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Effect of Entrepreneurial Orientation on Product and Service Quality of Indigenous Oil and Gas Service Firms in Selected South-South, Nigeria

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ABSTRACT

This study examined the effect of entrepreneurial orientation on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria. The study adopted descriptive cross-sectional survey research design. The study was based on specific research objective, question and hypothesis aligned with the research problem. The instrument of data collection was a self-developed 5-points Likert scale questionnaire. The population was 1827 indigenous oil and gas service firms in selected South-South States, Nigeria obtained from Nigerian Content Development and Monitoring Board (NCDMB) approved register. The study sample size was 328 determined with Taro Yamane's formula for sample size determination and proportionally allocated using Bowley's formula. Microsoft Excel Software Package (version 2016) and International Business Machine Statistical Packages for Social Sciences (IBMSPSS) version 29 software application tools were used to compute results obtained to aid in making inferences on the data. The results of regression analysis showed that entrepreneurial orientation in business strategy and operational systems significantly and positively affect product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria. The study concludes that entrepreneurial orientation in business strategy and operational systems improved product and service quality outcomes of indigenous oil and gas service firms in South-South States, Nigeria.

Key words: Business Strategy, Entrepreneurial Orientation, Oil and Gas Services Ecosystem, Operational Systems**,** Product and Service Quality, South-South States.

1. INTRODUCTION

The competitive landscape of the 21st century present firms with new fundamentals like globalization or global marketplace coupled with significant volatility, uncertainty, complexity and ambiguity in predicting the future. To successfully cope with these new realities, firms are expected to develop strategic alternatives with which they can proceed for desired outcomes [1]. Local entrepreneurial firms in Nigeria's oil and gas sector especially indigenous oil and gas service companies need effective and efficient business strategy and operational systems to survive in the competitive environment. Achieving operational excellence and competitiveness in today's complex, unpredictable and competitive business environment puts immense pressure on products and services-oriented organizations with limited resources to pursue superior operational performance in terms of product and service quality, cost reduction by optimization and provide high-quality products and services in shorter lead times to their esteemed customers [2]. As stated by [3] cited in [4], new research gaps can be identified and developed based on evidence, knowledge, methodology, scope, theories, and population gaps. The researchers have established gaps in terms of study concept, methodology (research design, population, sample size and sampling techniques, data classification and analytical techniques), scope (content, geographic coverage and unit), and empirical studies. These identified gaps in literature are what the present study seeks to fill by proffering innovative and feasible solutions, make valuable contribution to the body of knowledge with practical policy implication for implementation. Therefore, to comprehensively address these research gaps, this study examined the effect of entrepreneurial orientation in business strategy and operational systems shortened as entrepreneurial orientation on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria.

Problem Statement

Most indigenous oil and gas service firms have weak capacity in their administrative and decision-making processes, inadequate formulated and implemented business and operational systems strategy, inability to launch new corporate

ventures, low levels of competitiveness, high failure rates, difficulty in maintaining and improving operations and business performance. Also, weak governance practices, poor business performance, monumental frauds and catastrophic failures are common features of these firms. Many indigenous oil and gas services entrepreneurs or business people awarded contracts abuse the opportunity, ruining future tenders due to weak corporate governance. Some of these firms go as far as mismanaging the initial mobilization funds released to them after winning contracts. These mobilization funds are meant to cover costs of the products and services that a specific company is expected to deliver as specified in the contract.

Research Objective

This study specifically examined the effect of entrepreneurial orientation on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria.

Research Question

To what extent does entrepreneurial orientation affect product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria?

Research Hypothesis

H_0: Entrepreneurial orientation does not significantly affect product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria.

The remainder of this paper is structured as follows: Section 2 reviews literature while, Section 3 discusses research method, Section 4 presents results and discussions, Section 5 contains conclusion and recommendations, Section 6 explains research implications, limitations and suggestions for future studies.

2. LITERATURE REVIEW

Conception Review

Entrepreneurial Orientation

Entrepreneurial orientation is defined as firm level strategic orientation which captures an organization's strategy making practices, managerial philosophies and firm behaviours that are entrepreneurial in nature [5]; [6]. As stated by [7] entrepreneurial orientation is the administrative and decision-making activities which would lead to some new developments in small and medium size business like the indigenous service firms operating in Nigeria's oil and gas sector.

Furthermore, entrepreneurial orientation has created positive impact in the overall organizational performance of SMEs businesses [8]; [9]. Entrepreneurial orientation refers to the process, practices and decision-making activities that lead to the development and delivery of new and innovative products or services that can differentiate a firm from others in the market [5]; [10]. Entrepreneurial orientation is also seen as the entrepreneurial strategy making process used by decision makers to endorse their firms organizational purpose, sustain its vision and create competitive advantage. Entrepreneurial orientation is the rules and norms used for decision-making.

