order fulfillment and information sharing. For that reason, end results on software as a service and logistics process flexibility endorsed the substitute hypothesis that software as a service appreciably manipulates logistics process flexibility. The investigation dealt with subject on the exploitation of software as a service in managing complimentary supply chain performance in companies. Accomplishing competitive advantage is evaluated by supply chain performance such as logistics process flexibility. Software as a service has profound derivation in manufacturing where invention blueprint can be reduced in cloud computing overhaul and held fittingly. Commencing our discovery, we comprehend that software extends optimistically on logistics process flexibility. Our discovery affords sustenance to Kung, Cgielski and Kung [1] declaration that shared or mutual outcomes subsist in a company's adoption ambitions.

The investigation additionally unearths that software as service appreciably manipulates order fulfillment, such that the more a company hold close software as a service, the more the completing of order. This illustrates that software as a service is a foremost mover of order fulfillment. It is no marvel that an assortment of studies in this quarter such as ([19]. [20]. [21], [2]), whose inquiries bring into being alliance involving software as a service and performance.

The investigation as well uncovers a considerable manipulation of software as a service on information sharing. This entails that as software as a service augments, information sharing also augments. This as well have a propensity to designate that SaaS as a spring of technology has been of enormous assistance to retail petroleum marketing firms and no marvel they persists in composing exertions to uphold its exploit. The noteworthy control as established by the diverse analysis as well substantiates the magnitude of software to retail petroleum marketing firms information sharing. The results sustain the inquiry of Cao etal. [22], who bring into being alliance linking cloud computing and information sharing.

5. CONCLUSION AND IMPLICATION

This study demonstrates unmistakably that SaaS propels optimal performance of retail petroleum marketing firms. That is, emphasis on the use of software as a service in supply chains is critical to enhancing supply chain performance. Understandably, it is of essence to declare that SaaS has the prospective en route for perking up logistics process flexibility, order fulfillment and information sharing just before attaining considerable performance. Therefore, the paper concludes that software as a service is an antecedent to improved supply chain performance.

Managerial Implication

The broad implication is that while it is essential to embrace SaaS, retail petroleum marketing firms must strive to boost its effect on performance in business, so as to make a difference and enhance competitive advantage in the market place.

6. RECOMMENDATION

Retail petroleum marketing firms should focus strategically on software as a service to initiate superior supply chain performance.

7. Limitation and Future Research Direction

This study borders specifically on retail petroleum marketing industry. Further research can be carried out in upstream sector to validate outcome of this study.

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