Additionally, [11] defines entrepreneurial orientation as a firm's strategic orientation of capturing specific aspects of decision-making styles, methods and practices all of which indicate the entrepreneurial posture of the firm which in turn enhances overall performance. Entrepreneurial orientation focuses on the processes and styles of strategy development, characterizes a firm's entrepreneurial behaviour that make firms' have the tendency to innovate, take risks and become proactive so as to achieve overall performance [12]; [13]. Entrepreneurial orientation is a key ingredient for attaining and sustaining organizational performance [14]. Entrepreneurial orientation enables firms to undertake uncertain and risky investments and proactively reach markets ahead of their competitors thereby realizing high returns [15]. Also, studies carried out by [16] and [17] described entrepreneurial orientation as important phenomenon that plays a crucial role in aligning business to market demands and performance. Another study by [18] showed that firms with entrepreneurial orientation do possess the ability to discover and exploit new market opportunities. These firms can respond to challenges effectively and prosper in a competitive and dynamic environment [19]; [20]. [21] found that entrepreneurially oriented firms possess capabilities that enable them to innovatively reconfigure their resources and practices from time to time in order to proactively capture changing market opportunities.

Therefore, entrepreneurial orientation generally involves a willingness to innovate, engage in risky exercises, take self-directed actions and be more proactive and aggressive in exploiting new opportunities in the marketplace [22]. Also studies have shown that firms with entrepreneurial orientation in business strategy and operational systems can respond to challenges effectively, grow faster and prosper in a competitive and dynamic environment [6]. This study conceptualized entrepreneurial orientation as a construct of innovativeness, risk-taking, pro-activeness, competitive aggressiveness and autonomy.

Product and Service Quality

Product and service quality is the capacity of a given product or service to perform a given task which may include characteristics such as longevity, dependability, accuracy in the results, ease of use and maintenance, and other very important overall product and service qualities [23]. Product and service quality is determined by how closely they adhere to standards. The caliber of product and service quality offered by any business might assist the customers form favourable opinions on the product or service resulting to customers' satisfaction and loyalty.

The International Organization for Standardization (ISO) 9001:2015 Quality Management System (QMS) certification is a demonstration of a firm's management system conformity

to internationally acceptable standard requirements and the ability of the firm to get it right the first time and every time. The ISO 9001:2015 QMS provide firms with the frameworks to satisfy their customers and retain their loyalty for sustainable performance. The ability of firms to formalize their operational policies and systems by documenting processes, procedures, and responsibilities for achieving product and service quality goals recommended by the standard will strengthen their process effectiveness, efficiency, organizational culture and regulatory compliance. It will optimize the efforts for continual improvement with the adoption of data-driven and evidence-based decision-making process to ensure customer satisfaction.

Quality management practices are considered to play an important role in operational performance. The results of effective quality management systems are also shown at the operational levels. Product and service quality is defined as the degree to which a set of inherent characteristics fulfils needs and exceeds expectations of customers in the market place [24]. Product and service quality has emerged as a strategic entity making quality management system a necessity for operational performance and global competence [25]. Product and service quality has been defined in different ways by scholars. To some scholars, product and service quality is the conformance to standards while to others, it is seen as being consistent in the provision of products and services that satisfy and exceeds customers' requirements and expectations rather than only minimizing defects and conforming to specifications with any clear market-oriented continuous improvement strategy.

Therefore, this study conceptualized product and service quality as a construct measured with these indictors of quality management practices, ISO 9001:2015 QMS certification, reliability, corrective action mechanisms, preventive action mechanisms, and continuous improvement mechanisms.

Theoretical Review

Contingency-Based Theory

The development of the contingency approach also known as the best-fit theory in management practices and studies was stimulated by managers, consultants and researchers who tried to apply the principles of the major schools of management sciences in real-life situations. In most cases, they discovered that methods that were highly effective in one situation would not in other situations. They often found that a technique that works in one case may not necessarily work in all other cases because of differences in their respective situations. They then searched for an explanation for these experiences which gave rise to contingency based theory or best-fit theory [26] cited in [27]. Contingency based theory is of the idea that there is no single best approach to manage organizations. Organizations should then develop managerial strategy based on their situations including the culture, operational processes and external environmental conditions they are experiencing. The theory tries to identify and measure the conditions under which things will likely occur. Since human service practice varies substantially, contingency theory offers a useful approach to model and predict contingent situations. Contingency theory allows one to analyze a situation and determine what variables influence the decision with which you are concerned.

However, one criticism often levelled against contingency theory is that it tends to over simplify organizational reality. In efforts to relate one dominant variable of the organization (for example, compete on innovation or quality or cost) to another internal variable, they tend to assume a linear non-probability relationship [28]. According to Purcell [29] cited in [28] contingency based theory is limited by the impossibility of modelling all the contingent variables, the difficulty of showing their interconnection, and the way in which changes in one variable have an impact on others, i.e., how changes in internal environment is connected to changes in external environment. The contingency theory also lacks emphasis on the internal context of individual businesses within the same sector and the unique characteristics and practices that may provide its main source of sustainable competitive advantage. Despite its criticisms and limitations, contingency-based theory was found valuable in this study in explaining the effect of entrepreneurial orientation on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria.

Strategic Intelligence

Strategic intelligence theory contends that if an individual knows how an opponent performs on one task, then, it is easy to manipulate the next activity's outcome. In other words, it is a stimulus-response theory which has its origin from military setting. The theory is associated with the ability to produce variety of ideas, innovative solutions, render judgements and make intellectual decisions whether correct or wrong [30] cited in [31]. It is the ability to formulate new ideas combined with related facts or information and experiences. Strategic intelligence in business is a cognitive skill of ethical collection of market competitive insights while systematically analyzing the environment [32]. Strategic intelligence is the ability to identify the strengths, weakness, opportunities and threats, and further identify the intentions of competitors, employ preventive measures where actual threats or potential threats exist and capture the potential opportunities. Thus, strategic intelligence is the ability to establish secrets of a competitor [33] cited in [31]. It helps to shape efforts to lead the firm to higher standing and performance, provides alerts on competitive ranges, and focus on longer horizons of firm performance, differentiating it from tactical intelligence [34]. Strategic intelligence is the ability to predict, find, combine analytical skills and solve business problems while anticipating competitor's behaviour and pre-empt it [35].

However, the theory has been criticized in that, though prediction may result to positive outcome, uncertainty is often vast, innovation is continuous, thus the best option should be to prioritize and try to achieve own objectives. Irrespective of it criticisms and limitations, strategic intelligence theory is valuable to the current study in explaining the effect of entrepreneurial orientation on product and service quality of

indigenous oil and gas service firms in selected South-South States, Nigeria. Though, the contingency-based theory and strategic intelligence theory were reviewed in support of this study, its theoretical foundations and concepts was mainly anchored on contingency-based theory.

Empirical Review

Entrepreneurial Orientation and Product and Service Quality

[36] using cross-sectional quantitative and descriptive research approaches analyzed the influence of entrepreneurial orientation, learning orientation and dynamic capability on strategic flexibility and SMEs performance in Indonesia's Island of Java creative sector. The study used a sample size of 119 respondents with purposive sampling technique of SMEs and data collected through the distribution of copies of well-structured 6-point Likert scale questionnaire. The data obtained were analyzed using descriptive and inferential statistics in Partial Least Squares structural equation modelling tool SmartPLS (SEM-PLS). The results showed that entrepreneurial orientation, learning orientation and dynamic capabilities all had positive and significant influence on strategic flexibility while strategic flexibility in turn had a positive and significant influence on financial performance and innovation performance of SMEs. Also, the study findings indicated that innovation performance positively and significantly mediated the relationship between strategic flexibility and financial performance of SMEs. The study recommended that SMEs owners should focus on building flexible business structures, processes, and systems that can adapt to changes in the environment to quickly reorganize and take advantage of new opportunities resulting to innovation and improved performance.

[37] adopting a cross-sectional survey research design examined the effect of entrepreneurial orientation on the operational performance of registered poultry farms in Kaduna Metropolis, Kaduna State, Nigeria. The study used copies of structured questionnaire to obtain data from a sample size of 476 poultry farmers in Kaduna Metropolis. Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 2.0 software application path modelling was used to analyze the data. The result showed that entrepreneurial orientation dimensions of pro-activeness, innovativeness and risk-taking had significant positive effect on operational performance of registered poultry farms. The study recommended that poultry farmers should make minor adjustments to their products in order to improve their operational performance.

[38] using a case study survey research design empirically determined the influence of entrepreneurial orientation on leadership style, flexibility and technology adoption on perceived success among employees of Xpeng Motors, Guangzhou, China. The study used a sample size of 286 respondents determined with Taro Yemane's formula drawn from a population of 1000 employees at Xpeng Motors. Questionnaire distributed online through email was used to obtain data from the respondents. The data were subjected to both descriptive and inferential analysis in Statistical Package for Social Sciences (SPSS) version 23.0 software application. The study findings showed that there is a significant positive relationship between entrepreneurial orientation and employee success among employees of Xpeng. In specific terms, the study found that innovativeness, risk-taking, and pro-activeness have a positive correlation with employees' perceptions of their own success. This suggests that employees who perceive their employer to be more entrepreneurial, innovative, risk-taking, and proactive are more likely to experience greater levels of job success. The outcome of the research hypotheses testing further confirmed these findings by demonstrating the positive correlations between entrepreneurial approach and leadership style, flexibility, and technology adoption, all which impact employee success in turn. The study recommended that managers of organizations should promote entrepreneurial orientation practices within the organizations which would have positive effects on the success of their employees.

[39] adopting a survey research design empirically investigated the influence of entrepreneurial orientation and entrepreneurial culture on performance of small and medium-scale enterprises in Calabar Metropolis, Cross River State, Nigeria. The study was anchored on resource-based theory (RBT). The study used a sample size of 400 employees statistically determined with Taro Yamane's formula drawn from a population of 1294 employees. The study quantitatively generated data through the distribution of copies of structured questionnaires to respondents selected using purposive sampling method. The research questionnaire was tested for reliability using Cronbach's Alpha coefficient. The study employed multiple linear regression analysis techniques in testing the research hypotheses. The study findings revealed a positive relationship between entrepreneurial orientation and growth of small and medium-scale enterprises while entrepreneurial culture showed a negative effect on profitability of small and medium-scale enterprises in Calabar Metropolis. The study recommended that the small and medium-scale enterprises owners/managers should continuously incorporate new decision-making strategies, procedures and behaviour that will put the organization into an advantageous position when entering new or established markets with new or existing products and services. Also, it recommended that entrepreneurial culture should be strengthened by owners/managers of small and medium-scale enterprises in pursuit of their firms' performance as well as yielding to the economic growth.

Again, [40] using a cross-sectional survey research design examined the relationship between entrepreneurial orientation and market share of selected quoted consumer goods manufacturing companies in Nigeria. The sample size used was 494 respondents determined by applying the [41] formula and increased by 30% (130) of the total sample which brought the sample size to 563 as recommended by [42]. The total sample size was drawn from a population of 1551employees in selected 12 quoted consumer goods manufacturing companies

in Nigeria. The researchers used a self-developed structured and validated questionnaire to obtain data from respondents which consisted of top management and functional managers through a multistage sampling technique. The data were analyzed using descriptive and inferential (multiple and hierarchical regression analysis) statistics. The research findings revealed that the entrepreneurial orientation dimensions comprising of innovativeness, competitiveness, aggressiveness, pro-activeness, risk-taking and planning flexibility had significant influence on market share of selected quoted consumer goods companies in Nigeria. The study recommended that managers of consumer goods manufacturing companies should practice entrepreneurial orientation principles to be proactive and competitive enough to further boost their market position.

Also, [43] using a cross-sectional survey research method empirically investigated the relationship between entrepreneurial orientation and supply chain performance among small and medium-sized enterprises in south-south geopolitical region of Nigeria. The study used a sample size of 128 respondents made of SMEs supply chain executives purposively selected from a population of 756 SMEs. A 5-point Likert scale structured questionnaire was utilized in obtaining data from the respondents. The data were subjected to both descriptive statistics (mean and standard deviation) and inferential statistics (Pearson's Product Moment Correlation Coefficient and Multiple Linear Regression Analysis. The validity and reliability tests of Cronbach's Alpha coefficient and composite reliability respectively were performed on the questionnaire. The study results showed that all the entrepreneurial orientation components of innovativeness, risk-taking and pro-activeness had strong and positive relationship with the measures of supply chain performance among small and medium-sized enterprises in south-south, Nigeria. The study recommended that small and medium-sized enterprises should be encouraged to regularly review their entrepreneurial commitment and make the necessary adjustments and renewal where necessary.

Meanwhile, according to the study carried out by [44] adopting quantitative approach with a descriptive survey research design empirically examined the moderating effects of entrepreneurs' demographic characteristics on strategic entrepreneurial orientation and competitiveness of agro-based SMEs firms in Lagos and Ogun States, Nigeria. In line with the objectives of the study, a sample size of 159 respondents in agro-based SMEs was selected using the combination of convenience, purposive and stratified sampling techniques. Data gathered from the respondents which consisted mainly of owners/managers of micro, small and medium-sized agro-based firms randomly selected and surveyed through the use of a 5-point Likert scale structured questionnaire. Hierarchical multiple regression was adopted in analyzing the research instrument. The reliability of the research items was ensured using the internal consistency method while the validity of scale items was carried out using construct validity based on correlation that revealed convergence and discriminant validity among research scales. The tests of reliability and validity, and data analysis of descriptive and inferential statistics were carried out using Statistical Package for the Social Sciences (SPSS) version 22.0 software application. The study findings showed that strategic entrepreneurial orientation are significant to achieving and enhancing competitiveness of agro-based SMEs in Lagos and Ogun States, Nigeria. In specific terms, the research results revealed that strategic entrepreneurial orientations such as analysis, future oriented strategies, proactive initiatives, risk-taking attitudes, defensiveness were significant indicators of business, operational and financial competitiveness and new product development of the organization. The study findings as well established that entrepreneurs' demographic characteristics, especially gender, age grouping, work experience and educational qualification significantly moderated the relationship between strategic entrepreneurial orientations and competitiveness of agro-based SMEs in Lagos and Ogun States, Nigeria. The researchers recommended that SMEs operators should pay attention to developing competencies in strategic entrepreneurial orientation such as analysis, future oriented strategies, proactive initiatives, risk-taking attitudes, defensive strategies over their niche by ensuring integration of their various functional units to enhance new product development efforts, business competitiveness, financial positions and operational competitiveness. The study as well recommended that entrepreneurs should give attention to industries that support their demographic characteristics especially with respect to gender, age categorization, work experience and educational qualification.

[45] using a quasi-experimental cross-sectional survey research method empirically investigated the relationship between entrepreneurial orientation and organizational survivability as well as the mediating role of human capital management of commercial banks in Rivers State, Nigeria. The study used a sample size of 144 members obtained using [46] sample size table drawn from a population of 240 top level management personnel in all the 24 commercial banks head office or main branches within Rivers State, Nigeria. Purposive sampling technique was used in selecting 6 respondents from each bank's head office or main branch which focused on managers of these departments: human resources, research and data service, marketing, financial services, information and technology, and accounting department. The data were generated by the use of a 5-point Likert scale structured questionnaire personally administered by the researchers. The reliability of the research instrument was determined by Cronbach's Alpha coefficient test. The data were analyzed in four major phases: the demographic, univariate, bivariate and multivariate descriptive and inferential statistics. The research findings showed that all the three dimensions of entrepreneurial orientation used which were innovativeness, pro-activeness and risk-taking were found to be significantly associated with organizational survivability. Again, the results revealed that human capital management partially and significantly mediated the relationship between entrepreneurial orientation and organizational survivability. The study recommended that

commercial banks should imbibe an attitude of openness to change through flexible service systems and service delivery processes. The study as well recommended that commercial banks work patterns, systems and structures should be made permeable enough to allow for the flow of new ideas to foster improved operational standards. The study recommended that creativity should be encouraged among staff through support systems which celebrate suggestions, inputs and quality contributions based on experience, skill and knowledge. The study equally recommended that commercial banks employees should be recognized and treated as the only resource with the potentials to expand or shrink output at will depending on their mindset.

3. RESEARCH METHOD

The study adopted descriptive cross-sectional survey research design [47]. This research design was premised on the previous works of [36]; [37]; [40]; and [43].

Population and Sampling

The population of the study was 1827 indigenous oil and gas service companies in Nigeria obtained from Nigerian Content Development and Monitoring Board (NCDMB) approved register. The number of indigenous oil and gas service companies in each of the four selected South-South States were as follows: Akwa Ibom 138, Bayelsa 201, Delta 316 and Rivers 1172. The sample frame used in this study was management level positions with appropriate knowledge and experience in oil and gas services business strategy, management and operational systems in each of the firms studied.

Sample Size Determination and Allocation

The study sample size was 328 determined with Taro Yamane's formula for sample size determination while Bowley's formula was used to proportionally allocate the sample size in the selected South-South States in Nigeria.

Taro Yamane's formula is: $n = N/[1 + N(e^2)]$ (3.1)

Where: n = Sample size, N = Population of the study, e = The margin of error. Therefore, substituting N = 1827 and e = 0.05 into the stated formula gives: $n = 1827/[1 + 1827(0.05^2)] = 328$.

Bowley's statistical formula is: nh = nNh/N (3.2)

Where: n = Total sample size; nh = Proportional sample size; Nh = Population of each stratum; N = Total population of the study.

Substituting n = 328, N = 1827 and Nh value for each stratum or selected state into the stated formula gives: Akwa Ibom State: nh = nNh/N = (328 x 138)/1827 = 25; Bayelsa State: nh = nNh/N = (328 x 201)/1827 = 36; Delta State: nh = nNh/N = (328 x 316)/1827 = 57; Rivers State: nh = nNh/N = (328 x 1172)/1827 = 210.

Research Instrument

The study which was at the organizational unit of analysis used a self-developed 5-points Likert scale questionnaire as instrument of data collection from management level respondents. The questionnaire was validated and reliability of the study variables established. The construct and content validity were ascertained through checks and corrections from senior academics and research experts in the fields of strategic management, entrepreneurship, innovation, and management technology who ensured the statements in the questionnaire measured the study variables.

Table 1: Reliability and Validity Tests Results

					Reliability	**Validity**					
S/No	**Variables**	**Variables Code**	**Number of Items**	**Number of Respondents**	**Cronbach's Alpha**	**Pearson's r Count**	**Pearson's r Table 5% (292 - 2)**	***P*-Value**	**KMO**	**Bartlett's Test of Sphericity**	**Sig.**
1	Entrepreneurial Orientation	EO	5	292	0.84	0.565	0.195	0.000	0.822	642.104	0.000
2	Product and Service Quality	PSQ	5	292	0.77	0.550	0.195	0.000	0.757	375.162	0.000

Source: IBMSPSS 29 Output, 2025

Reliability and Validity Tests Results

Table 1 shows reliability test results of the study variables based on Cronbach's Alpha coefficient. As stated by [48] cited in [49], if Cronbach's Alpha test result ≥ 0.7, the reliability is considered high; if Cronbach's Alpha test result ≥ 0.5, the reliability is acceptable; if the Cronbach's Alpha test result ≤ 0.5, the reliability is considered poor. The Cronbach's Alpha coefficient values were all greater than 0.7. Thus, the results were acceptable as per the threshold given by [50] cited in [51]; [52] who stated that Cronbach's Alpha coefficient

greater than or equal to 0.7 is acceptable for basic and advanced research. This shows that the Likert scale questionnaire items and statements have high reliability as the Cronbach's Alpha values were all higher than the recommended and acceptable values of ≥ 0.5 and ≥ 0.7. Meanwhile, [53] explained that reliability can be seen from two sides: reliability (the extent of accuracy) and unreliability (the extent of inaccuracy).

Table 1 also shows construct validity test results for each variable of the study based on Pearson's r in IBMSPSS version 29. The basic decision rules for construct validity test with Pearson's r were as follows: Comparing the values of Pearson's r count with Pearson's r table. If the value of r count > r table, test result is valid and if the value of r count < r table, test result is invalid. Again, taking decision based on the result of the significance (sig) or probability value (p-value), if the significance value or p-value < 0.05, test result is valid while if the significance value or p-value > 0.05, test result is invalid. The construct validity test result based on Pearson's r table with total sample size N = 292 at 0.05 level of significance and a degree of freedom of N – 2 i.e. r table at 5% (292 – 2) value = 0.195 shown in table 2 were valid for all the study variables. Again, factor analysis was used to test construct validity of the research instrument by using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of Sphericity with interpretive adjectives. The KMO decision criteria were stated as follows: KMO value less than 0.5 is considered poor; KMO value between 0.5 and 0.6 is considered average; KMO value between 0.7 and 0.8 is considered good; KMO value more than 0.8 is considered excellent [54] cited in [51]; [52]. The KMO value for each variable was greater than 0.5 meaning that the questions actually measured the variables of the study. Similarly, Bartlett's test of Sphericity test whether the correlation matrix among the variables is an identity (where the diagonal values is 1, and the off-diagonal values is 0) with the level of significant in this case p-value of the test less than 0.05. Bartlett's test of Sphericity value for each study variable has 0.000 significance which is less than 0.05 level of significance indicating no significant correlations among the variables. Therefore, KMO and Bartlett's test of Sphericity results indicated that statements that comprised the research instruments of each variable actually measures what were intended to be measured.

Simple Linear Regression Analysis Model Specification

To examine the effect of entrepreneurial orientation on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria, a simple linear regression empirical model was formulated based on the research hypothesis as follows:

$$Y = f(X) \quad (3.3)$$

$$Y = \beta_0 + \beta_i X_i + \mathcal{E}_0 \quad (3.4)$$

$$PSQ = \beta_0 + \beta_i EO_i + \mathcal{E}_0 \quad (3.5)$$

Y = Dependent variable (Product and Service Quality of Indigenous Oil and Gas Service Firms in selected South-South, Nigeria); β_0 = The intercept of the simple linear regression model was interpreted as the mean response when the value of $X_i = 0$ i.e., a constant in the model; β_i = The slope of the simple linear regression model was interpreted as the change in the mean response when the value of X_i increases by one unit; X_i = Independent variable (Entrepreneurial Orientation); $\mathcal{E}_0$ = Random error term.

The Analysis of Variance (ANOVA) revealed the overall explanatory power of the study model. The ANOVA formula is given as:

$$F = MSE/MST \quad (3.6)$$

Where: F = ANOVA coefficient or F- statistic or F-ratio; MST = Mean sum of squares due to treatment; MSE = Mean sum of squares due to error [55]; [56].

4. RESULTS AND DISCUSSIONS

Results

Questionnaire Response Rate and Demographic Information

A total of 328 copies of questionnaire were administered to management level respondents in sampled indigenous oil and gas service firms, out of which 292 representing 89% were retrieved from the field work and found useable for data analysis. However, 36 copies of the questionnaire representing 11% were found unfit for data analysis because they were either not properly completed or not retrieved from the field. Therefore, the response rate of 89% was found adequately good for the purposes of data analysis in this study, thereby meeting the threshold of [57] and [58] cited in [51]; [52] who posited that a response rate of above 50% is adequate for descriptive and inferential analysis in social science research.

Also, the analysis of demographic information showed that 210 respondents were males representing 72% of the total the total respondents while 82 respondents were females representing 28% of the total respondents. Since the respondents in this study were management level employees in the sampled firms, this shows that there were more male employees in management level positions than their female counterparts in most indigenous oil and gas service firm companies in Nigeria. This means that the female gender group is under represented in management level positions in these firms.

Table 2 shows the descriptive statistics of entrepreneurial orientation with grand mean and standard deviation values of 4.4527 and 0.6452 respectively meaning that the respondents' opinions were not significantly different from the mean values.

Table 3 shows the descriptive statistics of product and service quality with grand mean and standard deviation values of 4.5411 and 0.5394 respectively meaning that the respondents' opinions were not significantly different from the mean values.

Table 2: Descriptive Statistics of Entrepreneurial Orientation

S/No	Items Code	Entrepreneurial Orientation	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	Number of Respondents	Mean	Standard Deviation
1	EO1	Innovativeness	0 (-)	4 (1.4)	20 (6.9)	145 (49.7)	123 (42.1)	292	4.3253	0.6635
2	EO2	Risk-taking	4 (1.4)	2 (0.7)	8 (2.7)	143 (49.0)	135 (46.2)	292	4.3801	0.7054
3	EO3	Pro-activeness	2 (0.7)	6 (2.1)	5 (1.7)	131 (44.9)	148 (50.7)	292	4.433	0.6834
4	EO4	Competitive Aggressiveness	3 (1.0)	2 (0.7)	4 (1.4)	120 (41.1)	163 (55.8)	292	4.5223	0.6176
5	EO5	Autonomy	0 (-)	1 (0.3)	7 (2.4)	99 (33.9)	185 (63.4)	292	4.6027	0.5559
Grand Mean and Standard Deviation Values									4.4527	0.6452

Source: Field Survey Data, 2025; Microsoft Excel, 2016 Output
Percentages in Parenthesis

Table 3: Descriptive Statistics of Product and Service Quality

S/No	Items Code	Product and Service Quality	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)	Number of Respondents	Mean	Standard Deviation
1	PSQ1	ISO 9001:2015 certification	2 (0.7)	3 (1.0)	4 (1.4)	137 (46.9)	146 (50)	292	4.4658	0.5823
2	PSQ2	Products and services reliability	2 (0.7)	0 (-)	4 (1.4)	128 (43.8)	158 (54.1)	292	4.5308	0.5267
3	PSQ3	Preventive action mechanisms	0 (-)	1 (0.3)	9 (3.1)	122 (41.8)	160 (54.8)	292	4.5308	0.5584
4	PSQ4	Corrective action mechanisms	1 (0.3)	2 (0.7)	4 (1.4)	120 (41.1)	165 (56.5)	292	4.5479	0.5319
5	PSQ5	Continuous improvement mechanisms	0 (-)	2 (0.7)	3 (1.0)	101 (34.6)	186 (63.7)	292	4.6301	0.4976
Grand Mean and Standard Deviation Values									4.5411	0.5394

Source: Field Survey Data, 2025; Microsoft Excel, 2016 Output
Percentages in Parenthesis

Table 4: Regression Results on the effect of Entrepreneurial Orientation on Product and Service Quality of Indigenous Oil and Gas Service Firms in Selected South-South States, Nigeria

No. of Respondents	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R	R^2	Adjusted R^2	F-Value	Sig.	Durbin-Watson
		B	Standard Error	Beta								
292	(Constant)	4.092	0.199		20.581	0.001	0.132	0.018	0.014	5.176	0.024	2.088
	Entrepreneurial Orientation	0.101	0.044	0.132	2.275	0.024						

Dependent Variable: Product and Service Quality

Source: Field Survey Data, 2025; IBMSPSS, 29 Output

Table 4 shows the summary of simple linear regression results on the effect of entrepreneurial orientation on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria. The results revealed that entrepreneurship orientation has significant effect on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria (ß = 0.101, t = 2.275, $p < 0.05$). The t-value shows that the coefficient of the model parameter is statistically significant ($p = 0.024$). The regression analysis results also revealed that the coefficient of relative effect ($R = 0.132$) shows that a weak and positive correlation exists between entrepreneurial orientation and product and service quality. The coefficient of determination $R^2 = 0.018$ indicates that 1.8% of the variation in product and service quality of indigenous oil and gas service companies in selected South-South States, Nigeria was explained by entrepreneurial orientation. The regression coefficient of entrepreneurial orientation was 0.101 which implies that a unit change in entrepreneurial orientation causes a positive change of 0.101units in product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria. Furthermore, table 4 shows the ANOVA result which revealed that the overall explanatory power of the model was considered statistically significant with the F-statistic value output of the regression analysis model reporting a p-value of 0.024 ($F = 5.176$, $p < 0.05$).

$$PSQ = 4.092 + 0.101EO + \mathcal{E}_0 \qquad (4.3)$$

Therefore, the null hypothesis H_0, which states that entrepreneurial orientation does not significantly affect product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria was rejected. Meanwhile, the alternate hypothesis H_a, which states that entrepreneurial orientation significantly affect product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria was accepted.

Discussions

Entrepreneurial Orientation and Product and Service Quality

The result of the descriptive statistics of the independent variable, entrepreneurial orientation in business strategy and operational systems shows that the grand mean was more than the benchmark value of 3.00 with grand standard deviation much less than 1, meaning that there were no significant variations in the respondents opinions from the mean while the descriptive statistics of the corresponding dependent variable, product and service quality shows that the grand mean was more than the threshold mean value of 3.00 and grand standard deviation was much less than 1, meaning that the variations in the respondents' opinions were small from the mean.

The regression result of the effect of entrepreneurial orientation on product and service quality found that indigenous oil and gas service firms that used entrepreneurial orientation approaches positively and significantly improved in their operational performance by a factor of 0.101 in product and service quality compared to those that adopted strategic management techniques. This result agrees with [36] who reported that entrepreneurial orientation had a positive and significant influence on financial performance and innovation performance of SMEs in Indonesia's creative sector. Also, this result was in accordance with the findings of [37] who established that entrepreneurial orientation dimensions of pro-activeness, innovativeness and risk-taking had significant positive effect on operational performance of registered poultry farms in Kaduna Metropolis, Kaduna State, Nigeria. Again, this result is in tandem with the findings of [38] who found that there is a significant positive relationship between entrepreneurial orientation and employee success among employees of Xpeng Motors, Guangzhou, China. This result is in accordance with the findings of [39] who established that a positive relationship between entrepreneurial orientation and growth of small and medium-scale enterprises in Calabar Metropolis. Moreover, this result is in tandem with the findings of [40] who found that the entrepreneurial orientation dimensions comprising of innovativeness, competitiveness, aggressiveness,

pro-activeness, risk-taking and planning flexibility had significant influence on market share of selected quoted consumer goods companies in Nigeria. Furthermore, this result agrees with the findings of [43] who established that all the entrepreneurial orientation components of innovativeness, risk-taking and pro-activeness had strong and positive relationship with the measures of supply chain performance among small and medium-sized enterprises in south-south, Nigeria. This result is also consistent with the findings of [44] who found that strategic entrepreneurial orientations such as analysis, future oriented strategies, proactive initiatives, risk-taking attitudes, defensiveness were significant indicators of business, operational and financial competitiveness and new product development of the organization. This result is in tandem with the findings of [45] who established that all the three empirical dimensions of entrepreneurial orientation used which are innovativeness, pro-activeness and risk-taking were found to be significantly associated with organizational survivability of commercial banks in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concludes that entrepreneurial orientation in business strategy and operational systems had significant positive effect on product and service quality of indigenous oil and gas service firms in selected South-South States, Nigeria.

Recommendations

i. Owners/Managers and employees of indigenous oil and gas service firms should always adopt entrepreneurial orientation approaches in managing their business strategy and operational systems as it was established to significantly and positively affect operational performance.

ii. Owner/Managers, new entrants, potential entrepreneurs and investors of indigenous oil and gas service firms should adopt and use strategic entrepreneurship as planning and forecasting techniques when developing business strategy and plans as it was discovered to significantly and positively influence operational performance.

6. RESEARCH IMPLICATIONS, LIMITATIONS AND SUGGESTIONS FOR FURTHER STUDIES

The results suggest that innovative hybrid approach of strategic entrepreneurship with entrepreneurial orientation in business strategy and operational systems can be an effective complement to conventional strategic management approach, mainly with Nigerian content as a management philosophy for project execution, first consideration of Nigerian goods and services, Nigerian content in bids evaluations and contracts awards, full and fair opportunity for Nigerians and Joint Qualification System (JQS) for indigenous oil and gas service firms. This could help the realization of one of the main strategic objectives of Nigerian Oil and Gas Industry Development (NOGICD) policy of creating opportunity and enabling business environment that promote sustainable development and growth of Small and Medium Enterprises (SMEs) oil and gas services ecosystem in Nigeria.

This study was limited in scope as it focused only on the indigenous oil and gas services firms in the sub-sector excluding the international oil and gas services firms (IOCs) in Nigeria.

Future research should be conducted in national oil and gas companies, local independent oil and gas firms, multinational oil and gas producing and servicing firms, upstream, midstream and downstream oil and gas services sectors, upstream (exploration and production), midstream (transportation) and downstream (refining, distribution and marketing) sectors of the oil and gas industry for a more holistic insight of strategic entrepreneurship engagements in the entire industry value chain in Nigeria.

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